



LIBRARY AND INFORMATION SCIENCE EDUCATION AND TRAINING IN ZIMBABWE AND THE PARADIGM SHIFT IN THE INFORMATION INDUSTRY

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(Information Studies) in the School of Social Sciences College of Humanities, University of
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Submitted: October 2014

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ABSTRACT

The purpose of this study was to assess LIS education and training in Zimbabwe in the context of paradigm shift in the information industry and how the indicators of change, mostly at the global level, reflect the interplay of these factors in Zimbabwe. The study was informed by the post positivist paradigm which allows methodological pluralism. Both qualitative and quantitative methodologies were used to inform the research design and data collection processes. The qualitative perspective was dominant, complemented by the quantitative. The strategy of inquiry combined both the case study and survey research designs. Respondents in the five study cases were surveyed using questionnaires and in-depth interviews. Documentary review was also used to collect data on LIS curricula in Zimbabwe. An integrated theoretical framework consisting of: Diffusion of Innovation (DOI) by Rogers (1995) and Punctuated Equilibrium Theory by Tushman and Romanelli (1985) informed the study. The findings of the study revealed that LIS education and training in Zimbabwe is changing as mirrored in the changing goals; core competencies encapsulated in the curricula; employability skill sets required in the labour market; ICT integration in the curricula; and resources required for delivering the curricula. However, the transitory nature of the information environment and the inadequacies in both human and physical resources have been major obstacles to the transition process resulting in theory/practice gaps and supply and demand disjuncture between what is taught in LIS education programmes and what is expected in the labour environments. This has resulted in criticism by LIS employers that LIS graduates were not industry ready. The study concluded that LIS education and training programmes need to close the theory/practice and demand/supply gap. This call for intensive curriculum overhaul and paradigm shift in models of teaching and learning in LIS education and training. The findings of this study raise awareness of the issues obstructing radical transformations in LIS education and training in Zimbabwe. The study also provides policy makers with evidence based information that is critical for analysis, advocacy, forecasting and strategic planning for LIS education and training reforms. Further research needs to be done on the possibility of establishing specialized LIS professional tracks in the curriculum such as health informatics, law and school librarianship and knowledge management to meet the needs of the labour market and ease the congestion of core competencies in the curricula. The study recommended that LIS education and training programmes invest in the requisite

resources, faculty capacity and build mutual linkages with LIS practitioners in collaborative teaching to offset the challenges of resource inadequacies and capacity.

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DEDICATION

“The humble He guides in justice and the humble He teaches His way”. Psalm 25:9

The thesis is dedicated to the loving memory of my parents Nyota Katuli and Swaibu Katuli who passed on during the course of my studies. Thank you mama for being a source of encouragement and inspiration and for instilling the importance of hard work in things I aspire to achieve. I also dedicate the work to my husband Isaiah Munyoro, our children Tatenda, Soserai and Kudzai for their patience, encouragement and unwavering support throughout the period of my study. I greatly appreciate you all.

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LIST OF ABBREVIATIONS AND ACRONYMS

AACR2	Anglo-American Cataloguing Rules 2 nd ed.
AHRQ	Agency for Healthcare Research and Quality
ALA	American Library Association
ASERL	Association of Southeastern Research Libraries
CILIP	Chartered Institute of Library and Information Professionals
COLAZ	College Lecturer Association of Zimbabwe
CPD	Continued Professional Development
CPDWL	Continued Professional Development and Workplace Learning
DDC	Dewey decimal classification
DOI	Diffusion of Innovation
EUCLID	European Curriculum Reflections of LIS Education
ICT	Information and Communication Technology
IFLA	Federation of Library Associations and Institutions
GeSCI	Global e-Schools and Communities Initiative
HE	Higher Education
HEIs	Higher Education Institutions
HEXCO	Higher Education Examinations Council
HND	Higher National Diploma
JICA	Japan International Cooperation Agency
KALIPER	Kellogg-ALISE Information Profession and Education Reform Project
LC	Library of Congress

NAMACO	National Manpower Advisory Council
NECF	the National Economic Consultative Forum
NC	National Certificate
ND	National Diploma
NECF	National Economic Consultative Forum
NORAD	Norwegian Agency for International Development
NQF	National Qualifications Framework
NUST	National University of Science and Technology
OECD	Organization for Economic Cooperation and Development
PKSB	Professional Knowledge and Skills Base
RAM	Records and Archive Management
R&D	Research and Development
SCANS	Secretary's Commission on Achieving Necessary Skills
SADC	Sothern African Development Community
SARUA	Southern African Regional Universities Association
SCESCAL	Standing Conference of Eastern, Central, and Southern Africa Library and Information Associations
SLA	Special Libraries Association
SPSS	Statistical Package for Social Science
TVET	Technical Vocational Education and Training
UNESCO	United Nations Educational, Scientific and Cultural Organization
ZOU	Zimbabwe Open University
ZIMCHE	Zimbabwe Council for Higher Education

ZIMDEF	Zimbabwe Manpower Development Fund
ZimLA	Zimbabwe Library Association
ZOSS	Zimbabwe Occupational Standards Service

CHAPTER ONE

INTRODUCTION

1.1 Background and context of the study

The purpose of this chapter is to provide a foundational base for the study, grounding the study in its context, theoretical principles, research paradigms, and methodologies. It also provides rationale for undertaking the study. The study is motivated by paradigm shifts in the information environment and their implications for LIS education and training. These paradigm shifts have given impetus to revolutionary transformation in LIS education and training.

This introductory chapter is therefore, divided into twelf sections. Section 1.2 provides an overview of the development of LIS education and training in Zimbabwe. Section 1.3 describes the statement of the problem and 1.4 illuminates the purpose of the study, while 1.5 outlines the the objectives of the study, 1.6 enumerates the specific research questions guiding the study. Section 1.6 delineates the delimitations of the study and section 1.7 provides a succinct exposition of extant empirical and theoretical literature on the subject of the study, contained in books, journals, databases for example. Section 1.8 underpins the study in the relevant theoretical frameworks. Section 1.9 describes the methodological issues of the study and 1.10 outlines the structure of the thesis. The summary of the chapter is presented in section 1.11.

The world is in the midst of radical transformative changes brought about by paradigm shifts in society, from focusing on labor as in the agricultural era or capital as in the industrial era to knowledge as a critical resource for socio-economic development (Macionis and Geber, 2010; Maurice, 2012). This economic paradigm shift coupled with advanced developments in technologies brought with it new methods of communication, modes of scholarly publishing, entertainment, information seeking habits, and information dissemination. The shifts are characterized by revolutionary transformations, information

explosion and overload, competitiveness, uncertainty and transitory changes (Bell, 1974; Cameron and Ulrich, 1986).

Advanced developments in ICTs revolutionized societal cultural conversational tools from being predominantly print-based to electronic-based (Eisenhardt and Schoonhoven, 1996). Macionis and Geber (2010) confirmed that societal cultural conversational tools have evolved to digital and mobile interfaces where instant messaging, internet forums, emailing, blogging and social networking are the norm. This has revolutionized communication habits of the society, modes of information production, dissemination and information seeking behavior.

The evolution of the information industry is inexorably interlinked to societal communication technologies of the time (McKendrick, 2012; Macionis and Geber, 2010; Deegan and Tanner 2002). Therefore, developments in communication technologies have triggered co-evolution in the information industry, such as the publishing industry and library and information science. For example, in the 1990s, journal publishers launched the digital platform content to disseminate their journal contents ubiquitously (Woodward, Rowland, McKnight, Meadows, Pritchett, 1997). Many print based versions were discontinued in favor of web-accessible versions (Roadman, 2012) to offset printing and distribution costs. The book industry and reference publishers followed suit, publishing in both print and digital formats. Audio-books and eBooks became easily available on the market (Roadman, 2012) and free digital dictionaries and encyclopedias became prevalent and popular with users (Deegan and Tanner, 2002).

Newspaper publishers started publishing on web sites, blogs and web feeds (Roadman, 2012). Some of these information sources were created digital. This therefore, revolutionized the economy and culture of the publishing industry (Bolter, 1991). The shifts in the landscape of publishing were summed up by Arthur Sulzberger Jr., the publisher and chair of the New York Times newspaper and company, noting that:

~~—~~We will follow our readers where they take us. If they want us in print, we will be there in print. If they want us on the web, we will be there on the web. If they want us on cell phones or downloaded so they can hear us in audio, we must be there. At the end of the day, it is the audience we

collect and the quality of that audience that is the critical factor, not the means by which we collect” (Roadman, 2012:99).

Thus, the interplay of paradigm shifts in society and specifically in the publishing industry was also apparent in the LIS profession and its academic discipline. Deegan and Tanner (2002) asserted that the LIS profession and its academic discipline have always responded to perceived environmental demands. They further noted that the current societal and technological shifts have brought unprecedented revolutions in the world of recorded information and communication. The shifts in the world of recorded information and communication have therefore, fundamentally revolutionized the structure, nature, mission, practice, and services of libraries as well as the landscape in which they operate in (Mckendrick, 2012). These shifts are structural in nature as they have revolutionized long-standing sets of practices, definitions, technologies, standards, tasks, principles and skill sets required to accomplish professional tasks in the LIS profession (Becher and Trowler, 2001). LIS professionals are called to “explore, develop, and implement new models, new skills and attitudes, new metrics, new ways of looking at old problems, and new approaches for new problems” (Mathews, 2014:22).

Mathews (2014) assertions are exemplified through LIS professionals extending their presence to reach cyberspace where they are collaborating and linking local libraries at the regional, national and even global levels; placing full content of institutional scholarly resources online for public access; publishing information about the library and archival resources; creating vibrant and interactive library websites that link the library holdings and its users; placing finding aids online; creating online Information Literacy Skills (ILS) tutorials; and offering reference services via emails, text messaging and mobile interfaces (Campbell, 2006 and Whalen and Costello, 2002). As a result, LIS professionals became “system designers, knowledge managers, web designers and administrators, educators, problem solvers, navigators and publishers” (Huckle and Watson, 2007:340 and Campbell, 2006); technology officers, project managers, data administrators, data curators data modelers, data architects web librarians, digital librarians, cyber librarians, information scientists, and knowledge analysts (Ugwuanyi and Ezema, 2010).

The knowledge economy coupled with advanced developments in ICTs broadened LIS labour environments beyond libraries (Lynch and Smith, 2001; Kennan, Willard and Wilson, 2006). The burgeoning information industry provides unlimited opportunities for individuals with information skills (Muddiman, 1995). More non-traditional LIS jobs are available on the LIS labour market (Synman (2000). This led Cronin (1995) to declare that beyond the traditional LIS labor market there is growing demand for LIS professionals with applied information and ICT skills.

All these changes bear testimony to predictions by Bell (1973) and Toffler (1980) that each paradigm dictates the means of production, work organization, education systems and skills sets. Tanner and Tanner (1995) have noted that paradigms serving society dictate what is expected of its educational systems and the core competencies of professions serving society. Empirical evidence in America revealed that the contemporary knowledge economy driven by technological developments requires a workforce equipped with:

(1) interpersonal skills: ability to participate as a team member, train others, service clients, exercise leadership, negotiate and work with diversity (2) information skills: ability to acquire, evaluate and add value to information (3) technology skills: select technology, apply technology to tasks, maintain and trouble shoot equipment (4) systems skills: understand systems, improve or design systems, monitor and correct performance (5) resources skills: identify, organize, plan and allocate resources (6) personal attributes: self esteem, sociability, self management, integrity, honest (7) thinking skills: thinking creatively, making decisions, solving problems, visualizing, knowing how to learn and reason (8) basic skills: reading, writing, performing arithmetic and mathematical operations, listening and communication (SCANS Report for America, 2000:xvii-xviii).

Most of the skills identified in the SCANS Report for America (2000) were outside the boundaries of “what a university education all-too-often provides” (Barber, Donnelly and Rizvi, 2013:12). This brought a major disjuncture between what the labor market is demanding and what is supplied. Therefore Higher Education (HE) goals and missions have become detached from the needs of the labor markets. This was demonstrated in media reports which are “imbued with reports of high rates of graduate’s unemployment, yet, ironically, there are a lot of unfilled vacancies due to unavailability of the sought-after competencies on the labor market” (McKendrick, 2012:5).

Therefore, the disjuncture between supply and demand prompted employers to question the relevance of the skills and competencies provided by institutions of higher learning (Million+ London Economics, 2013). The disconnections between what is provided and what is required in the labor market and echoes of disgruntlement among employers are also perceptible in LIS education and training globally. Anderson (2007) reported that LIS graduates in Australia were criticized for lacking the requisite skills to perform right away in their first jobs. The same reproach manifested also in America (Moran and Marchionini, 2012); in India (Singh, 2003); in Africa (Rukwaro, 1998 and Thapisa, 1999). In Zimbabwe, Nziramasanga (1999) also noted that Higher Education Institutions (HEIs) (Technical Vocational Education and Training (TVET) institutions and Universities) were failing to adequately prepare graduates for the contemporary work environment.

Furthermore, the increasing dominance of information/knowledge as a critical economic resource has attracted new competitors in education and training of information professionals from disciplines such as business management, computer science and information systems (Raju, 2013; Barthorpe, 2012; Galvin, 1995). LIS employers are therefore turning to these disciplines to satisfy their requirements of recruiting information professional with ICT and information related competencies (Barthorpe, 2012). A critical study by Siddiqui and Walia (2013) reported that LIS graduates were dissatisfied with the skills they received from LIS education and training programmes in terms of their relevance and application to work environments. These contentions brought the viability and relevancy of LIS education and training programmes globally into disrepute and the concerns pervaded scholarly discourse and literature. Cortez, Dutta and Kazlaaskas (2004) counsel that what is being taught in LIS departments is not enough. White (1986) recommended that LIS education programmes should take a sufficiently broad view of what is and will be expected of the information professionals in the increasingly complex information environment. Prasher (2001); Cortez, Dutta and Kazlaaskas (2004); and White (1986) concurred that education and training for LIS professionals needs to be aligned to perceived environmental demands. Rosado (1997) asserted that LIS education and training is defeated if it is irrelevant to the requirements of the industry it is meant to serve.

Therefore, the disjuncture between theory and practice, supply and demand and the concerns expressed in literature, signified a major problem in LIS education and training. Moreover, lessons drawn from the demise of the music industry in the 1990s showed that the industry

failed to heed the calls of concern from its fans and paid little attention to the fundamental changes in the industry at that point in time and the results proved disastrous for the music industry (Hanson-dePaula, 2013; Bailey, 2013; Raustiala and Sprigman, 2012). This motivated the researcher to also explore the issue of LIS education and training programmes being accused of not producing industry ready graduates.

1.2 Overview of the development of LIS education and training in Zimbabwe

LIS education and training in Zimbabwe ~~was~~ from its inception influenced by the British patterns of LIS education, and subsequently yielded to American influences" (Hikwa, 1990:20). From its inception, the mode of training for LIS workers in Zimbabwe was through an in-service training programme conducted by the then Government Library Service at a non- professional level (Powell, 1994). Later this programme was developed into a City and Guilds certificate (Wise, 1985). The City and Guilds certificate programme was heavily influenced by the British perspectives as the colonial settler government recruited British expatriate librarians to work as librarians as well as to teach the City and Guilds course. The examinations were set and marked in London and graduates were awarded the City and Guilds of London Institute Certificates in library assistance (Wise, 1985:52).

The Greenfield Commission report (1970) noted that the education of librarians is indispensable to library services in Zimbabwe (Greenfield, 1970). The report found that "... that correspondence courses did not meet the requisite needs since education for librarianship should be in line with the specific requirements of the country; (and recommended that a local) library or college should initiate such a form of education by way of vacation courses; and that the education for librarianship should eventually be conducted by a university or college, which might avail itself of British correspondence courses in the initial stage" (Greenfield, 1970: 42). The Greenfield Commission report recommendations were not immediately adopted but only implemented five years after the country's independence in 1980.

Edward Dudley of the Polytechnic of North London was commissioned to carry out a feasibility study on the prospects of introducing a full-time programme for training librarians in Zimbabwe (Kotei, 1984). The Dudley proposal for establishing a full time course in Library and Information Science at Harare Polytechnic was well received by all stakeholders

(Kotei, 1984). In 1985 the National Library and Documentation Services (NLDS) Act was enacted to provide the legal basis for the development of libraries and library education in Zimbabwe. The British Council provided support leading to the establishment of the first library school in Zimbabwe in 1985 (Thorpe, 1988) at the Harare Polytechnic and later at the Bulawayo Polytechnic (Powel, 1994). Students were taught by expatriates, volunteer professional librarians on a day-release basis. The programme was studied over one year and has since 1985 been replaced by the National Certificate (NC) (Hikwa, 1990).

Over the years, LIS education and training in Zimbabwe has expanded to other polytechnics for example Mutare, and Joshua Mqabuko Nkomo Polytechnic colleges (Hikwa, 1990, 2010). Polytechnics offer three levels of qualifications (Hikwa, 2010), namely the National Certificate in Library and Information Science (a one year long programme that prepares candidates for basic assistance in library and information practice); the National Diploma in Library and Information Science (a three-year long programme that prepares candidates for paraprofessional engagement in library and information practice); and the Higher National Diploma in Library and Information Science (a year-long programme that prepares candidates for all kinds of semi-professional work in library and information practice).

In 2000 LIS education and training in Zimbabwe diffused to university level. The first university to offer an undergraduate degree in LIS and Records and Archive Management (RAM) in Zimbabwe was the National University of Science and Technology (NUST). NUST offers three levels of qualifications that include (Hikwa, 2010): a Bachelor of Science Honors Degree in Library and Information Science (a four-year long programme that prepares candidates for professional work); post graduate diploma (an 18 month programme that prepares graduates who wish to join the LIS profession, having acquired a first honours degree in other disciplines); a Master's of Science degree in Library Science (a two year programme that prepares candidates for managerial work or teaching); and a doctor of philosophy degree in LIS (a three to five year programme that prepares LIS administrators, academics and researchers).

The Zimbabwe Open University (ZOU) started offering undergraduate degrees in both LIS and RAM- through distance education in 2009. Both Harare and Bulawayo Polytechnic are expected to offer a Bachelor of Technology degree in library and information science in partnership with NUST. In 1999, the Report of the Presidential Commission of Inquiry into

Education and Training reinforces the assertions in literature that higher and tertiary educational systems in Zimbabwe were unable to produce graduates whose skills and competencies are relevant to their specific field of work (Nzirasanga, 1999).

1.3 Statement of problem

Findings from a series of empirical studies by Anderson (2007); Hallam (2006); Myburgh (2003) and Harvey (2001) in Australia, have shown that LIS education programmes have been criticized for producing graduates without the requisite skills to function in their first job. In the United States of America, Moran and Marchionini (2012) and Stoffle and Leeder (2005) asserted that LIS education programmes have been reproached for failing to meet the immediate needs and requirements of the current LIS work environments. Singh (2003) in India observed that graduates and post graduates produced by LIS schools were challenged in terms of ICT skills and competencies, confidence to interact with information technology specialists and evaluate ICTs applications requisite for service delivery. In South Africa, Raju (2013); Minishi-Majanja (2004); in Botswana, Thapisa (1999); and in Kenya, Kavulya, (2007) and Rukwaro (1998:13) in their studies reaffirmed the frequently noted concern among LIS employers that “...LIS university graduates were not well suited or prepared for the job market...”

In Zimbabwe, Nzirasanga (1999) reported that graduates being produced in HE were inadequately prepared for the contemporary labor requirements. Chikonzo (2013) study assessing the changing needs of information professionals in Zimbabwe substantiated the assertions in literature that LIS graduates were not adequately prepared to fulfill their roles and responsibilities as expected.

The concerns why LIS graduates were purportedly reproached for being inadequately prepared for the jobs they apply for, although highly debated in scholarly discourse and literature, has remained an under researched topic in LIS education and training. Furthermore, the magnitude of the alleged criticism has become a cause of concern in LIS education and training. Therefore there is an urgent need for in-depth empirical study to examine why LIS graduates are often accused of being inadequately prepared for their jobs. This study offers a discourse on why LIS graduates are purportedly criticized for not being industry ready as attested in various empirical studies. Furthermore, the criticisms coupled

with fundamental changes in the profession and the society signify that LIS education and training programmes have not measured up to their perceived purpose or pact with society for producing skilled human capital for the LIS profession and industry. If the problem under study is not addressed, LIS education will continue to stray from its principal mission. Therefore the existing disjuncture between LIS education and training and LIS labor environments will continue to widen. In the same manner, if the problem under study is not addressed, rival disciplines like business management, and computer science and information systems may oust LIS education and training from its established cognitive domain.

This suggests that the survival and relevance of the LIS academic discipline is under threat. There is, therefore, the need to undertake this study to highlight the issues bedeviling LIS education and training. This scholarly discourse and literature creates awareness, stimulates debate and advocates for deep-seated transformations in LIS education and training. The central argument of the study is that LIS education and training need to fundamentally change in line with the changes in society, the profession and HE. Deep rooted changes cannot be accomplished in the fragmentary fashion currently adopted by LIS education programmes in Zimbabwe. LIS education and training programmes need to re-engineer, and failure to do so might result in LIS education and training losing its relevance in society (Sutton, 1999; Van House and Sutton, 1996).

1.4 Purpose of the study

The purpose of the study was to assess LIS education and training in Zimbabwe in the context of the paradigm shift in the information industry and to assess how the indicators of change, mostly at the global level, reflect the interplay of these factors in Zimbabwe.

1.5 Objectives of the study

The objectives of the study are:

1. To determine the changes in the LIS profession and its academic discipline.
2. To assess awareness and attitudes of LIS faculty regarding the changes.

1.6 Research questions

This study was guided by the following specific research questions:

1. What are the goals of LIS education and training in Zimbabwe?
2. What competencies are encapsulated in LIS curriculum?
3. What LIS skills are needed by the information industry?
4. What is the extent of ICT integration in the LIS curriculum?
5. What human and physical resources are available for delivering LIS curriculum?
6. What is the level of awareness by LIS faculty regarding paradigm shifts in the information industry?
7. What are the attitudes of LIS academics towards the changes in the information industry?

The study used research questions instead of hypotheses as recommended by Creswell (2008:29) who suggested that “in a qualitative study, inquirers state research questions, not hypotheses (i.e., predictions that involve variables and statistical tests)”. This view is also espoused by Coutin (2006) who asserts that qualitative research often attempts to answer a question rather than to test a hypothesis. He further argues that instead of devising ‘test conditions’, qualitative researchers examine ongoing social processes, study records of artifacts that shape or are produced by these processes, and talk to people who are engaged in or affected by the process being studied. This study therefore sought to understand LIS education and training issues, based on building complex, holistic pictures, formed with words, reporting detailed views of informants, and conducted in a natural setting (Creswell, 1994) rather than testing hypothesis.

1.7 Delimitation of the study

The study was limited to public Higher Education Institutions (HEIs) offering LIS education and training programmes in Zimbabwe. This comprises two universities (NUST and ZOU) and three polytechnic colleges (Harare, Bulawayo and Joshua Mqabuko Nkomo). The five institutions are the major providers of LIS education and training in Zimbabwe. These institutions are approved, regulated, funded, and accredited by government agencies. They are considered as the main sources of skilled human capital development in the LIS profession and are commonly accepted as gauges of LIS education and training by the general public and employers in Zimbabwe. The focus on public institutions offering LIS education and training provided the best available cases on which LIS education and training can be evaluated. The study is dominantly qualitative and used the purposive sampling technique. The results may not therefore, be widely generalized. Furthermore, respondents

especially the teaching staff, showed apathy in completing questionnaires and granting interviews. This could be attributed to survey fatigue or just lack of interest. However, the researcher was persistent and interviews were granted and several follow up were done before the questionnaires were completed and returned.

1.8 Preliminary literature review

The revolutionary transformations in the wider society, advanced development in ICTs, coupled with the mass closure of library schools experienced from the late 1980s to the early 1990s in America, was a cause of concern in the LIS field. LIS scholarly discourse and literature were imbued with echoes of concerns: where are we heading (Hallam, 2004; Wilson, 2013); there is a crisis in LIS (Ribeiro, 2008); wither library education (Gorman, 2004); whatever happened to the library schools (Feather, 2003). The American Library Association (ALA) heeded the calls of concern from the LIS fraternity, commissioned Kellogg-ALISE Information Profession and Education Reform Project (KALIPER) to examine the state of Library and Information Science education in America (KALIPER Report, 2000). The KALIPER study found that LIS education had transformed, in response to the demands of the information society and technological developments (KALIPER Report, 2000). Six major trends in LIS education were identified:

- 1) LIS professional education was focusing on broad-based information environments and information problems;
- 2) Diverse multi-disciplinary perspectives have been incorporated in the curricula;
- 3) Educational programmes have become predominantly user-centered;
- 4) Heavy investments in ICT infrastructure and infusion of ICT in LIS curricula were observable;
- 5) Specialized components have been integrated within the LIS curriculum;
- 6) LIS students were provided with flexible options of study and ICT related degrees at undergraduate, masters and doctoral levels have been introduced” (Durrance, 2004:6-9).

Heim (1986); Borko (1984); and MacGrigor (2011) emphasized that the traditional functions of HEIs were teaching and learning, community engagement/public policy and research. Heim (1986) and Cheng (2001a) observed that the traditional aspirations of HEIs and particularly LIS education programmes were changing in pursuit of new visions and goals.

Findings from a series of empirical studies Ur Rehman (2008); Hallam (2008); Gerolimos (2009); Myburgh (2010); Sacchanand (2012) have shown that LIS education programmes have integrated a diverse array of ICT, information related, and other supportive competencies in the curricula in response to broadened work environments, advanced developments in ICT and the information paradigm. Prebor (2010) and (Chu, 2006) observed that LIS education programmes have integrated courses ranging from computer sciences, education, communication and media studies, business management, technology, sociology and anthropology, psychology, political science, information systems, natural sciences and law. This prompted Chu (2006); Rehman (2008); Raju (2009); Myburgh (2010) and Mutula (2011) to assert that LIS education curricula have become noticeably inter-disciplinary making it extremely difficult to be precise about what constitutes core knowledge.

In addition, evidence from empirical studies undertaken by Myburgh(2010); Rehman (2008); Kennan, Willard and Wilson, (2006) revealed that LIS employers valued interpersonal skills, behavioral characteristics and transferable generic skills previously not taught in LIS education programmes. The studies identified a mismatch between what LIS education programmes provide and what is required in the LIS labour market. Minishi-Majanja (2007) reviewing ICT integration efforts in LIS curricula observed that LIS schools in Sub-Saharan Africa have incorporated diverse ICT modules in the curricula. Ocholla (2003) investigated the status of ICT in selected LIS departments in Eastern and Southern African countries and observed that ICT integration initiatives were challenged as a result of resource inadequacies. Meanwhile, Prakash (2009) observed that change in the LIS profession is embraced enthusiastically by some while others resist as it is difficult to break way from previously held notions and beliefs. This signifies a paradigm shift in the LIS field and its education and training. Kuhn (1996:x) defines paradigms as ~~un~~universally recognized scientific achievements that, for a time, provide model problems and solutions for a community of researchers. Paradigm shift means a sudden change in these universally recognized scientific achievements, models, notions and beliefs. A detailed review of literature is provided in chapter 3.

1.9 Principal theories

A number of theories have been developed to understand, explain and predict change processes, for example Rogers (1995) Diffusion of Innovations (DOI); Ely's (1990)

conditions for change; Punctuated Equilibrium Theory by Eldredge and Gould (1972); Tushman and Romanelli (1985); Gersick (1991); Fullan's Educational Change Model (1991a); System of Profession Theory by Abbott (1988); and Theory of Practice by Bourdieu (1977b). These change theories have been used as frameworks of inquiry in diverse disciplines such as education, policy, psychology, agriculture, health sciences, information sciences and organization studies. They have been empirically tested and found to be suitable and reliable for studying change processes. However, all these theories were comprehensively reviewed and Diffusion of Innovation Theory (DOI) by Rogers (1995) and Punctuated Equilibrium Theory by Tushman and Romanelli (1985) were selected as the appropriate theoretical lens for the study. The theories are extensively discussed in chapter 2 of this study.

The DOI by Rogers (1995) and Punctuated Equilibrium Theory by Tushman and Romanelli (1985) were selected primarily for their ability to address multifaceted and elusive problems. The problem under study: “why LIS graduates were purportedly accused of not being industry ready” is multifaceted and elusive. An integrative theoretical approach was deemed necessary for the study. The DOI and Punctuated Equilibrium Theory were integrated in a single study to provide a holistic theoretical framework to understand, explain and predict revolutionary transformations in LIS education and training. Ely (1978:152) recommends the use of integrative theoretical approaches in studying change processes, stating that “it is difficult to discuss change in linear, empirically-based paradigm” (Ely, 1978:152). The integrative theoretical framework therefore, enabled the study to move beyond the norm of adoption and non adoption dichotomous measure typical of diffusion studies (Zhu, Dong, Xu and Kraemer, 2006). It also facilitated methodological pluralism; and encouraged system thinking that is crucial in the LIS field (Knuth, 1997). Likewise, the integration of the two theories improved the explanatory power of the theories. It also provided a rare opportunity in change discourse to discuss two distinct types of change, evolutionary and revolutionary, jointly.

1.10 Research methodology and methods

The study was informed by the post positivist paradigm. A paradigm is a set of assumptions, concepts, values and practices that constitutes a view of reality (McGregor and Murnane,

2010; Krauss, 2005; Cohen, 2006). The post positivism paradigm represents the thinking after positivism, challenging the traditional notion of the absolute truth of knowledge (Phillips and Burbules, 2000) and postulating that there are many ways of knowing reality apart from the scientific methods (Cohen, Manion and Morrison, 2006; Krauss, 2005, Cohen, 2006). Pickard (2007) and McGregor and Murnane (2010) assert that each research paradigm is accompanied by its attendant methodologies. Both qualitative and quantitative methods are within the confines of the post positivism paradigm. The qualitative approach was dominant and the quantitative approach was complementary. The positivist framework provided the researcher with different levels of analysis qualitatively and quantitatively.

The study integrated case study and survey research methods within a single research design (Creswell, 2009). Respondents within the case study were surveyed using questionnaires and in-depth interviews. The case study and survey designs allow methodological pluralism (Creswell, 2009). Both the survey and the case study research methods are flexible enough to allow application of both qualitative and quantitative data production processes and analysis within a post positivism paradigm framework (Yin, 2003). The population of the study comprised the Deans/HODs, LIS faculty, LIS employers, and LIS final year students. The respondents were purposively selected in order to obtain the most productive data. The individuals chosen were knowledgeable, experienced and had genuine interests in the topic under study. They also made valuable contributions to this study. The purposive sampling technique allows the researcher to decide what needs to be known and find people with valuable knowledge and lived experiences on the subject under study (Bernard, 2002; Lewis and Sheppard, 2006; Hazeri, Martin and Sarrafzadeh, 2009). Merriam (2001) asserts that when the purposive sampling technique is used to collect data from people actually knowledgeable about the phenomenon, it results in acceptable outcomes.

This study utilized both in-depth interviews and questionnaires as primary techniques of data collection. The in-depth interview schedules and questionnaires were adapted from a previous study by Yu and Davis (2007). These questionnaires were also pretested to adapt the questions to the context of the study and corrections were done based on data received from the pretest. In-depth interviews provided the researcher with the means to collect context specific, deep insights and exhaustive data through interaction with respondents (McGregor and Murnane, 2010). The researcher managed to observe conscious and unconscious insights

about the subject through dialogue and in-depth interviews. This allowed the researcher to obtain insider perspectives and their embodied feelings about the subject under study (McGregor and Murnane, 2010; Boyce and Neale, 2006).

In-depth interviews were supplemented by self-administered questionnaires. The purpose of this was meant to investigate patterns, trends and attitudes as well as lived experiences among LIS faculty and final year students. Self-administered questionnaires were relatively cheap as data were easily collected from geographically dispersed respondents and extensive follow ups were conducted and the researcher managed to obtain a high response rate (Leedy and Ormond, 2005). Moreover, questionnaires produced standardized and anonymous data and coding and analysis was predetermined from the outset (Pickard, 2007). Document reviews were also used as a method of data production. All LIS curricula in Zimbabwe were interrogated based on preset questions. This data collection technique is flexible and therefore, easy to deal with large volumes of data; it was context-sensitive; respondents' bias was totally absent; and the technique went beyond impressionistic traits of interviews and questionnaires (Pickard, 2007).

Winter (1996) identified six ethical principles which should be addressed by the researcher before the study: (1) participants should be allowed to influence the work, (2) the wishes of those who do not wish to participate must be respected, (3) the development of the work must remain visible and open to suggestions from others, (4) permission must be obtained before making observations or examining documents produced for other purposes, (5) description of other's works and points of view must be negotiated with those concerned before being published, (6) the research must accept responsibility for maintaining confidentiality. Following Winter's (1996) principles, permission from the relevant authorities was sought before the study. Respondents were adequately notified of the purpose and procedures of the survey in advance. Participation was voluntary and respondents were free to decline participation at any stage of the data collection process. Respondents were asked to sign a consent form before the survey. Confidentiality and anonymity was assured through exclusion of participant's names and institutions in the research report. Data reported was coded to protect respondents' identity and privacy. The work was visible and open to suggestions from other members of the cohort group of which the researcher is a member; part of the work was also presented at the University of KwaZulu-Natal, College of Humanities Post Graduate Conference 2013 and the SCESCAL 2014 Conference in Malawi.

Qualitative data from the interviews and questionnaires were analyzed using Nvivo and quantitative data were analyzed using Statistical Package for Social Science (SPSS). Data were presented thematically as well as using descriptive statistics.

1.11 Structure of dissertation

The thesis is arranged into seven chapters.

Chapter One: Introduction and context of the study

The first chapter provided a short introductory basis of the research problem, specific research questions, theoretical framework, methodological approach adopted and the rationale for the study.

Chapter two: Theoretical framework

This section provides a critical review of the theoretical frameworks DOI and Punctuated Equilibrium Theory and their application to the study was justified.

Chapter three: Review of literature

This section presents a comprehensive review of the relevant literature based on the theoretical framework and six specific questions guiding the study.

Chapter four: Research methodology

The chapter discusses the post positivist paradigmatic underpinning the study. The survey research design was elaborated. The qualitative and quantitative methodological approaches and their attendant methods were comprehensively analyzed.

Chapter five: Data analysis and presentation

The section presents and analyzes the findings of the study based on the specific questions of the study, literature and theoretical constructs informing the study. Verbatim and descriptive statistics were used to present the findings.

Chapter six: Discussion of findings

Findings presented in chapter 5 were discussed thoroughly supported by literature, relevant theoretical constructs and practice.

Chapter seven: Summary of findings and conclusions

Research summaries and summary of the findings were outlined. The contribution of the study to theory, practice and policy were discussed. Conclusions and recommendations were drawn based on the results, literature and theories underpinning the study. Research gaps for further study were identified.

1.12 Summary

The purpose of this chapter was to introduce the study to the readers and highlight the components of the study discussed in chapters two to chapter seven. The key research variables were isolated from literature and theoretical frameworks of the study. The key research constructs were then positioned within the context of the study and the research problem. This was followed by the statement of the problem, the purpose of the study and a synopsis of the relevant literature. The specific questions of the study were outlined and the research design and the methods used were presented. The significance and delimitations of the study were highlighted. The structure of the whole thesis was outlined.

CHAPTER TWO

THEORETICAL FRAMEWORK

2.1 Introduction

This chapter reviews literature on two change theories underpinning this study: Diffusion of Innovation Theory (DOI) by (Rogers, 1995) and Punctuated Equilibrium Theory by (Tushman and Romanelli, 1985). The chapter discusses both the Diffusion of Innovation Theory and Punctuated Equilibrium Theory and gleans relevant variables which are used to generate a research model for this study. Empirical and theoretical literature significant to these theories is discussed and the relevance and limitations of both the Diffusion of Innovation Theory and Punctuated Equilibrium Theory are outlined. The chapter is divided into eight sections. Section 2.2 discusses the DOI theory; section 2.3 reviews the suitability of the DOI Theory to the study; section 2.4 outlines the limitations of the DOI Theory; section 2.5 reviews literature on the Punctuated Equilibrium Theory; section 2.6 discusses the suitability of the Punctuated Equilibrium Theory to the study; section 2.7 outlines the limitations of the Punctuated Equilibrium Theory; and section 2.8 provides the summary of the chapter.

There are four basic benefits of using theoretical frameworks in research studies. Theoretical frameworks (1) allow researchers to make prediction, (2) define research procedures in a systematic way, (3) empower researchers with explanatory power, and (4) allow the researchers to test and improve the applicability of the theory (Chigona and Licker, 2008). The theories informing this study were used as analytical tools in reviewing relevant literature, research methodologies and methods, data presenting, interpretations and discussions. The theories allowed the research to develop systematic research procedures, make predications, and provided the researcher with theoretical terms to explain and understand events in the study. Since the DOI and Punctuated Equilibrium Theories were developed for use in developed countries, use of these theories in Zimbabwe allowed the researcher to assess their applicability and outstanding abilities in a developing country.

This study sought to explore issues in LIS education and training in Zimbabwe and the paradigm shifts in the information industry. The study sought to address the following research questions:

- a) What are the goals of LIS education and training in Zimbabwe?
- b) What competencies are encapsulated in LIS curriculum?
- c) What LIS skills are needed by the information industry?
- d) What is the extent of information technology integration in the LIS curriculum?
- e) What human and physical resources are available for delivering LIS curriculum?
- f) What is the level of awareness by LIS faculty regarding paradigm shifts in the information industry?
- g) What are the attitudes of LIS academics towards the changes in the information industry?

2.2 Diffusion of Innovation Theory

The DOI theory centers on the conditions which stimulate or inhibit the likelihood of the dispersal of new ideas, products, or practices within a given social system (Rogers, 1995). Rogers (1995:35); Clarke (1999:1); Rogers and Scott (1997:4) defined diffusion as "the process by which an innovation is communicated through certain channels; over time among the members of a social system". Thus, the four constructs, innovation, communication channels, time, and social system expressed in the definition are the four key components of the Diffusion of Innovations Theory (Clarke, 1999:1; Rogers and Scott, 1997:4). Each element is crucial because it affects the rate of adoption of innovations (Rogers, 1995). The four elements that make up the DOI theory are each elaborated in sections 2.2.1 – 2.2.4

2.2.1 Innovation

An innovation is defined as any ~~new~~ idea, practice, or object considered new to an individual or other units of adoption" (Rogers, 1995:11). An individual's perception of the newness of an innovation influences its rate of adoption more than the actual time it has been around (Rogers, 1995). He further observes that newness can also mean new knowledge of the innovation or a new decision to adopt it. Larsen (1997:1) concurs with Rogers and points out that the computer may be considered as a new innovation within a social system even though it has been available to the public for decades. However, when an individual or members of a social system make a decision to adopt or use computers for the first time it

becomes an innovation. The adoption of innovations within a social system is a change process which alters the status quo of the social system and is therefore, likely to be received enthusiastically or resisted.

The advent of the information society driven by advanced developments in ICTs, specifically the World Wide Web, internet and instant communication interfaces, brought major structural shifts in the LIS field. These shifts brought deep-rooted changes to LIS practice, standards, principles and tasks. This generated uncertainty and anxiety in the LIS field. Echoes of concerns imbued LIS scholarly discourse. Pessimistic futurists like Lancaster (1999), Bell (1973), and Toffler (1981) predicted the demise of libraries and the LIS profession. They asserted that expert systems will displace the print-on-paper system and thus render both traditional libraries and librarians obsolete. Conversely, Harris and Hanna were optimistic. They predicted that “forward-looking and opportunistic information specialists,” will thrive in the “paperless society” by moving from the public sector “custodial” function to a private sector “entrepreneurial” role” (Harris and Hannah, 1993:39).

Harris and Hanna’s predications (1993) are noticeable in LIS education and training globally. LIS education programmes that envisioned opportunities from the innovations such as ICT and knowledge or information paradigm have repositioned their programmes and curricula in line with the perceived needs for the twenty-first century. Some radical LIS education programmes have decoupled almost entirely from the library heartland (the so-called I-schools in America, Europe, China, African are examples). I-schools are regarded as the radicals (the true believers in total change) (Berring, 1995). The I-schools consider the “old system of librarianship as a problem and feel that the entire template of librarianship must be discarded and a new reality for the profession created” (Berring, 1995:95). According to the DOI the I-schools are the innovators (Rogers, 1995).

Conversely, Berring (1995) stated that most LIS schools have embraced both the old and the new innovations sensibly by blending into a hybrid model of LIS education and training. These LIS schools are called reformers (Cronin, 1995; Berring, 1995) and, according to the DOI Theory, early adopters (Rogers, 1995). Likewise, there are LIS schools that have remained unchanged and hold on to the old system (Cronin, 1995; Berring, 1995). LIS schools in this group have been called conservatives (Cronin, 1995; Berring, 1995) and in DOI language, laggards (Rogers, 1995).

Conceptual and empirical research has shown that the change process is stimulated by facilitative conditions (Rogers, 2003 and Warford, 2005). Rogers (2003) posits that facilitative antecedents of innovations should be in place before diffusion of innovation can occur. He further asserts that antecedents of innovations encompass the availability of the innovation itself, easy flow of information about the innovation, ability to use the innovation, supportive infrastructure, innovation supportive culture and perceived environmental need of the innovation (Rogers, 2003 and Warford, 2005). The innovation antecedents play a critical role in the diffusion of innovations (Rogers, 2003). The fundamental innovation antecedents in LIS education and training include ICT infrastructure, funding, policy and regulatory frameworks, faculty and students ICT capacity, ICT resources, leadership support, innovation incentives and organizational culture promoting innovation.

2.2.2 Communication channels

The second element of the DOI theory is communication channels described as “the means by which a message gets from the source to the receiver” (Rogers, 2003:204). The DOI theory notes that social systems have established communication channels that are used to share information among its members. These channels of communication can be grouped into two: interpersonal or mass communication. Mass communication channels are described as means of transmitting messages through electronic or print media such as the radio, television and/or newspapers to reach a wide audience (Rogers, 1995). Interpersonal channels involve face-to-face exchange of information between two or more individuals (Rogers, 1995). The communication channels are considered to be the most effective way to raise awareness and influence individual adopters or a community of practice attitudes towards an innovation (Rogers, 2003).

Yates (2001) and Rogers (1995) stated that most individuals evaluate innovations not only on the basis of empirical evidence, but through subjective evaluations of peers who have prior knowledge of the innovation. This has been exemplified in LIS education and training where the development of LIS as an academic discipline started in Northern America through the Williamson Report of 1923. However, the innovation spread globally through communication channels such as visiting scholars, professional meetings, institutions and organizations partnerships, professional associations, through sharing of experiences, informally and

formally; group experiences in conferences and workshops, journals, formal education, advertisements, word of mouth, exchange programmes, newsletters, in-services, demonstration projects and the internet, until it pervaded the whole world (Carrol, Kerr, Musa, and Afzal, 2012 and Sarosa, 2012).

2.2.3 Time

The time dimension in the DOI theory is measured from the time when an individual or other decision-making unit gets to know of an innovation, forms an attitude toward the innovation, takes a decision to adopt or reject an innovation, implements the new idea, and finally confirms this decision (Rogers, 1995). Throughout the decision process, individuals or other decision-making units seek awareness- knowledge, how-to-knowledge and principle-knowledge about the innovation” (Rogers, 2003:21). Acquisition of the different types of knowledge about the innovation helps potential adopters to make informed decisions and form an opinion towards the innovations (Sarosa, 2012). This has been demonstrated in LIS discourse where scholars like Apostle and Raymond (1986); Ostler and Dahlin (1995) and Holmes (1983) developed favourable attitudes towards new innovations in the field. These scholars suggest that the new innovations have brought high status, prestige and esteem to the profession, and lessened the previous negative connotations associated with the LIS profession. On the other hand, scholars like Um and Feather (2007); Cronin (2002) and Gorman (2004) lamented that the innovations in LIS have decentered the traditional tenets of the profession as the study of information and ICT gained impetus.

2.2.4 The social system

Rogers (2003:23) defined a social system as “a set of interrelated units engaged in joint problem solving to accomplish common goals”. Innovations diffuse within the boundaries of a social system which have norms, values, standards, structure and objectives that glue member’s together (Rogers, 1995). The LIS profession and its academic discipline are social systems with their own defining values, standards, norms, and structure, ethos, long-standing sets of practices and aspirations that unify members. This assertion is reinforced further by Audunson (1999) when he stated that LIS education is an established academic field with its body of knowledge, expertise, theories, norms, rules, ethics, goals, structures and standards that define and prescribe appropriate professional behavior.

2.2.5 Perceived attributes

The DOI theory posits that the possibility that an innovation is adopted is subjective to its intrinsic attributes. The perceived attributes of an innovation are considered to be the most important characteristics for explaining and understanding adoption research (Rogers, 2003 and Pickett-Baker, 2011). In addition, Rogers (2003) asserts that the perceived attributes of an innovation provide powerful tools informing attitudes towards innovations, and attitudes are critical for understanding human behavior (Rogers, 2003). The five characteristics of innovations are: (1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, and (5) observability (Rogers, 2003).

2.2.6 Relative advantage

Rogers (2003:229) defined relative advantage as “the degree to which an innovation is perceived as being better than the idea it supersedes”. Innovations adopted in LIS are perceived as better than the ideas they have surpassed as they have transformed the very essence of the profession (Gorman, 2004); its services (Gerolimos, 2009); skills and competencies (Gordon, 2010); predetermined roles (Huckle and Watson, 2007); and long-standing sets of practices and standards (Rifkin, 1995). Furthermore, the emerging LIS labour market demands graduates with competencies in ICT (Miwa, 2006; Varalakshmi, 2007), with a broad based educational background (Huckle and Watson, 2007), multi-skilled, (Kovatcheva, 2011; Shannon, 2008). This has generated a perceived need to change the status quo of the LIS profession and its academic discipline. Thus, the decision to adopt and integrate new innovations such as ICT, multidisciplinary subjects and information related courses in LIS education and training are attempts to realign with the perceived environmental needs and demands of the contemporary information environment. These efforts are meant to facilitate the production of LIS graduates with requisite competences needed in the broadening and transitory LIS labor environments.

2.2.7 Compatibility

Rogers (2003:15) states that “compatibility is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters”. Hubbard and Sandmann (2007) describe compatibility as the degree to which practice is compatible with current objectives and philosophies. Thus, the more potential adopters perceive the innovations as compatible with their values, experiences or needs, the more

likely they will adopt it (Grunwald, 2002). Varalakshmi (2003); Myburgh (2005); Cronin (1995); Gerolimos (2009) stated that the changing mode of information production from mode one (print-based) to mode two (digital-based) has revolutionized the way information is generated, stored, acquired, accessed, retrieved, and communicated. This has compelled LIS education and training programmes to reform and reorient their curricula to align with perceived values, experiences and needs, the major purpose of which was to develop graduates with perceived environmental competencies, values, principles and experiences (Varalakshmi, 2003) and satisfy the requirements of accreditation procedures (Ur Rahman, 2012). Sahin (2006) asserts that even naming the innovation is an important part of compatibility. He further states that what the innovation is called should be clear and meaningful to potential adopters. This has been exemplified in the renaming of LIS education and training departments from ‘Library’ to ‘Information’ science/studies/management/communication/ and systems. Furthermore it is also demonstrated in job titles such as web librarian, data librarian, systems librarian, knowledge manager and information managers. The innovative naming system is part of compatibility to the new trends in the profession.

Hubbard and Sandmann (2007) argue that compatibility factors can be something as simple as not having the right resources to implement the practice. In less developed Asian countries such as Nepal, Bhutan and the Maldives, LIS education lags behind, as these countries lack their own teaching facilities and depend on other countries to train their LIS professionals (Singh and Wijetunge, 2006). Similarly African countries often lack resources, and have poor ICT infrastructure, inadequate internet connectivity, low levels of government support, weak research base, and lack of political will as well as expertise compatible with the environmental demands (Minishi-Majanja, 2004; Ocholla, 2000).

2.2.8 Complexity

Rogers (2003:15) defined complexity as “the degree to which an innovation is perceived as relatively difficult to understand and use”. Therefore, if the innovation is difficult to acquire access, learn, and use, the less likely it is adopted (Hubbard and Sandmann, 2007). ICT use in teaching and learning is not widely adopted because it requires enskilling of faculty, changing established teaching methods, and culture, and demands sustained long term investments in related ICT infrastructure and resources (Parisot, 1995). The inadequacies in terms of ICT infrastructure, resources, and capacity experienced in most LIS education and

training programmes in Africa (Minishi-Majanja and Ocholla, 2004) represent obstacles in the diffusion of ICT innovations.

2.2.9 Trialability

According to Rogers (2003:16), “trialability is the degree to which an innovation may be experimented on a limited basis”. Trialability allows the potential adopters the possibility of experimenting with the innovation and of modifying it to meet their needs (Orr, 2003). Distance education and open learning has been on trial for a long time in LIS education and training globally (Koehler and Blair, 2003). However, advanced developments in ICT and specifically the internet and the Web have pushed distance education in the form of digital scholarship to new frontiers (Bhatti and Ariff, 2006; Koehler and Blair, 2003). Digital scholarship has proved to be an alternative, flexible and less costly means of educating LIS graduates (Bhatti and Ariff, 2006).

2.2.10 Observability

Rogers (2003:16) defined observability as “the degree to which the results of an innovation are visible to others”. Thus, if potential adopters have the opportunity to observe the benefits of the innovations, they are motivated to adopt (Rogers, 2003). This suggests that role modeling (or peer observation) is a critical stimulus in adoption and diffusion of innovations (Parisot, 1997). Use of ICTs and specifically the web and instant messaging applications have been observed to provide unbound access to library services and resources. Similarly LIS professionals with the requisite digital competencies are highly sought after in work environments, have higher rates of job mobility, better chances of promotions, better remunerations, and higher opportunities for professional growth (Malhan and Rao, 2006; Apostle and Raymond, 1986; Ostler and Dahlin, 1995). These examples demonstrate observable results of ICT use and acquisition of ICT competencies required in the labor market.

2.3 Suitability of DOI to this study

Using the DOI framework, the researcher was able to conceptualize LIS education and training in Zimbabwe. This was used as the unit of analysis within larger organizations that

adopt or refrain from adopting innovations. DOI Theory provided the analytical lens to examine innovation and diffusion process in LIS education and training. This allowed the researcher to probe the innovation diffusion process in LIS education and training. In addition, it is used to analyze how the innovations are communicated within LIS education and training programmes. The DOI Theory is used further to examine innovation antecedents, innovations diffusion and consequences of innovations on individuals, groups, and LIS education and training programmes. The five attributes of the innovation (relative advantage, compatibility, complexity, trialability and observability) provided theoretical underpinnings under which the scope and the facilitative conditions of ICT integration could be understood (Rogers, 1995). Dooley (1999) and Ellsworth (2000) further stated that perceived attributes of innovations provide useful theoretical constructs to study and understand innovation implementation and evaluation.

Variables from the DIO Theory discussed in section 2.2.1-2.2.10 were used in this study as a theoretical lens for the following specific research questions: (4) what is the extent of information technology integration in the LIS curriculum? (6) What is the level of awareness by LIS faculty regarding paradigm shift in the information industry? (7) What are the attitudes of LIS academics towards the changes in the information industry? Sabouhi, Babaei, Naji and Zaden (2011) substantiated that knowledge enhances and influences attitudes of potential adopters, while Luce, Bettman and Payne (2000); Rogers (1995) asserted that perceived attributes of innovation are important theoretical constructs for explaining the rate of adoption of an innovation. In addition, potential adopters are persuaded to adopt an innovation if they are provided with the right information and its perceived benefits (Rogers, 2003). Ganter and Hecker (2013) assert that antecedents of innovations impact on organizations' likelihood to innovate.

2.4 Limitations of DOI for this study and way forward

The major limitation of the DOI theory is the bias that innovations are good and must be adopted (Grunwarld, 2002). Furthermore, the DOI inference that innovations are adopted mainly because of their intrinsic attributes is limited (Lyytinen and Damsgaard, 2001). Beynon-Davies and Williams (2003); Lyytinen and Damsgaard (2001) argued that the assertion that innovations are adopted because of their intrinsic value is limited, biased and does not take into consideration other factors. They further stated that potential adopters also

consider other factors outside the characteristics of an innovation when adopting innovations. In addition, Rogers' (1995) DOI Theory is limited to studying diffusion of innovation within a social system such as LIS education and training. The environment in which LIS education and training operates, is influenced and controlled by decisions and objectives made in other wider social systems such as the ministry of education or the larger university or college system in which it is part. In this set up, change does not happen in a linear manner as there are a lot of feedbacks and loops that need to be taken into consideration. In this regard the DOI Theory by Rogers (1995) falls short in providing comprehensive theoretical constructs for this study and the Punctuated Equilibrium Theory was used to strengthen the shortcomings of the DOI theory. This enabled the researcher to study the effects of innovation on the LIS profession and its academic discipline in Zimbabwe. The DOI variables relevant to this study are summarized in table 1.

Table 1: DOI variables applicable to the study

Specific research questions of the study informed by DOI	DOI variables relevant	Questions addressed in data collection instruments
4. What is the extent of information technology integration in the LIS curriculum?	Antecedents variable Relative advantage complexity Compatibility	Document review check list Q. 4 (Appendix 5) LIS faculty questionnaire Q. 4; 9 (Appendix 3) Dean/HOD interview schedule Q. 6 (Appendix 1)
6. What is the level of awareness by LIS faculty regarding paradigm shift in the information industry?	Awareness-knowledge	LIS faculty questionnaire Q. 1, 2; 9 (Appendix 3)
7. What are the attitudes of LIS academics towards the changes in the information industry?	Antecedents variable Compatibility	LIS faculty questionnaire Q.7, 9 (Appendix 3)

2.5 Punctuated Equilibrium Theory

The Punctuated Equilibrium Theory was first proposed by Eldridge and Gould (1972) in the natural sciences. In natural science species lineages change very little for most of the species histories, but sudden rapid environmental changes occasionally occur, disturbing the species tranquility and ecosystems (Eldridge and Gould, 1972). As a result of the sudden environmental changes, some species are separated from their ancestral relatives. The estranged species have two alternatives: to either adapt to the new environment and

ecosystem or die (Eldridge and Gould, 1972; Benton, 1993). The “species that adapt rapidly evolve into new species and compete for survival with their ancestral relatives” (Benton, 1993:33). The inferences in the theory have been noticeable in LIS education and training. The sudden environmental changes in the LIS field brought about by advanced developments in ICTs led some LIS schools to evolve into I-schools which are competing for survival with LIS schools.

Tushman and Romanelli (1985) applied Eldridge and Gould's (1972) Punctuated Equilibrium Theoretical constructs to study organization revolutions. Tushman and Romanelli (1985) hypothesized that organizations like biological species exist for a relatively long periods of equilibrium and in the midpoint they are suddenly punctuated with revolutionary changes. They further speculated that the punctuation occurs within a relatively short period of time, and organizational tranquility is quickly achieved (Tushman and Romanelli, 1985). Tushman and Romanelli (1985) used three constructs to explain the Punctuated Equilibrium Theory. The key constructs of the Punctuated Equilibrium Theory are equilibrium period, revolution period and deep structure; which are discussed in sections 2.5.1-2.5.3.

2.5.1 Equilibrium period

According to Tushman and Romanelli (1985) the equilibrium period is also called a convergent period (a relatively long time span of incremental change and adaption). In this equilibrium period, basic organizational activity patterns remain the same and the organizational deep structure is preserved (Tushman and O'Reilly, 1996). During the equilibrium period, incremental changes are made to compensate for internal and external environmental disturbances however: the changes have little impact on organizational deep structure (Tushman and O'Reilly, 1996). In equilibrium periods, organizations are internally consistent, have less competitive vigilance and inertia increases (Tushman and Romanelli, 1985). Fidler (1998) asserts that it is during equilibrium periods that organizations are likely to disregard signals which indicate the need for change. Deal and Kennedy (1982); Miller (1990) concurred that often it is when these signals have been ignored that the impetus for change is set. Deal and Kennedy (1982); Miller (1990) claim that when change is not envisioned and there is a sudden need to change, organizations are often likely to be thrown into turmoil.

The equilibrium period assumed in the Punctuated Equilibrium Theory has been observed in LIS education and training (Myburgh, 2005; Glazier, 2002). Since its inception by Melvil Dewey in 1887, LIS education and training has enjoyed long equilibrium periods with few incremental changes and adaptations to meet perceived environmental demands (Myburgh, 2005; 2000; Glazier, 2002). The study programme developed by Dewey in 1887 was based on applied skills (Myburgh, 2005). The curriculum emphasized four basic subjects: –ataloguing and classification; reference work (mainly focusing on reference interviews and reference sources); information retrieval; and information management” (Myburgh, 2000:130). The subjects were based on the daily routines and library procedures and the curriculum was clerical in nature and content (Myburgh, 2005; Biggs, 1995). Dewey’s paradigm of applied skills influenced LIS education and training globally for more than a century until it began to be questioned in the early 1980s after the closure of many LIS schools in America (Myburgh, 2005; 2000; Glazier, 2002).

The advent of the information paradigm driven by advanced development in ICTs has brought major punctuations to the equilibrium period in LIS education and training (Apostle and Raymond, 1986; Murphy, n.d). Ostler, Dahlin and Willardson (1995); Murphy, (n.d) declared that LIS schools in America disregarded the impact of the information paradigm driven by advanced developments in ICTs on the profession and this led to mass closure of LIS schools in America in the late 1970s to the 1980s (Saracevic, 1994; Ostler, Dahlin and Willardson, 1995). White (1995); Law (1989); Ostler, Dahlin and Willardson (1995) attributed the mass closure to inertia and low competitive vigilance.

2.5.2 Revolution periods

The variable revolution periods is defined as “brief intense periods of transformative changes” (Tushman and Romanelli, 1985:175). It is described using two elements (1) internal changes which represent the inability of the system to meet its own goals and demands based on its current design and (2) environmental changes which represent pressure on the system from the environment in which it operates (for example introduction of a new technology into the system and scarcity of both human and physical resources) (Tushman and Romanelli, 1985; Tushman and Anderson, 1986; Gersick, 1991). The Punctuated Equilibrium Theory states that there are two types of revolutions: reorientation and recreation (Tushman and O’Reilly, 1996). During reorientation, strategies, power, structure and systems are

fundamentally transformed. In times of reorientation, change is discontinuous. Pugh (2000:3) describes discontinuous change as “change that embraces a distinguished break with the past practice, and requires the recognition that the former ways of doing things will not create and sustain successful organizations”. He further argues that change during reorientation has no template based on previous experience, and there is no consensus about how change should be handled.

Recreations are reorientations which involve changes in core values and are regarded the most radical of revolutions (Tushman and Romanelli, 1985). Weick and Quinn (1999) assert that episodes of revolutionary recreations occur when there is a growing misalignment between an organization’s deep structure and espoused environmental demands. During the revolutionary periods an organization’s deep structure disassembles and undergoes wholesale transformations until a new deep structure is reconfigured (Tushman and O’Reilly, 1996). Throughout the revolutionary periods, organizational certainties which provide security during equilibrium periods are broken (Tushman and Romanelli, 1985). They further speculated that uncertainty about the future becomes the norm until a new basis around which to form a new deep structure is found. However, revolutionary periods end rapidly once a new deep structure is found (Tushman and O’Reilly, 1996).

Revolutionary assumptions predicted in the Punctuated Equilibrium Theory have been observed in LIS education and training. Advanced development in ICT and the increased dominance of knowledge as a critical economic resource brought revolutionary changes to the mode of information production, distribution, and storage (Roadman, 2012; Deegan and Tanner, 2002). This in turn revolutionized LIS education and training principles, standards, pedagogical methods and theories, technologies, practice and professional skill sets of the LIS profession (Hallam, 2008; Gerolimos, 2009; Myburgh, 2010; Sacchanand, 2012). In libraries, card catalogue cabinets have disappeared and computer terminal points providing access to library collections integrated with the resources of the World Wide Web have become common features (Whalen and Costello, 2002). Library collections are no longer limited to what the library owns but include licensed electronic resources some of which are not even owned by the library (Whalen and Costello, 2002).

LIS professionals have extended their services to reach cyberspace, linking local libraries at regional, national and international levels, and have broadened their outreach services beyond

the venerable book mobiles (Whalen and Costello, 2002). Libraries have been deinstitutionalized and library services are no longer bound geographically (Huckle and Watson, 2007). Librarians have evolved to become system managers, web designers, and web administrators, system developers, knowledge managers, trainers and publishers (Whalen and Costello, 2002; Huckle and Watson, 2007; Myburgh, 2010). LIS tenets, standards and definitions which informed, defined and guided the LIS professional template as well as provided professional security for the past century (equilibrium period) have disassembled and their relevance is being questioned (revolutionary) (White, 1995). The changes prompted scholars like Cortez, Dutta and Kazlauskas (2004) and White (1986) to question what is being taught in LIS education and training. This led Prasher (2001) and White (1986) to suggest that LIS education and training need major recreations and reorientations to realign with the dynamic contemporary information environment.

2.5.3 Deep structure

Tushman and O'Reilly (1996) assert that all organizations or professions have a deep structure (underlying order) which consists of core beliefs and values; products, markets, technology, and competitive timing; distribution of power; basic internal structure; and type of control systems. Gersick (1991:14) defines "deep structure" as "the set of fundamental "choices" a system has made of (1) the basic parts into which its units will be organized and (2) the basic activity patterns that will maintain its existence". It is the deep structure which limits organizational change during equilibrium (Gersick, 1991; Tushman and O'Reilly, 1996). Organizational deep structures can only be changed through major wholesale upheavals (Gersick, 1991; Romanelli and Tushman, 1994).

The deep structure can be explained using five facets: "(1) core beliefs and values regarding the organization, its employees and its environment; (2) strategy (products, markets, technology and competitive timing); (3) the distribution of power; (4) the organization's structure; and (5) the nature and type of pervasiveness of control system" (Gersick, 1991:14). The elements of the deep structure are mutually interdependent, and take a major revolution or paradigm shift to disassemble (Gersick, 1991; Tushman and Romanelli, 1985). "When a major revolution occurs the deep structure dismantles, leaving the organization's systems temporarily disorganized until a new deep structure which operates according to new sets of rules is configured" (Gersick, 1991:19).

The deep structure theorized in the Punctuated Equilibrium Theory by Tushman and Romanelli (1985) can be construed in LIS education and training. The LIS profession has an abstract body of knowledge (Um and Feather, 2007), consisting of standards, principles, theories, tools, vocabularies, values, ethics, culture, strategies, structures, power distribution and control systems (Um and Feather, 2007; Kuhlthau, 1993). These abstract bodies of knowledge forms the central tenets of the profession and distinguish the LIS profession from other information professions. It is these bodies of knowledge that is studied by those entering the profession (Um and Feather, 2007; Kuhlthau, 1993; Willard and Mychalyn, 1998). It is the mandate of LIS education and training programmes to inculcate those joining the profession with this deep structure (Veysey, 1965). Teaching and learning of the profession's deep structure legitimates the LIS profession to the general public, industry and the profession itself (Veysey, 1965). This is necessary to maintain professional relevance in society, industry and for professional growth, development and continuity.

Literature indicate that the LIS body of knowledge has expanded and the list of desirable traits, skills and competencies expected of those wishing to work in the LIS profession are in a state of continuous change (Cronin, 1985; Gorman and Corbitt, 2002; Barthorpe, 2012; Raju, 2013). This has created anxiety and uncertainty about what constitutes core competencies in LIS education and training. The transitory nature of LIS competencies and the concerns over the significance of LIS education (Cronin, 1985; Gorman, 2006; Barthorpe, 2012; Raju, 2013) is typical of a dismantled deep structure as inferred in the Punctuated Equilibrium Theory. The incorporation of new subjects in the curriculum such as ICT, information related subjects and other supportive subjects from business management, law, marketing, and entrepreneurship (Minishi-Majanja, 2009; Markey, 2004; Bathini, 2013; Subramaniam and Jaeger, 2011) signifies the emergence of a new underlying order in LIS education and training as deduced in the Punctuated Equilibrium Theory by Tushman and Romanelli (1985).

Several scholars in LIS have applied the ecology theory in their studies: for example, Van House and Sutton (1996) used the ecology theory in their study entitled "The panda syndrome: an ecology of LIS education" and Sutton (1999) used it in his study "the panda syndrome II: innovation, discontinuous change, and LIS education". Both studies examined

intermittent changes in LIS education and training due to diffusion of innovations. Studies by Van House and Sutton (1996) and Sutton (1999) underlined the need for change in LIS education and training programmes to align with perceived environmental demands and needs. Sutton (1999) confirmed that new innovations in the LIS field inevitably result in new knowledge, new practices and new skill sets that displace the old. Van House and Sutton (1996) concluded that LIS education and training programmes need to rapidly respond and prepare for the fundamental changes in the profession. Failure to change might result in LIS education and training programmes becoming obsolete (Sutton, 1999; Van House and Sutton, 1996).

2.6 Suitability of Punctuated Equilibrium Theory to this study

Punctuated Equilibrium Theory has been applied in many fields including policy, health sciences, education, and business organizations and has proved to be reliable in analyzing change processes (Gold, 1999). The theory provided an empirical framework to analyze practice-based organizational transformations (Eldridge and Gould, 1972). Punctuated Equilibrium Theory was used in this study as an analytical tool for understanding the issues facing LIS education and training in Zimbabwe in an environment where incremental adaptation appears to be unequal to the socio-economic, technological and environmental changes taking place (Halberstam, 1986 and Kennedy, 1987). The theory is further used to determine what is changing and to examine how the change process is managed in LIS education and training. In addition the theory is used as an analytical tool to assess stakeholder's perspectives about the changes taking place in the LIS profession and its academic discipline. The Punctuated Equilibrium Theory provided an analytical lens used in this study to understand, explain and predict the change process in LIS education and training. It also allowed the researcher to define and conduct the research in a systematic manner.

2.7 Limitations of the Punctuated Equilibrium Theory

The major drawback of the Punctuated Equilibrium Theory is the imagery path of revolution it suggests (Gersick, 1991; Tushman and Romanelli, 1985). Critics of the theory argue that the dynamics of institutional change are more complex than portrayed in the Punctuated Equilibrium Theory (Djeli and Quack, 2005b). Djeli and Quack further argued that

punctuated equilibrium reforms in different organizations or geographic regions cannot be considered uniform due to socio-economic factors (Djeli and Quack, 2005b). As a result, the study accounted for the different political, economic, social and technological factors when applying the Punctuated Equilibrium Theory in the Zimbabwean context. In addition the development and maturity of LIS education and training in Zimbabwe was also taken into consideration when contextualizing the Punctuated Equilibrium Theory. The Punctuated Equilibrium Theory variables relevant to this study are summarized in table 2.

Table 2: Punctuated Equilibrium Theory variables relevant to the study

Specific research questions of the study informed by the Punctuated Equilibrium Theory	Punctuated Equilibrium variables relevant	Questions addressed in data collection instruments
1. What are the goals of LIS education and training in Zimbabwe? 2. What competencies are encapsulated in LIS curriculum?	Deep structure <ul style="list-style-type: none"> • core beliefs • strategy • organizational structure • control system 	Dean/HOD interview schedule Q.3 (Appendix 1) Document review check list Q. 1; 2; 3; 4 (Appendix 5)
3. What LIS skills are needed by the information industry? 4. What human and physical resources are available for delivering LIS curriculum? 5. What is the extent of ICT integration in the LIS curriculum?	Revolution periods <ul style="list-style-type: none"> • Internal environmental change • External environmental changes 	LIS employers interview schedule Q. 3; 4 (Appendix 2); LIS graduates questionnaire Q. 3;4 (Appendix 4); Dean/HOD interview schedule Q.5 (Appendix 1); LIS faculty questionnaire schedule Q.3 (Appendix 3) LIS faculty questionnaire Q. 5; 6; 9 (Appendix 3); Dean/HOD interview schedule Q.6;7 (Appendix 1) LIS faculty questionnaire Q.4; 9 (Appendix 3) Dean/HOD interview schedule Q.6 (Appendix 1) Document review check list Q. 4 (Appendix 5)

The relevant variables gleaned from the DOI and Punctuated Equilibrium Theories informing this study are summarized in table 3. These are revolution periods, deep structure (Punctuated Equilibrium theory), antecedents' variable, awareness-knowledge, relative advantage, complexity, compatibility, observability, trialability (DOI Theory). These theoretical variables are further elaborated in the review of literature chapter (Chapter three of this thesis). The gleaned theoretical variables were used in this study to frame questions in the data collection instruments and as analytical tools in data analysis and presentation and discussion of findings chapters (see Chapter five and six of this thesis).

Table 3: The variables relevant to this study gleaned from the integrated theoretical framework

Specific research questions of the study	Theoretical variables relevant	Theory	Questions addressed in data collection instruments
1. What are the goals of LIS education and training in Zimbabwe? 2. What competencies are encapsulated in LIS curriculum?	Deep structure <ul style="list-style-type: none"> • Core beliefs • Strategy • Organizational strategy • Control system 	Punctuated Equilibrium	Dean/HOD interview schedule Q.3 (Appendix 1) Document review checklist Q. 1; 2; 3; 4 (Appendix 5)
3. What LIS skills are needed by the information industry? 4. What is the extent of information technology integration in the LIS curriculum? 5. What human and	Revolution <ul style="list-style-type: none"> • Internal environmental change • External environmental change 		LIS graduate Questionnaire Q.3; 4 (Appendix 4) LIS Employers interview schedule Q.3; 4 (Appendix 2) Dean/HOD interview schedule Q.5 (Appendix 1) LIS faculty questionnaire Q.3 (Appendix 3) LIS faculty

Specific research questions of the study	Theoretical variables relevant	Theory	Questions addressed in data collection instruments
physical resources are available for delivering LIS curriculum?			Questionnaire Q.4; 9 (Appendix 3) Dean/HOD interview schedule Q.6 (Appendix 1) LIS faculty Questionnaire Q.5; 6; 9 (Appendix 3) Dean/HOD interview schedule Q.6; 7 (Appendix 1)
4. What is the extent of information technology integration in the LIS curriculum?	Antecedents variable Relative advantage complexity Compatibility Observability Trialability	DOI	Dean/HOD Interview schedule Q. 6 (Appendix 1) Document review checklist Q.4 (Appendix 5) LIS faculty Questionnaire Q.4; 9 (Appendix 3)
6. What is the level of awareness by LIS faculty regarding paradigm shift in the information industry?	Awareness-knowledge		LIS faculty Questionnaire Q.1; 2; 9 (Appendix 3)
7. What are the attitudes of LIS academics towards the changes in the information industry?	Antecedents variable Compatibility Observability Trialability		LIS faculty questionnaire Q.1; 2; 7 (Appendix 3)

2.8 Summary

This chapter reviewed the relevant theories applicable to this study namely the DOI and Punctuated Equilibrium Theory. The relevant theoretical constructs gleaned from both the

DOI and the Punctuated Equilibrium Theories were integrated into a single theoretical framework informing this study (see table 3). The gleaned variables were discussed in the context of the research questions and observable trends in practice and literature. The suitability and limitation of both the DOI and the Punctuated Equilibrium Theories to this study were discussed.

CHAPTER THREE

REVIEW OF LITERATURE

3.1 Introduction

The chapter reviews relevant literature on LIS education and training and paradigm shifts in the information industry. The purpose of the chapter is to position the study in the existing body of knowledge, evaluate what has been done on the subject and identify research gaps that provide the rationale for the study. Literature is reviewed based on the eight themes: LIS education and training, goals of LIS education and training, skills needed in the information industry, ICT integration in LIS curricula, resources needed to deliver LIS curricula, awareness of paradigm shifts in the information industry, and attitudes of LIS academics towards changes in the information industry. The themes were derived from the specific questions of the study guided by theoretical variables informing the study. Polit and Beck (2009) and Chigona and Licker (2008) substantiate this approach, emphasizing that theoretical frameworks and research questions provide procedural frameworks essential for organizing research studies systematically. Pedhazur and Schmelkin, (1991) reinforced this further, stating that for a study to be scientifically meaningful, key variables in the study should be guided by the theoretical frameworks underpinning the study. They further stated that theoretical frameworks define the study variables and specify mutual linkages among the variables.

The chapter is structured in four sections. Section 3.2 defines education, training and LIS education and training and discusses how LIS education and training qualifications are articulated and accredited. Section 3.3 reviews literature based on the specific questions of the study and section 3.4 summarizes the chapter.

The purpose of this study was to explore LIS education and training in Zimbabwe and paradigm shift in the information industry. The study sought to address the following research questions:

1. What are the goals of LIS education and training in Zimbabwe?
2. What competencies are encapsulated in LIS curriculum?
3. What LIS skills are needed by the information industry?
4. What is the extent of information technology integration in the LIS curriculum?

5. What human and physical resources are available for delivering LIS curriculum?
6. What is the level of awareness by LIS faculty regarding paradigm shifts in the information industry?
7. What are the attitudes of LIS academics towards the changes in the information industry?

3.2 LIS education and training

The LIS academic discipline can be broadly defined as the theoretical body of knowledge which is taught to students, exchanged amongst educators, studied by researchers, and communicated between professionals in the field (Um and Feather, 2007). The *Oxford Advanced Learner's Dictionary of Current English* (2000) defines education as a process of teaching, training and learning especially in schools or colleges, to improve knowledge and develop skills. Chifwepa (1994:30) maintains that training is the process that results in the acquisition of skills at the level of semi-professionals while education is the process of equipping professionals with the proficiencies integral to the profession, with an emphasis on theory rather than practice. Carnevale, Gainer and Meltzer (1990) state that education and training have often been considered as polar extremes, the former being considered as the mind (abstract) and the latter the mastery (applied), mainly of manual endeavors. However, the use of ICT as an enabler of professional tasks has blurred even further the distinction between education and training (Carnevale, Gainer and Meltzer, 1990 and Elan, 1989). Carnevale, Gainer and Meltzer (1990) argued that worthy educational programmes include both theoretical and practical aspects. They further asserted that education becomes more meaningful when it is contextualized in both theoretical and practical activities. Thus, for any educational programme to be significant, education and training should be an integral component in the curriculum. Raju (2002) observed that LIS curricula encompass both the elements of education and training and it is for this reason that as far as is possible, this study uses the compound education and training. LIS education and training is used in this study instead of “education” “training” because of the overlap of the terms.

Hjorland (2002) describes LIS education as a field which engages in teaching and research about libraries, information and documentation as a domain in its own right. LIS education and training in this thesis is used to refer to educational programmes which engage in teaching and research about libraries, knowledge, information and documentation as an

academic cognitive domain (Hjorland, 2000). LIS is therefore, used in this study as the generic acronym encompassing library and information science; information studies; information services; information management; knowledge management; and librarianship.

3.2.1 Articulation of LIS academic programmes

HEIs have the mandate to articulate professional qualifications (Okello-Obura and Kigongo-Bukenya, 2011). HEIs educational programmes are articulated using five categories: “(1) nature and type of qualifications that programmes offer, (2) duration and credits requirements for the qualifications, (3) academic level of the qualifications, (4) mode of instruction, (5) orientation” (Ocholla and Bothma, 2007:153). Most LIS schools in Africa are located within universities and technical colleges/ technikons commonly known as HEIs (Ocholla and Bothma, 2007; Okello-Obura and Kigongo-Bukenya, 2011; Raju, 2005). Raju (2005) points out that while technikon and university education are both located in HEIs they are regarded as different entities, independent of each other in terms of standardization and accreditation.

Colleges and technikons offer vocational competency based education and are commonly known as Technical Vocational Education and Training (TVET) institutions. TVET programmes offer undergraduate qualifications (Certificates, Diplomas and in some instances Degrees) (Raju, 2005). University programmes are oriented towards general education and offer two levels of qualifications: undergraduate (Certificate, Diplomas and Degrees) and postgraduate (Postgraduate Diplomas, Masters and Doctoral degrees) (Minishi-Majanja and Ocholla, 2004; Okello-Obura and Kigongo-Bukenya, 2011). The orientation and focus of educational programmes have major implications for the depth and coverage of the curricula, duration of study, and mode of study as well as for the power and value of the qualifications conferred in society and industry. The orientation and focus of LIS educational programmes symbolize the fundamental choices LIS education and training systems has made (Gersick, 1991) and also signify what LIS education and training programmes offer the society, industry and the profession they serve (Prigogine and Stengers, 1984).

Over the years, University and TVET LIS educational programmes have been accredited differently through different accreditation bodies, and this has resulted in impermeable boundaries between the two educational sectors (Raju, 2006). The International Federation of Library Associations and Institutions (IFLA) mission to South Africa in 1993 substantiated

this, stating that there was little or no standardization between TVET and university based qualifications in South Africa. This has been an observable trend in most countries around the world (Raju, 2006). However, the South African government made commendable efforts to harmonize its TVET and university sectors through the enactment of the Higher Education Act (Act 101 of 1997). The enactment of the Higher Education Act 101 of 1997 led to the crafting of the education white paper which advocated for major transformations within HEIs in South Africa (Raju, 2006). This resulted in the establishment of the National Qualifications Framework (NQF) which synchronized HE education in South Africa and brought both TVET and university education under common regulatory frameworks and accreditation bodies (Minishi-Majanja, 2004; Raju, 2006; Ocholla and Bothma, 2007). Synchronization of university and TVET educational systems in South Africa facilitated student's mobility between the two sectors (Nassimbeni, Stilwell and Walker, 1993).

3.3.1 Goals of LIS education and training

The researcher failed to retrieve sufficient literature on the goals of LIS education and training, and therefore, the goals of LIS education and training programmes are discussed within the context of HE in general. This suggests a major research gap in literature, which this study intends to contribute to through adding literature on the goals of LIS education and training to scholarly discourse. Literature has shown that the traditional goals of HE are teaching and learning, and research (Heim, 1986; Borko, 1984; and MacGragor, 2011; SARUA, 2010: 2008). The teaching and learning goal is critical for the development of learned and skilled human capital for industry and the professions, while research is vital for the advancement of new knowledge (Colbeck, 2002). Therefore, the goals of teaching and learning and research characterize the deep structure (underlying order) of HEIs as suggested in the Punctuated Equilibrium Theory. It is this deep structure which defines HEIs activity patterns and that maintains their existence and flow of resources from the environment (Tushman and Romanelli, 1985). Teaching, learning and research represent the deep structure of LIS education and training programmes, that is —. a network of fundamental, interdependent "choices," of the basic configuration into which a system's units are organized, and the activities that maintain both this configuration and the system's resource exchange with the environment" (Gersick, 1991:15). —Like a decision tree, the trail of choices [teaching, learning and research] made by a system [LIS education and training] rules many options out, at the same time as it rules mutually contingent options in" (Gersick, 1991:16).

However, there are some concerns from some academics about the relevance and role of teaching and research in HEIs. Barnett (1992) argued that teaching and research are different and incompatible academic activities which should be differentiated in HE. Barnett based his argument on the belief that research interferes with teaching as much as teaching limits the available time for research (Barnett, 1992). In addition, a series of empirical studies conducted to determine if there is a measurable correlation between teaching and research found a very small positive correlation between teaching and research [amounting to 0.6 by Hattie and Marsh (1996) and to 0.12 by Fieldman (1987)]. The studies concluded that teaching and research outputs are autonomous, neither enhancing nor detracting from each other (Hattie and Marsh, 1996 and Fieldman, 1987). However, the studies found that mediating factors such as organizational resources, production processes, faculty capacities and faculty individual characteristics as the major reasons for the negative association of teaching and research (Colbeck, 2002).

Fieldman (1987); Hattie and Marsh (1996); Colbeck (2002) corroborate that faculty research capacity, individual personal traits, academic workloads and institutional orientation influence teaching and learning as well as research outputs in HE. Watson, Motala, and Kotecha (2009); Colbeck (2002) suggest that without the requisite research capacity among faculty, without deep-rooted research culture and ingrained research attributes among faculty, and without manageable workloads, research output is limited and the development of the research skills base is greatly repressed. Colbeck (2002) opines that extroverts (outspoken) are better teachers while introverts (reserved) are likely to be better researchers. However, this assertion is not empirically proven and should be considered with caution (Fieldman, 1987; Hattie and Marsh, 1996).

Wormald (2013) claims that institutional orientations of HEIs determine their research focus, research priority and research output. The Carnegie Foundation for Advancement of Teaching (2010) show that undergraduate-focused HEIs prioritize teaching and learning rather than research, whereas postgraduate-focused institutions prioritize research output rather than teaching and learning. Fieldman (1987) suggests that academic discipline variations also affect the association between teaching and research outputs. This was confirmed by Colbeck (2002), asserting that academic discipline variations influence the null

and negative or positive correlation between teaching and research output in HEIs (Colbeck, 2002).

Colbeck (2002) maintains that the availability of research infrastructure plays a critical role in determining research outputs in HEIs. The European Commission (2014) defines research infrastructures as the facilities, resources and related services used by the research communities to conduct top-level research in their respective fields of specialties. The European Commission (2014) corroborates Colbeck's (2002) claim, declaring that the availability of research infrastructure such as information services (libraries, archives), resources (databases, laboratories, competencies, funding, computing facilities), and services (high capacity/speed communication networks, networks of computing facilities) determine the level of faculty engagement in research activities in HEIs. This view is espoused also by SARUA (2010), asserting that without the basic research infrastructure in place, it is very difficult for HEIs to attract robust research funding and world class researchers (SARUA, 2010).

Fairweather (1996) contends that HEI policies also contribute to the competition between research and teaching. He maintained that institutional policies on rewards and evaluation sometimes are biased towards; research thereby fragmenting research and teaching. Fairweather (1996:10) declared that in most HEIs, faculty, rewards, promotions and tenure are based on research output rather than on the commonality of teaching and research. He further claimed that in most HEIs research outputs attract more incentives than teaching. As a result, HE faculty tend to neglect teaching to attain rewards for research.

Cheng (2001a) observed that HE globally, is in the midst of a major transformation, realigning its educational systems to new means of production, work organizations, socio-economic needs and advanced developments in ICTs. HEIs have assumed new roles commonly referred to as the 'third mission of universities' (Trippel, Sinozic and Smith, 2012; Laredo, 2007). However, Trippel, Sinozic and Smith (2012) declared that while the concept of the third mission of universities might be new in developing countries, it is well established in developed countries. Within the third mission function, universities are called to be leaders in entrepreneurial processes, and knowledge transfer to industry; major actors in regional innovation systems, knowledge generators, and actors in innovation-enhancing interactions; and innovation transfer leaders (Trippel, Sinozic and Smith, 2012:2). Laredo (2007) stated that

the agenda of the third mission of universities is for universities to engage directly with the economy and societal needs.

Drawing from the punctuated equilibrium theory, the adoption of the concept of the third mission of universities suggests internal and external environmental changes. The internal and external changes have pulled the activity patterns and structure of HE out of alignment with its environments, threatening the system's ability to obtain resources and fulfill its obligations to society, industry and professions (Gersick, 1991). Johnson, Scholes and Whittington (2008) reinforce this further, noting that due to the transient nature of change, many organizations have experienced major strategic gaps resulting in environmental misalignment. This misalignment calls for revolutionary transformations as inferred in the Punctuated Equilibrium Theory. The emerging functions of universities suggest revolutionary changes in the underlying order of universities.

3.3.2 Competencies encapsulated in the LIS curriculum

Blooms taxonomy of learners' behaviors has influenced curriculum development for many years and has provided a foundation for competency based instructions for most professions, including LIS (Bloom, 1984). Reitz (2004:164) defines competence as the capabilities expected of a person hired to perform a specific job successfully or upon successful completion of a course of study or training. Competence according to Schroeter (2008:3) is ~~the~~ ongoing ability of an individual to integrate and apply the knowledge, skills, judgment, and personal attributes required to practice safely and ethically in a designated role and setting". Thus, competencies are the observable application of knowledge that results in accomplishment of a specific professional task and the capacity to transfer knowledge and skills to new tasks and situations.

The competencies envisioned for any profession are embedded in the curriculum and the learning objectives of the courses offered (Schroeter, 2008). Learning objectives are described by Simon and Taylor (2009) as clear objectives that describe intended learning outcomes of students after completion of a course. The curriculum objectives therefore, represent the level of competencies that lecturers pursue in the course of instruction (Simon and Taylor, 2009). However, due to innovations in the society and advanced development in

ICT, the competencies encapsulated in LIS curricula are constantly changing as the profession assumes new roles and as new technologies are released in the market (Gerolimos, 2009; Tammaro, 2007).

Coral and Brewerton (1999:114) and Gilton(2012) state that “LIS professionals are assuming teaching and training roles, developing full scale course programmes in Information Literacy Skills (ILS), and working in cohort with academics in curriculum design and resource based education without being formally trained in the requisite pedagogy”. Additionally, LIS professional are publishing, hosting scholarly publications in institutional repositories (Nonthacumjane, 2011 and Harris, 2012). ICT has therefore become an enabler of the LIS professional’s tasks (Broady-Preston, 2009) and has extensively broadened LIS professionals’ tasks, employment landscape and core competencies required (Choi and Rasmusen, 2009, Mathews and Pardue, 2009; Thompson, 2009). LIS professionals have encompassed new roles that transcend professional boundaries and are expected to have transdisciplinary knowledge and competencies (Norry, 2004). LIS professionals are required to have an in-depth understanding of information related law and ethical issues pertaining to Intellectual Property Rights (IPR) such as copyright laws and information access, rights and privacy (Pettigrew, 2013; Gibbs, Steel and Kuiper, 2011). Also, the LIS labour market is demanding generic and transferable skills previously not taught in LIS education and training programmes (Pettigrew, 2013).

These shifts have brought serious concerns about disciplinary core knowledge in LIS curricula (Lewis, 2010). LIS education and training programmes have been compelled to develop and integrate new fields of study in their curricula that aggregate and transcend traditional boundaries (Moran and Marchionini, 2012). The trend signifies an academic discipline in revolutionary transitions as assumed in the Punctuated Equilibrium Theory. Tushman, Newman and Romanelli (1986) further opine, that organizations in transition are highly unstable and if the transition period does not end quickly and a new equilibrium period established, diverse vested interests may pull the organization back towards its established old underlying order and the transition period end fruitlessly. Therefore, if the curriculum reforms in LIS education and training programmes are not effectively managed to achieve deep-rooted changes, the Punctuated Equilibrium Theory predicts that the transformations

might result in minor changes within the old framework (Weick and Quinn, 1999; Gersick, 1991; Tushman and Romanelli, 1985).

3.3.2a Published competency frameworks

The Pacific Policy Research Center (2010) states that new competencies required in contemporary work environments are replacing the basic skills, competencies and knowledge expectations of the past labour market. This has reinforced the need for developing and defining competencies which LIS graduates should be proficient in before entering the profession. Stoffle and Leeder (2005) remarked that producing such documents has proven difficult due to lack of consensus on what constitutes a generic curriculum across the LIS profession. However, this has not hindered professional associations from publishing competency frameworks that define sets of broad core competencies, knowledge base, skills and values to be inculcated in those wishing to join the profession (Ur Rehman, 2012; Sutton, 2011).

Empirical evidence has shown that apart from Northern America, Canada and some parts of Europe, the published competency frameworks are not well-known (Lester and Van Fleet, 2008). Lester and Van Fleet's findings (2008) suggest that a large number of LIS schools were not aware of the published competency frameworks. The study revealed that only a handful of LIS schools reported using the documents for curriculum development or reform. Lester and Van Fleet (2008) recommended that international organizations such as the International Federation of Library Associations and Institutions (IFLA) need to market their competency framework globally to support their use.

The International Federation of Library Associations and Institutions; the Chartered Institute of Library and Information Professionals (CILIP); American Library Association (ALA); European Curriculum Reflections of LIS Education (EUCLID); Special Libraries Association (SLA); and Association of South Eastern Research Libraries (ASERL) have all published competency framework documents outlining professional and technical knowledge as well as proficiencies and skills those wishing to enter the profession should acquire (Borko, 1984; Weech and Tammara, 2009; Rehman, 2012). However, the IFLA Section on Education and Training notes that the competency frameworks are only standards which should be used as guidelines or benchmarks (IFLA Education and Training Section, 2012). IFLA Education and

Training Section (2012) further states that these frameworks are neither prescriptive nor specific as they are general and are subject to interpretation in areas of emphasis and often subject to the knowledge and expertise of the curriculum designers.

The IFLA competency framework is used for transparency, equivalency and recognition of qualifications (Weech and Tammaro, 2009:1) and at times it is used as a benchmark for curriculum design and reform. Tammaro (2012) states that the goals of the IFLA set of competencies are to support internationalization and quality assurance in LIS education. The IFLA competency framework focuses on two major activities: the harmonisation of LIS curricula and the provision of standardized procedures for equivalency of qualifications (Tammaro, 2012).

The IFLA competency framework is founded on ten ‘core’ elements organized in three groups, relating to conceptual knowledge, professional and technological capabilities and technical competencies. These were founded upon the prevalent model of information science and follow the information cycle (selection/creation of resources; organization, indexing, storage; dissemination and use) (IFLA Education and Training Section (2012). IFLA ten core elements are illustrated in figure 1:

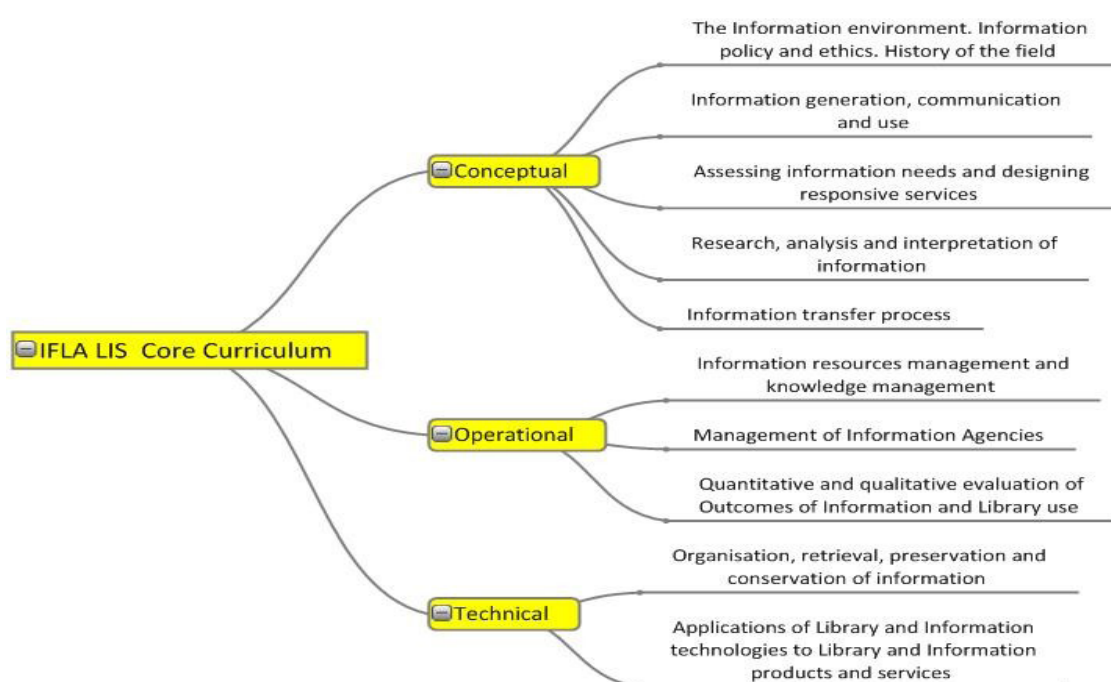


Figure 1: IFLA core elements (Adapted from IFLA, Section Education and Training, 2012:2).

In addition to the ten 'core' elements illustrated above, IFLA encompasses three other aspects deemed integral to LIS education and training. These include practicum, transferable skills, and continuing education (IFLA Education and Training Section, 2012). IFLA Education and Training Section (2012) stresses that internship should be an integral part of LIS curriculum. It further affirms that if practicum is incorporated in LIS curriculum, it provides LIS graduates with an opportunity to appreciate the interplay between professional theories and their application in professional practice (IFLA Education and Training Section, 2012).

IFLA competency framework regards transferable generic skill as an important component of the LIS curriculum (IFLA Education and Training Section, 2012). The published competency framework emphasized that graduates be equipped with analytical and problem-solving skills transferable to the working environment (IFLA Education and Training Section, 2012). It also recommended LIS programmes to provide continuing education in order to enable practicing LIS professionals to update their competencies regularly (IFLA Education and Training Section, 2012). In addition, IFLA published competency framework accentuate that workshops, a chartership scheme, short courses and advisory professional programmes to be developed and offered in partnership with other agencies for the benefit of practitioners (IFLA Education and Training, Section 2012).

Similarly, ALA revised and adopted its competency framework in 2009 (American Library Association, 2009). The competency framework "defines the basic qualifications for all persons graduating from an ALA-accredited master's programme in library and information science" (American Library Association, 2009:1). The ALA competency framework addresses the statements of knowledge and competencies developed by relevant specialized professional organizations in the country (American Library Association, 2009). The ALA competency framework enumerates its core as:

- –Foundations of the Profession;
- Information Resources;
- Organization of Recorded Knowledge and Information;
- Technological Knowledge and Skills;
- Reference and User Services;
- Research;

- Continuing Education and Lifelong Learning; and
- Administration and Management” (American Library Association, 2009:1).

These are further divided into detailed knowledge units which define the specific components of the broad categories enumerated above. Like IFLA, ALA competency framework also emphasizes continuing education and lifelong learning.

In 2012 CILIP published its Professional Knowledge and Skills Base (PKSB) which outlines the areas of professional and technical expertise as well as the generic skills and capabilities that are required across the Library, information and knowledge profession. The PKSB schema is shown in figure 2.



Figure 2 CILIP professional knowledge and skills base (Adapted from CILIP, PKSB, 2012).

The PKSB is portrayed by concentric cycles, each representing different professional aspects which are valued as important by the CILIP professional body (CILIP, PKSB, 2012). At the core of the PKSB schema lie ethics and values. CILIP suggests that ethics and values underpin the work of the practitioners in the sector, and therefore are essential in the profession. The second wheel of the schema comprises professional expertise and generic skills, and it is important to note that generic skills are regarded as equally important as professional expertise in the CILIP PKSB. The third wheel consist of broad competencies which are significant to the profession, such as IT and communication, collection management and development, records management and archiving, information governance and compliance, research skills, knowledge and information management, organization of knowledge and information, leadership and advocacy, strategy planning and management, as well as customer focus, service design and marketing (CILIP, PKSB, 2012). The last two wheels of the schema put into context the competencies outlined in the CILIP PKSB.

IFLA, ALA and CILIP published frameworks signify that the core competencies of the LIS profession have broadened. Therefore, it has become difficult to determine what constitute core competencies in LIS (Steig, 1992). Robbins (1990:40) asserts that core competencies of the LIS profession “...differ in their manifestation from one educational programme to the next”. Numerous studies have been done in LIS schools in different parts of the world and they have failed to agree on what constitute core competencies in the field (Grotzinger, 1986). This problem has been exacerbated further by the growing dependency on ICT in the LIS profession and the transitory nature of the current information environment (Steig, 1992). Kajberg and Lorrington (2005:236) reiterate that the “issue of competency frameworks must be construed with great care as some of the themes considered as topics in some statements are viewed as generic skills in other statements”.

A number of empirical studies, Beheshti (1999); McKinney (2006); Markey (2004); Tam, Harvey, Mills, 2007), have been conducted to determine what constitute core competencies in LIS curricula, and the studies have failed to agree on what constitute core competencies in LIS within a region, state and even among LIS education and training programmes in a country. However, the competencies suggested as core in the findings of these studies often

fall within the categories of the competencies outlined in IFLA, ALA and CILIP published competency frameworks (Lester and Van Fleet, 2008).

Beheshti (1999) surveyed the course content of ALA-accredited LIS education programmes and found that the competencies encapsulated in the curricula were technology management, organization of information, research, searching and database development, media, rare materials reference sources, children's literature and services, professional issues, database development and information retrieval. McKinney (2006) also found that LIS education programmes were not complying with ALA published frameworks and were selectively integrating components of the ALA competency framework as part of their core curriculum. McKinney (2006) found that some of the components of the published competency framework, although listed as core, are relegated as electives in LIS education and training programmes in America. McKinney (2006) study listed knowledge organization, professional ethics, knowledge dissemination, technological knowledge, as well as research and management as core competencies in the surveyed LIS schools.

While Markey (2004), in a survey of course descriptions of 54 ALA-accredited LIS programmes, found that the core courses of the 54 schools surveyed consist of five courses: organization, reference, foundations, management and research or ICT. This prompted Markey (2004) and McKinney (2006) to conclude that not all competencies listed in the ALA competency framework are regarded as core requirements in ALA-accredited LIS schools. They further noted that most of the themes listed as core in the ALA published framework are taught as electives. This suggests that LIS graduates in ALA-accredited programmes are graduating without the competencies considered integral in the ALA published competency framework (Tam, Harvey, Mills, 2007). The studies cited the need for standardization of LIS core curriculum in ALA-accredited LIS schools (Markey, 2004; McKinney, 2006; Tam, Harvey, Mills, 2007).

Hallam, Partridge and McAllister (2004) observed that skills in social informatics, knowledge management, information management, information economics, information resources development, IT applications, information systems, networking, Internet, artificial

intelligence, digital libraries, Web 2.0, virtual library, management of information organizations, human resource development, information organization, information retrieval, collection and access management, professional ethics, marketing, research and generic and transferable skills are being required in the contemporary LIS work environments.

In Asia, Tam, Harvey and Mills (2007) conducted a Delphi study in Hong Kong and China analyzing the core competencies and generic personal qualities of LIS curricula in the region. The study found that curriculum content of LIS programmes in Hong Kong and China is focused in the following areas: ~~Information~~ information service skills, research and analytical skills, communication skills, collection development skills, management skills, subject knowledge and information services organization skills as well as generic personal qualities. Generic personal attributes were listed as willingness to learn and continue to learn, flexibility, creativity, innovative, change, awareness of wider professional issues, ability to conceptualize, people oriented, collaborative partnership, ability to learn from others and teamwork” (Tam and Mills, 2006:184-185). Tam and Mills (2006:185) concluded that LIS curricula in Asia would best be organized broadly into three areas: ~~information~~ information services skills together with research and analytical skills; communication and management skills; and collection development skills and subject knowledge”.

In Africa, a study by Shiholo (1999) revealed a high rating for competency in information technology and management. The study found that LIS programmes focus on knowledge of automation activities, networking, databases, online searching, systems development, and computer technology, management of information and knowledge management. Shiholo (1999) concluded that in the emerging networked environment, LIS graduates should therefore have a proper foundation in information technologies, communication theories, financial skills, information systems/management, quantitative skills, environmental skills, environmental knowledge, information seeking and user interfaces. In Nigeria, Kamba (2011) surveyed LIS curricula and found that LIS education and training curricula are focused on traditional subjects of library science and need to include contemporary themes. However, the study identified that the curriculum included new themes such as indigenous knowledge systems and introductory courses in ICT.

The studies reviewed above show that the competencies encapsulated in LIS curricula globally are continuously increasing, and Stoker (2000) warns of the dangers of an ever enlarging core. He concluded that an enlarged intellectual body of knowledge ultimately results in the marginalization of important core courses, such as cataloguing and classification, a view espoused also by Ocholla (2001); Cronin (1985); Gorman (2004); Shiholo and Ocholla (2003). Shiholo and Ocholla (2003) noted that the need for traditional subjects such as cataloguing, classification, reference sources, collection development, information services and preservation have declined over the years. Similarly, Ocholla (2001) observed that courses in cataloguing and classification formerly regarded as integral in the LIS profession are being slowly phased out in the LIS curriculum.

Cronin (1985:13) questioned “whether it will continue to be practical or desirable for a single institution to provide education and training for all types of work or whether the increasing specialization of the job market will make more a specialized forms of education and training necessary?” In addition Raju (2005:70-71) further queried “whether it is practicable for LIS departments to teach all that has to be taught, especially in an increasingly diverse information environment where new skills are required as new technologies are released”. Stilwell (2004:22) argued that “no single department is likely to have the capacity to span the full spectrum of programmes required”. She suggested that priorities need to be made in LIS education and training programmes to balance the curriculum content, time and available resources.

Cronin suggested two probable options for LIS departments: “to retain their hold on the ‘information whole’ and provide foundation courses to cover the fundamentals of information work including specialization tracks or concentrate on a limited number of career tracks and offer tailor made courses for a particular operational environment” (Cronin, 1985:14). While Stoffle and Leeder (2005) argued that LIS education and training programmes should offer specialized training or expand the programmes in terms of content and credit hours, they concluded that in the absence of this, LIS programmes need to remain generalized and take into account the wide-ranging demands of the profession in order to best serve their students.

Boll (1972) developed the following five theories which he used to explain the significance of an enlarged core for LIS curricula:

- One Profession in One Year Theory
- Maximum Flexibility in One Year Theory
- Changed Emphasis Theory
- Growing Single Profession Theory
- Structured, or Several Sub-Professions Theory.

Boll (1972) also explained that when the core knowledge of a discipline is continuously enlarged, there is need to increase the years or number of hours which graduates should spend studying. He further claimed that when the years are not extended, the core knowledge is either cut drastically or eliminated in favor of increased specialization. This situation which has been observed in LIS education and training in Europe where the core or required modules in CILIP-accredited programmes range from two to nine modules and vary in content (Goblaskas, 2012).

In the One Profession in One Year Theory, Boll posits that entry to the LIS profession demands that graduates acquire substantial core knowledge of the profession, as well as specialized professional aspects to allow for occupational flexibility. The entry qualifications to professional work in LIS vary: for example in South Africa and Australia, the requirement is an Honours Diploma while in the United States of America and Canada is a Masters Degree. In most cases, the duration of the Honours Diploma or Masters Degree is one year. Boll (1972) argued that within a one year period, the study of the core competencies can only be achieved at the expense of exposure to specialized aspects (Boll, 1972).

The Maximum Flexibility in One Year Theory suggests that the LIS field is expanding (Boll, 1972). There are diverse professional core competencies and skills which those wishing to join the profession should master and the diverse core competencies cannot be addressed in one year of study (Boll, 1972). The Maximum Flexibility in One Year Theory posits that the core competencies should either be reduced or eliminated (Boll, 1972). The theory further speculates that each student should be allowed to select courses of interest to develop his/her envisioned career path (Boll, 1972). The theory further conceives that if core competencies

are needed at all, they should be for general awareness of the aspects in which the student does not wish to specialize (Boll, 1972).

The Changed Emphasis Theory advocates that LIS is still one profession, but its very nature has changed radically in recent years due to innovations (Boll, 1972). As a result some components of its traditional core including cataloguing, classification, reference services, and administration can be eliminated in favor of increased specialization.

The Growing Single Profession Theory hypothesizes that since the LIS field is expanding, the profession needs to consider decreasing or increasing the core competencies in the LIS curriculum as well as the duration of study for LIS qualifications (Boll, 1972).

The Structured or Several Sub-Professions Theory postulates that LIS contains more specialization than the profession generally admits (Boll, 1972). As a result, the requirements of LIS programmes, instruction, and employment practices must be structured so as to reflect specializations. The Structured or Several Sub-Professions Theory envisages that LIS education and training programmes should be structured along specialized tracks (sub-professions) with minor common core competencies integrated in the sub-profession core competencies (Boll, 1972:195-197). This view is also advocated by Cronin (1985).

It is evident that there are conflicting views on the issues of core competencies in LIS as discussed by Boll's theories. These conflicting views have made it a challenge for any professional association or individuals' to devise a comprehensive generic competency framework for LIS education and training. Each LIS programme designs and revises the curriculum according to the requirements and resources of that country, rather than as part of a general trend or global pattern (Boll, 1972). Lester (2013) argues that competencies and skills required of any professions cannot be defined in a competency framework no matter how inclusive it might be. However, Lester and Van Fleet (2008) state that the competency frameworks are important in designing and reviewing LIS curricula and can be a source of useful information to employers when crafting job descriptions and recruiting.

Additionally, the published competency frameworks suggest a trend towards internationalization of LIS education and training curricula (Abdullahi and Kajberg, 2004).

Proponents of internationalization argue that internationalizing LIS curricula helps to provide consistency and standardization (Abdullahi and Kajberg, 2004). Cyriaano and Osman (2011) question where the generic curriculum will originate from. They further argue that curriculum designed in developed countries is formulated based on experiences, methods, needs and resources and ICT infrastructure prevalent in the developed world. Cyriaano and Osman (2011) caution that curriculum developed in developed countries is not always applicable in developing countries where the socio-economic, cultural and technological development is different. They claim that adoption and implementation of such curricula in developing countries renders student learning experiences incomplete and learners will be ill-equipped for the needs of their respective environments. This view is shared by Johnson (2007:66) who observed that “without adapting the theory and practice of LIS to local conditions LIS education and training programmes in Africa risk becoming pale reflections of their Western models”. Therefore, what is required is a core curriculum suitable to the conditions and level of development of the countries where they will be used. The realities of the individual states (e-readiness, infrastructure development, capacity, funding and needs) must be taken into consideration (Johnson, 2007).

3.3.3 Skills needed in the information industry

The emerging information/knowledge economy is demanding graduates with a profile of knowledge, skills and attitudes that include, but go beyond, the disciplinary expertise or technical knowledge that traditionally formed the core of most LIS university courses (Barber, Donnelly and Rizvi, 2013: 12; Pettigrew and Durrance, 2001). Dinov (2008) observed that workplace practices have significantly altered in the last few decades. The contemporary LIS employment landscape seeks individuals with transdisciplinary competencies, capabilities, training and varying interests (Dinov, 2008; Pettigrew and Durrance, 2001). LIS professionals need to be able to reason, integrate knowledge and make critical decisions where no single disciplinary knowledge is likely to solve a problem (Dinov, 2008).

Rifkin (1995:25) states that “no longer is the accumulation of skills and knowledge a primary prerequisite for employment. Instead it is necessary to be able to adapt to new situations, continuously learn and work cooperatively”. In addition he highlights that creativity is replacing professional knowledge base, whilst ability to work in a team environment is

becoming a prerequisite for many employment opportunities. Bainbridge (2013) further reiterates this, stating that creativity has replaced evaluation at the top of Bloom's taxonomy of learning objectives. This characterizes revolutionary changes in the objectives of learning as inferred in the Punctuated Equilibrium Theory by Tushman and Romanelli (1985). The ascendancy of creativity at the top of Bloom's taxonomy of learning objectives signifies the new choices around which a new underlying order is being crystallized in education (Gersick, 1991).

Jackson (2013) and International Association of Universities (2010) have conducted studies to determine the employability skill sets required in the labour market. Jackson (2013) found that despite attempts made by LIS education and training programmes to produce graduates with the requisite skills, employers still regard LIS graduates as inadequately prepared. ESECT and HE (2004:8) defined employability skills as ~~a~~ set of achievements – skills, understandings and personal attributes – that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy". Pool and Sewell (2007) point out that the term employability encompasses a combination of basic academic skills, higher-order thinking skills, personal qualities, transferable generic skills and work experience. This prompted Kennan, Cole, Willard and Wilson (2006) to declare that the LIS employment landscape has become highly variable and heterogeneous, resulting in a vague set of skills which employers seem to value. Bronstein (2007) asserts that LIS employers are more concerned with soft skills, analytical abilities and communication skills, customer service skills, business and marketing skills, and flexibility than with the traditional technical skills that define the profession.

Buchem and Hamelmann (2011:5) observed that employers are valuing generic and transferable skills which include a combination of ~~pr~~problem solving skills, collaboration, communication, global awareness, information literacy, user oriented skills, technical skills, a commitment to lifelong learning and the ability to work in teams. Khoo, Majid and Lin (2009:6) concluded that information professionals have to be user-oriented, service-oriented, adaptable and flexible, quick to pick up new skills, and should also have an entrepreneurial or enterprising spirit. Goulding, Bromham, Hannabuss and Cramer (1999) claimed that library and information employers are valuing personal skills and traits such as enthusiasm, initiative, interpersonal skills, commercial awareness, extroverted personality, independence,

entrepreneurial flair, and teamwork, ability to work under pressure, service orientation and flexibility rather than technical skills.

The study by Chow, Shaw, Gwynn, Martensen and Howard (2011) suggested that librarians come into contact with many diverse people and as a result they need competencies in communication, publicity, liason, advocacy, customer care, marketing, team work and leadership. Cronin, Stiffler and Day (1993) also found that subject expertise and entrepreneurship skills have become vital in LIS work environments. Mathews and Pardue (2009) found that ICT-related skills were in high demand in the LIS labour market. Feng (n.d) findings revealed that LIS work environments require individuals with knowledge of ICT applications. Stephens and Hamblin (2006) study found that LIS employers seek to recruit LIS professionals with computer skills, in-depth knowledge of technology, proficiency in library automation, expertise in online database searching, knowledge of online cataloguing and metadata management, skills in information retrieval, word processing, desk top publishing, web page design and maintenance. Another study conducted by Chain-Navarro, Canavate and Martinez (2008) revealed that LIS employers were valuing knowledge of resource management, web systems design, maintenance and updating. The study concluded that the profiles of competencies required in the Spanish LIS job market offer a better fit for computer science graduates. This implies that the traditional labour market demands graduates highly knowledgeable in ICTs.

Myburgh (2000:2003:221) undertook a five year longitudinal study in Australia, based on job advertisements that appeared in the Australian newspapers and websites. The study found that employers in Australia were valuing knowledge, competencies and skills in:

- –social impact of information;
- communication technologies;
- research;
- records management;
- entrepreneurship;
- evaluation and selection of ICT applications and hardware;
- information systems design and management
- knowledge of software and relational databases;

- ability to create data structures;
- interpret and apply legislation and regulation;
- understand and implement classification and functionality systems; and
- indexing and thesaurus development”.

The study revealed that traditional technical competencies such as cataloguing, classification and reference services were no longer regarded as important by LIS employers in Australia.

Another study by Halder (2009) found that LIS employers require LIS professionals with proficiencies in group presentation, writing and the ability to solicit grants. Alison (2014) declares that LIS employers cherish creativity, leadership, administrative, interpersonal and technological competencies. Halder (2009) further maintains that skills in planning, designing, developing, implementing and managing have become integral to efficient work flows and the provision of information services.

In Botswana, the findings of a study by Aina (1993) reported that many LIS employers require LIS professionals with transdisciplinary knowledge. LIS employers in Botswana prefer hiring individuals with combined proficiencies in LIS, ICT and transferable generic skills (Aina, 1993). Aina and Moahi (1999) findings revealed that marketing and public relations competencies are considered as essential in LIS employment landscape. Another study by Shongwe and Ocholla (2011) found that applicants for LIS positions are required to possess in-depth ICT expertise encompassing knowledge of ICT infrastructure, software, implementation, ICT policies, electronic records management systems, and management information systems. The study further revealed that communication skills (written and verbal), people management skills, leadership skills, interpersonal skills, problem solving and analytical skills, financial management skills, project management skills, change management skills, time management skills, and administrative skills were also highly regarded in LIS work environments in South Africa (Shongwe and Ocholla, 2011). The study further noted that transferable and generic capabilities such as being a team player, credibility, confidence, diplomacy, honesty, and integrity were also sought after by LIS employers (Shongwe and Ocholla, 2011).

A study by Corral (2010) revealed that LIS professionals are called to teach without the requisite proficiency in pedagogy and many acquire these skills on the job. Feng (n.d:2) outlined “communication, teaching (conventional teaching) and eLearning (digital scholarship) and presentation” as vital competencies which LIS professionals should have. Feng concluded that competencies in eLearning, Web languages as well as a working knowledge of digital scholarship are essential and should be integrated in the LIS education and training curriculum (Feng, n.d). Kinkus (2007) also observed that academic library work has become more project-based, and as a result there is need to equip LIS graduates with project management skills. Similarly, LIS work environments require professionals capable of research and publishing (Marinko, 1999), a view acknowledged also by the University of Missouri, School of Information Science and Learning Technologies (2012) and University of Kentucky, School of Library and Information Science (2012). Childers (1984) affirmed that production of professional theoretical knowledge is commonly deemed a requirement of a true profession, and advancement of that knowledge is deemed a requirement of the academic units that serve that profession.

Findings from Lutwama and Kigongo-Bukenya (2004) and Aina and Moahi (1999) in studies assessing the perception of employers on LIS education and training curriculum, found that LIS employers were dissatisfied with the lack of practical skills among graduates. Stoffle and Leeder (2005) argued that the criticism leveled against LIS education is nothing new but as old as the profession itself. A study by Stoffle and Leeder (2005) observed that many of the critics of LIS educational programmes do not understand the goals of LIS education and the demands under which these programmes operate, or the standards to which they should conform. The findings further revealed that practitioners are not aware of the standards and regulatory frameworks surrounding LIS education and training. As a result, they prematurely criticize LIS education and training programmes and want to dictate a curriculum based on the interests or needs of their particular libraries (Stoffle and Leeder, 2005). They further assert that this is done without acknowledging the wide-ranging subject’s matter that LIS schools must address in a specified time frame, limited resources and capacity. Stoffle and Leeder (2005) concluded that while it is important for practicing LIS professionals to

contribute to curriculum development, it is not admissible to permit disgruntled practitioners to dictate what should be included in the LIS curriculum.

Hallam and Calvert (2009) suggested that some of the competencies required in LIS work environments were not part of LIS education and training curricula components. This suggests a major disjuncture between supply and demand of LIS competencies and skills. The findings of the Canadian Library Human Resource Study (2005) found that many entrants into the LIS profession do not believe there is a good match between the course content of their LIS education and training programmes and the demands of the work environments. Two-thirds (63%) of the study respondents felt that LIS education and training programmes provided them with foundational professional background for practice, but they have skill gaps in generic and transferable skills vital in LIS work environments. This might be attributed to the criticism that LIS education and training products were inadequately prepared and thus not work ready. However, a closer scrutiny of literature revealed that the question why LIS graduates were criticized for not being industry ready is an under-researched topic. This suggests a research gap in literature which needs further research.

The diverse competences required of LIS professionals in the labor environment suggest unprecedented transformations in LIS work environments typified in the Punctuated Equilibrium Theory. Weick and Quinn (1999:372) declare that organizations “continuously change by means of repeated acts of improvisation involving simultaneous composition and execution, repeated acts of translation that convert ideas into useful artifacts that fit purposes at hand, or repeated acts of learning that enlarge, strengthen, or shrink the repertoire of responses”. The diverse array of competencies required in LIS labour environments signifies a profession in the midst of revolutionary periods as presumed in the Punctuated Equilibrium Theory.

3.3.4 ICT integration in LIS curricula

Ely (1999) and Rogers (1995) assert that for any innovation to be successfully implemented there is need for facilitative conditions to be in place. Rogers (1995) in the DOI Theory presumed the facilitative conditions as antecedents of innovations. The antecedents of

innovations as speculated in the DOI Theory by Rogers include: the availability of the innovation, knowledge of the innovation, potential adopters and the socio-organizational context of their social system (Rogers, 1995). Ely (1990a: 1999) identified eight factors necessary for the successful implementation and adoption of an innovation within a social system. These include:

1. Dissatisfaction with the status quo: for an innovation to be successfully adopted within a social system, potential adopters should be dissatisfied with their status quo (Ely, 1993). In addition, the potential innovation should be compatible with the perceived needs, practices, culture, values and previous experiences of the social system (MacCallum, 2009; Rogers, 1995). Therefore, if there is a perceived need to change within a social system and the innovation being introduced is compatible with the needs, practices, values, culture, and previous experiences, it is more likely to be adopted (Ely, 1993; Rogers, 1995).
2. Existence of knowledge and skills: The implementation of a successful innovation needs people with the requisite proficiencies. Lack of know-how about the innovation result in lack of adoption (Rogers, 1995; Surry and Ely, 2002), a view that is also espoused, by Hall and Khan (2003) who claimed that the availability of corresponding expertise about the innovation is crucial for the successful adoption of an innovation within a social system. If a new innovation requires complex skills, which is time consuming or costly to acquire, the adoption rate of the innovation might be delayed. Training therefore influences the rate of adoption of an innovation (Surry and Ely, 2002; Ely, 1999).
3. Resource availability: Ely (1993) points out that the availability of resources is critical for the successful implementation of an innovation. He asserted that “an innovation that is not supported by resources such as hardware, software, money and personnel capacity cannot take off let alone be successful” (Ely, 1993:56). Rosenberg (2000) highlighted that infrastructure and capacity available to support the innovation is a vital antecedent of the diffusion of innovation in a social system. The state and level of a country’s technological development is a key determinant of the rate of adoption of an innovation (Rosenberg, 2000). He further argues that the launch of a new innovation should be supported with the requisite infrastructure, technical capabilities and skills to make it viable. However, if the innovation is more advanced for the available infrastructure and engineering capacity for the industry, the adoption rate is limited (Hall and Khan, 2003).

4. Availability of time: Potential adopters need time to learn and experiment, adapt, integrate and reflect on the innovation before the innovation can be fully adopted within a social system (Ely, 1993).
5. Rewards or incentives: Innovation adopters need to be motivated to adopt an innovation and this might be in the form of rewards or incentives (Ely, 1993). This was confirmed by Dick and Carey (1990), who claim that any successful innovation transfer should be supported by motivational rewards and incentives meant to motivate and encourage adoption.
6. Participation: Ely (1993) notes that all stakeholders within a social system should be active participants in the diffusion of innovation process. He further declared that all stakeholders in the diffusion process should be actively involved in decision making, planning and designing of the innovation from the onset. This serves to inculcate a sense of ownership in all concerned parties (Ely, 1993).
7. Commitment: All those involved in the implementation of the innovation should be committed and they should provide unwavering support for the innovation (Ely, 1993).
8. Leadership is evident: Apparent leadership participation in the diffusion of innovation process is integral for the successful adoption and implementation of the innovation (Ely, 1993)

Nawawi, Ayub, Ali, Yunus, and Tarmiz (2005) claimed that Ely's (1990b) conditions of change discussed above are interrelated. Ely's eight conditions of change should be present for an innovation to be successfully adopted. However, if only a few of these conditions are present, there would be low probability of sustained adoption and implementation of the innovation (Ely, 1990b).

A series of empirical studies have been conducted to determine the correlation between adoption of innovation and availability of resources: Mortezaie and Naghshineh (2002); UNESCO (2009); Singh and Wijetunge (2006). Mortezaie and Naghshineh (2002) in a comparative study of graduates of LIS courses in the UK, USA, India and Iran found a correlation between the efficiency of the courses offered and available resources. The study found differences in LIS education and training programmes in developed and developing countries. UNESCO (2009) claimed that levels of ICT integration in the curriculum is influenced largely by the technological development of the state or region in terms of

available bandwidth, ICT infrastructure, ICT policies, and internet connectivity, human, technological and financial resources. Singh and Wijetunge (2006) in their study observed that developing countries often lack adequate ICT resources to successfully integrate ICT in teaching and learning. This suggests that inadequacies in terms of ICT infrastructure, capacity, resources and access are a major impediment to adoption and use of innovations in developing countries. According to DOI inferences, this suggests that adequate facilitative conditions of innovation are not in place (Rogers, 1995)

In many professions including the LIS profession, computer competencies have become essential qualifications for academic and professional success (Piotrowski, 1992). He further points out that gaps in computer competencies and skills disadvantage students' academic and future professional success. Tinio (2003) claims that HE educational programmes, including LIS education and training, are integrating ICT competencies in their curriculum to inculcate LIS graduates with the required competencies and prepare them for the networked information environment in which they will be employed. Students and teachers who are literate in technological skills have advantages in the increasingly globalized and networked information environment (Tinio, 2003). The DOI Theory suggests that if an innovation has relative advantage its rate of adoption is increased (Rogers, 1995).

A study conducted by Goehlert and Snowdon (1980) in the United States of America (USA) reported that 50% of all students graduating from library education and training programmes have computer competencies, while a survey by Liu (2004) which analyzed course syllabi in North America, Europe and Asia found that ICT courses in LIS education and training curricula have drastically increased. King, McMenemy and Poulter (2006) claimed that LIS education and training programmes in the USA have integrated ICT courses in management of ICT, Web 2.0, library automation, social networking and file sharing tools in the curricula. In addition Buarki, Hepworth and Murray (2011) found that LIS schools in the USA have incorporated ICT courses in Web designing, information systems design and use, artificial intelligence, digital libraries, and library 3.0. The study further revealed that minor and major degrees in ICT have gained impetus in LIS education and training.

Another study by Hanson-Baldauf and Hassell (2009) found that LIS graduates in the USA have in-depth knowledge of communication and collaborative technologies; file sharing; networking technologies; instant communication tools; presentation tools; threaded

discussion forums and digital cameras. The study also found that although technologies such as wikis, blogs, and podcasts were important components in the curriculum, LIS graduates reported that the courses lacked hands-on practice. The study revealed that LIS graduates were inadequately prepared to use wikis, blogs, and podcasts in work environments. The respondents suggested that the courses should be practically oriented. This suggests that “the degree to which an innovation may be experimented with on a limited basis” influences its rate of adoption (Roger, 2003:16).

Miwa (2006) studied trends and issues in LIS education and training in Asia, focusing on selected countries such as Thailand, Korea, Taiwan, China and Singapore. The study found that LIS curricula in these countries emphasized traditional library and information science competencies. The study revealed that ICT courses such as information systems, information communication technology, digital libraries, information policy, web design, digital archiving, electronic publishing, and information security have been integrated in the LIS curricula.

In Kuwait, a study by Buarki, Hepworth and Murray (2011) revealed that LIS education and training curricula have integrated ICT courses such as social aspects of information systems, information retrieval and analysis, tools for information literacy, information systems, introduction to database concepts and applications, introduction to computers, networking, artificial intelligence and management of information systems. In another study Buarki, Hepworth, Murray and McKnight (2009:2) argued that the minimum ICT skills that LIS students need include: “using office applications; using and managing library automated systems; maintaining in-house databases; designing and constructing web pages and databases as well as online and internet searching”. Buarki, Hepworth and Murray (2009) found the teaching methods used in LIS education and training in Kuwait to be outdated. While, Marouf and Ur Rehaman (2007) study concluded that LIS curricula in Kuwait emphasize ICT competencies and skills in database management, systems architecture, and intranet design and management, speaking the language of ICT professionals, web design, web application, and development of electronic resources.

Minishi-Majanja (2007) in her observation of Sub-Saharan Africa, found that LIS education and training programmes have infused ICT competencies in the curricula. A number of LIS schools have developed and integrated relevant ICT modules and or merged ICT components

in traditional modules (Minishi-Majanja, 2007) such as cataloguing and classification, collection development, reference services and management. Ocholla (2000) reported inconsistencies in ICT modules offered in LIS curricula. Ocholla attributed the discrepancies to available ICT resources, infrastructure, and faculty capacity and attitudes (Ocholla, 2000). This suggests that ICT integration in LIS curricula is influenced by the availability of ICT resources and infrastructure. This was also observed by Manda (2006) in Tanzania. A study by Manda (2006) revealed that the BA-LIS programme at Tumaini University in Tanzania offers more ICT modules and content than the University of Dar-es-Salaam's MA programme: the study found availability of ICT resources and faculty capacity as deciding factors.

Edegbo (2011) analyzed undergraduate and master's level LIS courses offered in different universities in Nigeria and found that ICT modules were concentrated at the undergraduate qualifications rather than at postgraduate level. Edegbo (2011) suggests that the designers of the master's programmes in Nigeria seem to have forgotten that some of the entrants to the masters programme are not graduates from LIS undergraduate programmes and may not have acquired ICT skills in their undergraduate studies. Such students may graduate without attaining the requisite ICT knowledge and skill for their job performance (Edegbo, 2011). Edegbo claims that this has been an observable trend in LIS education and training in Africa.

Minishi-Majanja (2004); Fourie and Bothma (2006) in separate studies found that a wide variety of ICT modules have been incorporated in LIS curricula in Southern Africa and specifically in South Africa. Minishi-Majanja (2004) in her study noted that LIS programmes are offering ICT modules covering general ICT knowledge, information storage and retrieval, network technologies, communication technologies and library management technologies. Fourie and Bothma (2006) as well as Minishi-Majanja (2004) concur that 90% of LIS schools in South Africa were offering competencies in hardware and software selection, operating systems, general applications software, local area networks and intranets. The studies found that ICT courses in software engineering, distributed systems and broadcasting technologies were rare in LIS education and training curricula in South Africa. In another study Kloppers (1996) found that LIS education and training programmes were offering ICT modules in electronic publishing, intelligent gateways, natural language processing, hypertext, electronic document delivery, on-line database searching, automatic indexing, text digitization and multimedia technologies, keyboard skills and word processing, library automation, database

construction and management, information systems design and analysis, multimedia information sources, telecommunications, and intelligent systems as core or elective modules.

Oparah (2006) observed that not all course contents of traditional subjects such as cataloguing, classification and collection development have been infused with ICT concepts. Zakari (2000) opined that it will be a positive development if all courses and subjects in the LIS curriculum are suffused with ICT concepts and applications. The study suggests that where traditional subjects have been blended with ICT concepts how they are taught and assessed is left to the discretion of individual LIS faculty. This suggests that ICT integration in LIS curricula is being undermined by lack of faculty ICT competencies and lack of clear cut ICT learning and assessment procedures, policy and regulatory frameworks.

Additionally, Mammo (2011) revealed that the focus in some LIS programmes taught in parts of Africa is on library automation, archives and information centers, digitization, database concepts and design, website development and management. The study suggested that the modules are often taught theoretically (Mammo, 2011). Minishi-Majanja (2004); Edegbo (2011) elaborated that most LIS schools fail to achieve a balance of theory and practical teaching of the ICT modules. The studies concluded that ICT modules should allow for theoretical and practical emphasis that is adequate for effective professional performance on the job. It should also provide sustained and effective performance for LIS graduates without the need for early retraining after graduation. Minishi-Majanja (2004) in her study concluded that LIS schools should increase the time spent on the practical component when teaching ICT modules. Similarly, experimental learning which integrates the use of ICTs should be emphasized in LIS education programmes. The trialability variable from the DOI theory suggest that trial of an innovation dispels uncertainty, and gives individual adopters the chance to evaluate the innovations in terms of how it works and the benefits associated with its use (Rogers, 1995).

Minishi-Majanja (2004) study revealed that effort has been made to integrate ICT applications in teaching and learning in LIS schools in Southern Africa. This however, is still largely supplemental to traditional teaching methods and learning styles. According to

Minishi-Majanja's (2004) findings, very few LIS schools in Southern Africa offer online education and where this is offered, the programmes and modules are highly selective. The study attributed this state of affairs to lack of adequate investment in ICT infrastructure, resources and faculty capacity. Furthermore, Minishi-Majanja (2004:vi) suggested that "ICT use in research is partial". The study recommended that ICTs should be exploited in teaching, learning and research in LIS education and training in Sub-Saharan Africa. In addition, efforts should be made to offer more online classes/courses/programmes (Minishi-Manjaja, 2004). ICT integration in LIS education and training in Southern Africa resembles tuning and adaptations which only result in minor changes in the curricula as assumed in the Punctuated Equilibrium Theory. In addition these changes are being done within the old framework bound by the existing paradigm of LIS education and training (Gersick, 1991). The Punctuated Equilibrium Theory states that what is needed are reorientations and recreations or frame breaking or bending transformations that revolutionize LIS education and training (Gersick, 1991). LIS education and training need to forget the past, and embrace the future to change (Tushman and Romanelli, 1985)

Minishi-Majanja (2004) in her study also observed that lack of ICT competencies among LIS academic staff and students is a major inhibiting factor in ICT adoption and use in LIS education and training, a trend also observed in a study in Kuwait. The study by Buarki, Hepworth and Murray (2011) revealed that ICT adoption in LIS education and training is constrained by lack of faculty expertise. Abudullahi and Kajberg (2004) recommended that LIS teaching staff should understand current trends in the field to inform teaching and research. They should also be responsible for upgrading their education and ICT skills constantly. Similarly, a study by the Educational Testing Service (2006) in the USA reported that college freshmen lacked requisite ICT skills necessary to be successful in their studies. The study attributed the ICT skill gaps in HE students to the slow rate of ICT use in teaching and learning. This prompted Minishi-Majanja (2009) to declare that the more the curriculum and pedagogy is supported by ICTs, the more students without ICT competencies and skills are marginalized. Minishi-Majanja (2009) points out that most HE programmes have introduced Information Literacy Skills (ILS) as a compulsory course tailored to equip students with the requisite competences. It is hoped that the ILS courses make up for students' ICT incapacity.

3.3.5 Resources needs for LIS curricula delivery

Van der Linde and Braak (2011) point out that effective curriculum delivery needs to be supported by adequate and sustainable human, physical and technological resources. They further claim that the availability of resources facilitates attainment of HE goals and targets. Willard and Wilson (2004) argue in the same way, suggesting that adequate ICT infrastructure, bandwidth, computer hardware and software, supporting information policies and regulatory frameworks are requirements for LIS education and training. They claim that availability of resources and ICT infrastructure facilitates sustainable and effective repositioning of LIS education and training programmes in the information/knowledge economy. Additionally the Punctuated Equilibrium Theory also suggests that during revolutionary periods, change efforts might be constrained by time pressures and inadequate resources (Nadler and Tushman, 1995).

Bhasin (2012) noted that the most important resource for any industry is its human resource and the most essential attributes of the workforce are its competencies. He suggested that the effectiveness and viability of LIS education and training programmes is dependent on the competencies of its teaching staff and students (Bhasin, 2012). McKimm (2007) and Bhasin (2012) claimed that LIS faculty and ancillary staff should be appropriately qualified in their specialties and have a working knowledge of the trends in the LIS academic discipline and profession for them to be able to contextualize the students' learning experiences comprehensively. Anwar (2008) argued that LIS teaching faculty is a valuable resource in LIS education and training and recruitment should be based on qualifications and merit. He further argued that LIS faculty design curriculum, develop learning resources, assess students, teach, mentor and mold the final products of LIS education and training, and therefore, their qualifications should be of high standards and constantly updated. This view is reinforced by Stueart (2000) who declared that qualified full time academic staff with constantly updated competencies is integral for the effective delivery of LIS education and training curricula.

Studies by Igwe (2005) and Minishi-Majanja (2004) observed that there is need for re-training of faculty in LIS education and training programmes, in modern theory and principles of teaching and learning, ICT skills and competencies. This is important if they are

to meet the new demands and needs in the profession and the labour market. However, study findings of Ikoja-Odongo (2006) underlined the problem of brain drain as a major obstacle in LIS education and training. The study revealed that staff sent overseas for staff development do not normally return to their jobs or are absorbed by other organizations offering better remuneration and opportunities (Ikoja-Odongo, 2006).

In another study Minishi-Majanja (2004:148) found that generally most LIS departments are small, ranging from as few as three academics to the largest departments having about twenty-four staff members". She further states that the negative implication of these small departments is that, often they are unable to earn enough personnel points for many senior positions such as professors or research fellows" (Minishi-Majanja 2004:148). Thus LIS faculty who wish to be promoted in their career are compelled to leave LIS academic departments and join university administrative work or non academic organizations (Minishi-Majanja, 2004). LIS schools are then forced to depend upon part-time lecturers whose commitment and devotion to teaching and learning as well as research is not guaranteed (Manda, 2006). A study by Singh and Malhan (2010) concluded that lack of highly qualified faculty is a major problem in LIS education and training programmes. The Punctuated Equilibrium Theory suggests that when revolutionary changes occur it is better for an organization to have qualified individuals, as their skills base allows them to learn quickly and adapt without much effort (Mayasari, 2010). Mayasari further states that enskilling an individual with a sound skills base is quicker than training a new individual without prior training. This is slow and takes more time and funding that are scarce resources in organizations in transition (Mayasari, 2010).

There is also need for technical support staff with high level expertise in the maintenance aspects of ICTs. Bhasin (2012) suggests that technical support staff who are able to install, trouble shoot and fix ICT problems, as well as capable of answering requests from users are vital for sustained quality use of ICT resources. Minishi-Majanja (2004) complained that most computers in LIS schools in Sub Saharan Africa are not in use due to poor maintenance and lack of skills to trouble shot and diagnose system problems, as well as lack of parts for service. Minishi-Majanja (2004) claimed that there is lack of enough qualified individuals with ICT specialist skills comparable to the speed at which technologies change in the market.

McLeod (2012) opined that a well developed information infrastructure is a major foundational base for ICT use in teaching and learning. According to Global e-Schools and Communities Initiative (GeSCI) (2008) and McLeod (2012), ICT infrastructure includes: telecommunication and electricity grid networks, ICT policies and regulatory frameworks, ICT capacity, hardware and software, and associated ICT services. Aswalap (2005) stated that there is need for well-developed telecommunication networks in order for ICT use to be well established in Africa. He argued that telephone networks provide the foundational base for building data communication networks that enable access to information, information technology, and the internet. Isaacs (2007) noted that underdeveloped telecommunications network systems and high cost of telecommunication impede ICT use in education. Studies conducted by Farrell, Glen and Isaacs, 2007; Kalanda and De Villiers, 2008) in Africa confirmed this. A study by Manda (2006) maintained that African governments need to develop policies and regulatory frames that deregulate satellite communication and other telecommunication links. He further stated that policies should be put in place to regulate Internet Service Providers (ISPs) and cross-border data flows. Manda (2006) declared that ICT policies and regulatory frameworks might ease the stringent tax regimes prevalent in Africa which consider computers, communication equipment and other ICT peripherals as luxury goods that attract heavy import duties. He further noted that the heavy import duties make ICT equipment and peripherals out of reach.

In addition, Isaacs (2007) and Manda (2006) opined that reliable internet connectivity and access is an important resource in education. Minishi-Majanja (2004) and Manda (2006), in separate studies found that internet access in Africa is concentrated in urban areas but internet efficiency is poor and connectivity downturns are common. Minishi-Majanja (2004) attributed the downturns to poor telecommunication services, low bandwidth, technical faults, cable theft and other network configuration problems. Jensen (2005) stated that in some cases internet access is limited by the number of service points available and by the time during which internet access is available or permitted. Jensen (2005) argued that in education, internet access is no longer a luxury or a privilege: it has become a necessity for research, teaching and learning. Jensen (2005) challenged HEIs to lobby governments to develop adequate ICT infrastructure, telecommunication networks and ICT policies and regulatory frameworks. He argued that HE needs sustainable investments in ICTs, reliable internet connectivity and electricity supply. Irregular power supply obstructs sustainable use of ICT in research and teaching (Jensen, 2005).

Studies conducted by Manda (2006); Zakari (2000); Thapisa (1999) in Africa found that LIS schools lack adequate and dedicated ICT laboratories. This situation is reflected in the number of computers or computer-student ratios in universities or colleges. Minishi-Majanja (2004) declared that computer facilities are centralized, resulting in faculty and students scrambling for the limited resources. Minishi-Majanja (2004) found that 62% of LIS schools in Sub-Saharan Africa have centralized computer laboratories. The study concluded that LIS schools should have departmental laboratories to ease the problem of access to computer laboratories.

LIS education and training is becoming highly reliant on ICTs for teaching and learning purposes (Ocholla, 2008). This calls for adequate and sustainable investments in ICT hardware and software as well as ICT capacity. Zakari (2000) and Minishi-Majanja (2004) claim that LIS education and training programmes need sustained funding. Cronin (1985) claims that technological diffusion in LIS education and training programmes is dependent on sustainable funding. The unequal distribution of funding in HEIs is the major cause of the existing ICTs investment and use disparities. This is the reason why some LIS schools have managed to invest considerably in ICTs while others have not and are dependent on donors for ICT investments (Isaacs, 2007; Minishi-Majanja, 2004). The issue of have and have-nots can be exemplified in the South African context where the historically “former black universities were badly resourced” while the “former white universities were well resourced” in terms of ICT infrastructure and funding (Ngulube, 2006:4).

Easy availability and access to relevant information sources is another critical resource needed in LIS education and training. Bozimo (1985) asserts that literature should be pedagogically sound and relevant to the educational purpose. Rosenberg (2000) pointed out that there is a general lack of teaching and learning materials in the African context. This has resulted in LIS academics in Africa depending largely on foreign published literature for research and teaching (Bozimo, 1985). Bozimo (1985) challenged LIS faculty in Africa to be active producers of LIS context-specific literature through research and publications. The Punctuated and Equilibrium Theory supports this perspective, emphasizing that in revolutionary periods, organizations need sustained free flow of information and novel ideas from and within its environments to support the transition process (Mayasari, 2010).

The library acts as the main hub for teaching and learning resources in institutions of higher and tertiary education (Chakraborty and Sarkhel, 2009). Bozimo (1985) notes that most libraries in Africa are stocked with dated foreign published literature, and attributes the phenomenon to inadequate funding. Rosenberg (2000) claims that up-to-date and relevant library resources are few in HE libraries, resulting in access problems. He further suggests that the inadequacies in current and relevant information sources result in overwhelming demand for the few available library resources. The overwhelming demands usually result in increased theft and mutilation of library resources (Rosenberg, 2000).

McKimm (2007) considers adequate and clean teaching rooms, office, social and study space sufficient to accommodate learners and staff at all stages, as an important resource in LIS education and training. He declares that sufficient and favourable teaching and learning environment, study and social spaces are fundamental resources in LIS education and training. Eleser and Chauvin (1998) substantiate McKimm (2007), reiterating that clean and safe learning environments free from political intimidation and harassment are essential in LIS education and training.

In addition, up-to-date curriculum is considered as a significant resource in delivering LIS curricula (Virkus, 2012), a view also shared by Lawal (2000) when he stated that LIS curricula should be continuously reviewed in line with professional trends. In addition, students are also regarded as fundamental resources in LIS education and training. Lallo (2013) confirmed this, stating that a quality cohort of LIS students is integral for the growth of the LIS profession and its academic discipline. Similarly Galvin (1995) claims that internship positions are a major resource in LIS education and training, while Rogers (1995) opined that time is an integral resource in education.

3.3.6 Awareness of Paradigm shift in the information industry

A paradigm is defined as, “a constellation of facts, theories, methods, and assumptions about reality that allows researchers to isolate data, elaborate theories, and solve problems” (Kuhn, 1996:23). In general terms a paradigm is a comprehensive model of understanding that provides a community of practice with viewpoints and rules on how to look at the field’s problems and how to solve them. Kuhn (1996) posits that as long as a paradigm is successful

at explaining observed phenomena and solving problems, it remains dominant. However, as new trends emerge, anomalies which cannot be explained by the current paradigm are identified, and the paradigm succumbs to increasing doubt. Kendall–Tackett (n.d:1) states that “as the anomalies accumulate some will be labeled as errors, some will make small change to the existing paradigm, and some will lead to revolution”. The advent of the information society/knowledge economy driven by advanced development in ICTs and the World Wide Web has triggered anomalies in the traditional and secured structure of the library, its work model, and its means of providing service (Myburgh, 2005). These anomalies changed the way terminology is defined in the LIS field, how scholars view the subject, what questions are regarded as valid and the education and training curriculum (Cronin, 1983; Sutton, 2001; Mathews, 2011; Myburgh, 2000:2005). These changes according to Kuhn’s (1962/1970) inferences suggest a paradigm shift. A paradigm shift is described as “a reconstruction of the field from new fundamentals, a reconstruction that changes some of the field’s most elementary theoretical generalizations as well as many of its paradigm methods and applications.... When the transition is complete, the profession will have changed its view of the field, its methods, and its goals. (1970/1962: 84–85)

Change starts when scientists observe anomalies- things that do not fit within the prevailing paradigm (Kuhn, 1996). Kuhn (1962; 1970:67) asserts that "awareness is prerequisite to all acceptable changes of theory". He further states that “awareness begins in the mind of the person. What we perceive, whether normal or metanormal, conscious or unconscious, is subject to the limitations and distortions produced by our inherited and socially conditional nature”. According to Rogers (1995) awareness represents knowledge of the innovation’s existence. Knowledge of the existence of the innovation is gained through communication. According to Rogers (2003:5), communication is “a process in which participants create and share information with one another in order to reach a mutual understanding”.

The decision to adopt an innovation is influenced by awareness of the innovation (Sahin, 2006). Rogers (1995) in the DOI Theory postulates that awareness of an innovation is positively correlated to its rate of adoption. He claims that awareness or knowledge about an innovation motivates potential adopters to seek more information about the innovation. Knowledge of the innovation helps potential adopters to develop favourable or unfavourable attitudes towards the innovation, subsequently leading to informed decisions to adopt or not (Sarosa, 2012; Grunwald, 2002). However, Guidolin (2007) claims that most innovations

experience difficulties in the first part of their life cycle. Guidolin attributed the difficulties to limited knowledge about the existence of the innovation and its characteristics (Guidolin, 2007). This therefore implies that lack of knowledge about an innovation within a social system negatively impacts on the rate of adoption of an innovation (Guidolin, 2007). Empirical evidence from Ramzan (2004) confirmed this, stating that librarians in Pakistan are resisting the use of information technologies in their libraries due to lack of knowledge about the effects and benefits of ICT use in libraries. The study concluded that lack of knowledge about the benefits of ICT use in libraries negatively affects diffusion of ICT innovations in Pakistan libraries. Another study by Al-Zahrani (2000) corroborated Ramzan's (2004) findings. Al-Zahrani (2000) claimed that knowledge about the innovation, adopters' educational backgrounds, experiences with the innovation, and individual or group perceptions about the innovation are significant factors in innovation diffusion within a social system.

3.3.7 Attitudes of LIS academics towards changes in the information industry

The world is in the midst of change and professions like LIS are also changing. Change is a difficult process for any living organisms, as change is intricately associated with uncertainty, disruption of established standards and routines and requires relearning (Lotich, 2011). This is also confirmed by empirical research which shows that change is highly guarded in communities of practice (Williams, Coles, Wilson, Richardson and Tuson, 1998; Sam, Othman and Nordin, 2005). Perlman and Takacs (1990) established that change stirs up diverse emotions in individuals such as fear, denial, anger, insecurity, anxiety, resignation, openness, and readiness among members of a community of practice. The negative emotions result in resistance to change (Perlman and Takacs, 1990; Lotich, 2011). In communities of practice resistance to change might be a result of undefined organizational strategy towards change, lack of communication about the perceived need to change, lack of leadership support and commitment, inadequate resources to facilitate the change process, lack of capacity and lack of change management skills (Perlman and Takacs, 1990; Prakash, 2009). The DOI Theory by Rogers (1995) validates claims by Perlman and Takacs (1990) and Prakash (2009) that individual adopters form negative or positive attitudes towards an innovation based on the knowledge they have about the innovation, free flow of information about the innovation, availability and access to the innovation and change agent's efforts to stimulate change. Therefore, knowledge, competencies, resources and leadership support are

facilitative antecedents of innovations. Kotter (1996) suggest that positive attitudes towards change are critical for achieving organizational goals and strategies.

A study by Finlay and Finlay (1996) seeking to establish the relationship between knowledge and individual personalities, found that librarians with knowledge and innovative personalities have favourable attitudes towards the internet. Similarly, Janes (2002) in his study found that reference librarians with digital reference experience had more positive attitudes than those who had no experience. The study concluded that knowledge and experience influence behavior and attitudes towards adoption of new innovations. The findings of a survey of more than 3,000 teachers by Williams et al. (1998) revealed a correlation between levels of use, skills, familiarity, and knowledge of ICT and teachers' attitudes towards use of ICT in teaching and learning.

Similarly Al-Zahrani (2000) investigated the perceptions of 147 LIS professionals and para-professionals concerning information technology innovations and training in university libraries in Saudi Arabia. He found a significant relationship among respondents' educational background, experience in using information technology, and their perceptions about ICTs. The study revealed that librarians in Saudi Arabia have positive attitudes toward use of ICTs in libraries. This was attributed to prior knowledge of ICT use and the perceived benefits of ICT use in libraries. The study concluded that librarians' educational backgrounds and prior knowledge of ICT is significant factors in influencing attitudes toward adoption and use of ICTs. Al-Zahrani (2000) study is consistent with the findings of an earlier study by Williams et al. (1998), which found a significant correlation between levels of use, skills, familiarity, and knowledge of ICT and teachers' attitudes. Rogers (2003:1) claims that "innovations offering more relative advantage, compatibility, simplicity, trialability, and observability are adopted faster than other innovations". However, Rogers cautions that "getting a new idea adopted, even when it has obvious advantages, is difficult" (Rogers, 2003:1).

Ageel (2012) on the other hand declared that ICTs have many benefits in contemporary educational systems, but adoption of ICT-enabled teaching has largely lagged behind. This was attributed to teachers' negative attitudes towards ICT-enabled teaching, dogmas, and ignorant, misinformed and highly negative attitudes towards ICT-enabled teaching (Ageel, 2012). Lotich (2011) recommends that organizations make use of change agents and facilitate the change process, to dispel the negative attitudes and related phobias. Parisot (1995),

Williams et al. (1998), and McKenzie (2001) concurred that if teachers regard technology as adding value to their instructions, have the requisite capacity, resources and know-how they will use ICTs in teaching and learning. Conversely, Ur Rehman (2010) in a study undertaken in Kuwait found that faculty members usually develop a strong sense of ownership for the courses they have been teaching for a long time, and do not like the titles or content to change in any revision exercise. This validates the DOI theory in its claims that old ideas are the main mental tools that individuals use to evaluate new ideas and tools. Rogers further claimed that previous practice provides a framework against which new ideas are interpreted (Rogers, 1995). However, Treuhalt (1995) maintains that faculty must recognize that the world has changed and the old educational system will not solve the problems of the 21st century. Treuhalt (1995) claimed that employers and students have needs that current curricula and educational delivery systems are unable to fulfill. He further declared that curricula and teaching and learning paradigms driven by advanced developments in ICTs need to be adopted in HE.

3.4 Summary of literature review

The literature reviewed suggests that LIS education and training across the globe is in the midst of major revolutionary transformations due to paradigm shifts in the wider society, advanced development of ICTs, changing modes of information production from mode one to mode two, changing information and communication behavior of the society. These shifts have resulted in revolutionary transformations in the LIS profession and its academic discipline in terms of its roles, technologies, work environments and set of skills required. The changes in the society and the LIS profession have compelled the LIS academic disciplines to instigate changes. These changes have revolutionized the goals of LIS education and training, curricula contents, resources needed, faculty capacity required and pedagogical approaches. However, these shifts in training have been received enthusiastically by some individuals while others are cautious, uncertain and resistant to change. The literature reviewed shows that radical educational transformations are looming and the only possible alternative is for educational programmes such as LIS education and training is to change.

Literature reviewed has shown that the subject of LIS education and training has been widely researched and discussed. This has been confirmed by published studies on LIS education and training in South Africa (Ocholla, 2007); Ethiopia (Mammo, 2011); Botswana (Mutula, 2007); Uganda (Okello-Obura and Kigongo-Bukenya, 2011); India (Singh, 2003); Latin America (Arakoki and Vega, 2011); United States (Johnson, 2007); Vietnam (Welch and Murray, 2010); United Kingdom (Andrews and Ellis, 2005); Asia (Miwa, 2006); Australia (Hallam, 2006 and Yu and Davis, 2007). No such study has been done in Zimbabwe. This suggests a major research gap which the researcher has addressed. The study examined the status of LIS education and training in Zimbabwe in the face of paradigm shifts in the information industry. This area of research fills a void in existing literature and scholarly discourse (Creswell, 2002). It also positions LIS education and training in Zimbabwe in scholarly discourse, literature and research.

The theories informing this study are; DOI by Rogers (1995) and Punctuated Equilibrium Theory by Tushman and Romanelli (1995). The DOI by Rogers (1995) and Punctuated Equilibrium Theory by Tushman and Romanelli (1995) have been used before in studying issues in LIS education and training, but the researcher did not retrieve other studies that have integrated both theories in a single study. This suggests a lack of research studies informed by both DOI and Punctuated Equilibrium Theories in a single study in LIS education and training literature. The integration of these theories in this study expands knowledge and use of DOI and Punctuated Equilibrium Theory to LIS education and training. Therefore, this study extends research in LIS education to new ideas and research practices (Creswell, 2002).

Furthermore, the question of the ill preparedness of LIS graduates has been discussed in literature but is under explored in empirical studies. This suggests a major research gap which the researcher has addressed. This study extends the alleged criticism that LIS graduates are not industry to scholarly research. Furthermore, although the subject LIS education and training is an oversubscribed area in literature there is insufficient literature on the goals of LIS education and training. This study therefore, contributes to this research gap.

This study evaluates the available resources for delivering LIS curricula and the effects of resource inadequacies on the production of quality LIS graduates. The study therefore, contributes to a gap in existing literature on the relationship between resources and quality of graduates produced by LIS education and training programmes (Creswell, 2002).

Additionally many researchers in LIS education and training have combined qualitative and quantitative methodologies and adopted the case study and survey designs and their accompanying methods (Yu and Davis, 2007; Virkus, 2008; Murray, 2009; Arakoki and Vega, 2011; Okello-Obura and Kigongo-Bukenya, 2011). This suggests that integrating qualitative and quantitative methodologies and case study and survey designs in a single study is an established practice in LIS education and training research. This study, therefore, contributes to the qualitative and quantitative methodologies and case study and survey research designs. The study replicates research methodologies and attendant methods previously used by other researchers with new respondents in new research sites (Creswell, 2002).

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

Research methodology is described as systematic frameworks which researchers use in research studies to describe, understand, explain and predict research phenomena. The purpose of this is to provide a work plan of the research study (Rajaseka, Philominathan and Chinnathambi, 2006) and ground the study within the large body of philosophical assumptions, methodologies, design strategies and methods.

The purpose of the study was to assess LIS education and training in Zimbabwe in the context of paradigm shift in the information industry and to assess how the indicators of change, mostly at the global level, reflect the interplay of these factors in Zimbabwe. The study is guided by seven specific research questions:

1. What are the goals of LIS education and training in Zimbabwe?
2. What competencies are encapsulated in LIS curriculum?
3. What LIS skills are needed by the information industry?
4. What is the extent of ICT integration in the LIS curriculum?
5. What human and physical resources are available for delivering LIS curriculum?
6. What is the level of awareness by LIS faculty regarding paradigm shifts in the information industry?
7. What are the attitudes of LIS academics towards the changes in the information industry?

The chapter is organized into ten sections. Section 4.2 reviews the common philosophical assumptions in research and the post positivism framework informing the study, section 4.3 discusses the research approach; section 4.4 outlines the research design. Section 4.5 delineates the population of the study, section 4.6 explicates data collection methods, section 4.7 gives a brief synopsis of how data is presented and analyzed, section 4.8 discusses credibility and trustworthiness, section 4.9 summarizes the ethical considerations observed in this study, and section 4.10 provides a summary of the chapter.

The study adopted a post positivist framework where combined qualitative and quantitative methodologies are appropriate. The qualitative perspective was dominant and the quantitative complementary. The case study approach was adopted and the respondents within the cases were surveyed. The goal of the study is not to generalize the findings but to have an in-depth understanding of issues in LIS education and training within a context. As a result, the purposive sampling technique was adopted. The data collection methods selected for use in this study reflects the philosophical and methodological underpinnings informing the study. Similarly data analysis and presentation techniques used in this study conform to both qualitative and quantitative paradigms. The language of the post positivist research paradigm was integrated in the study and hence the study discusses credibility and trustworthiness rather than validity and reliability.

4.2 Research paradigms

The major goal of research whether qualitative or quantitative is either to predict, describe or explain a phenomenon and contribute to the body of knowledge within the context of a philosophical belief (Lawal, 2009). Philosophical beliefs are commonly known as research paradigms and they have major implications on how knowledge is studied and interpreted (Mertens, 2005). McGregor and Murnane (2010:419) define a paradigm as a “set of assumptions, concepts, values, and practices that constitutes a way of viewing reality for the community that shares them”. Willis (2007:8) describes a paradigm as a “comprehensive belief system, world view, or framework that guides research and practice in a field”.

Taylor and Medina (2013) state that there are three perspectives entrenched in research paradigms: these are epistemology, ontology and methodology. Tuli (2011) describes ontology as the beliefs about the nature of reality and humanity; epistemology as the theory of knowledge that informs the research and methodology informs how that knowledge may be gained. Thus, ontology, epistemology and methodology give shape and definition to the conduct of an inquiry (Tuli, 2011). This view is espoused also by Burke (2007) who asserts that research paradigms act as a ‘set of lenses’ and assist the researcher to view the problem under study within a particular set of established assumptions.

There are many research paradigms which can be used to inform research studies in LIS education and training. Different scholars have categorized research paradigms differently. For example, Guba and Lincoln (2005:54) identified four paradigms: positivism, post-positivism, critical theory and constructivism while Crossan (2003) and Zammito (2004) suggest two broad categories: positivism and post-positivism. Conversely, Parahoo (2006); Alaranta (2006) and Kim (2003) added interpretivism, modernism and postmodernism to those identified by Crossan (2003). In addition Mackenzie and Knipe (2006) propose the transformative research paradigm and pragmatism whereas Raskin (2009) recognizes phenomenology and constructivism. Mackenzie and Knipe (2006) assert that the LIS discipline does not hold one particular paradigm as greater than the other. Most research studies in LIS are positioned according to the dictates of the philosophical underpinnings popularly used at that particular time or relevant to a study. This study reviewed two relatively opposing paradigms: positivistic and post-positivistic. This stance is supported by Crossan (2003) and Zammito (2004) who believe that there are two broad epistemological positions in research positivism (believers in scientific methodology) and post positivism (rejecters of scientific methodology) and within these spectrums lie the other schools of thought.

4.2.1 Positivism

The positivism paradigm is regarded as the traditional scientific or quantitative approach (Denzin and Lincoln, 2005 and Polit and Beck, 2006). Easterby-Smith, Thorpe and Lowe (2002:28) state that positivism is grounded in a research philosophy that proclaims that the: –social world exists externally, and that its properties should be measured through objectives methods, rather than being inferred subjectively through sensations, reflection or intuition”. Within the positivistic framework, the goal of science is to develop the most objective methods possible to get the closest approximation of reality (Tuli, 2011). This framework maintains that reliable knowledge is based on direct observation or manipulation of natural phenomena through empirical, often experimental, means (Lincoln and Guba 2000; Neuman, 2003) and the positivist framework is fixated on standardized subjects, statistical analysis, and scientific explanation of cause and effect (Hammersley, 1995).

Scholars in the social sciences have criticized the positivist framework for being inadequate in researching social issues or human beings (Ryan, 2006). Cohen (2006) asserts that relations observed in laboratories or controlled settings may not be the same in the complicated external world where a much greater number of factors interact. This view is shared also by Ryan (2006) who declared that the scientific approach which positivism espouses is rightly thought to be inadequate when it comes to learning about how people live, how they view the world, how they cope with it, how they change it. Dissatisfaction with the positivist doctrines among social scientists led to the evolution of the post positivistic school of thought challenging the philosophies of positivism.

4.2.2 Interpretivism

The interpretivist research paradigm originated from the philosophy of Edmund Husserl's phenomenology and Wilhelm Dilthey's and other German philosophers' study of interpretive understanding called hermeneutics (Mertens, 2005:12). The role of the interpretivist paradigm in research is to understand "the world of human experience" (Cohen and Manion, 1994:36) in their context. The interpretivist research paradigm was birthed out of discontent with the positivist paradigm in social sciences. The underlying philosophical assumptions underpinning the interpretivist research paradigm is that reality is socially constructed and fluid (Cohen and Crabtree, 2006). There is no single correct route or particular method to what is known (Willis, 1995). What is known is always negotiated within cultural frameworks, social settings, relationships with other people (Robert Wood Johnson Foundation, 2008) and therefore, there is no objective reality but multiple valid claims to knowledge (Cohen and Crabtree, 2006).

The interpretivist researchers tend to rely upon the "participants' views of the subject being studied (Creswell, 2003:8). The interpretivist researcher uses mainly naturalistic methods (interviews, observations and document analysis/review (Robert Wood Johnson Foundation, 2008). These methods allow interaction between the researcher and the research respondents within social settings and this allows mutual collaborative construction of multiple valid claims to knowledge based on social reality (Cohen and Crabtree, 2006). Reality is therefore, socially constructed through language, consciousness and shared meanings (Myers, 2009). The interpretivist research paradigm uses either

qualitative and quantitative methods or mixed methods. The quantitative methods may be used to support or expand upon qualitative methods (Mackenzie and Knipe, 2006).

4.2.3 Post positivism

The post positivism paradigm challenges the positivist traditional notion that there is only one truth, an objective reality that exists independent of human perception (Phillips and Burbules, 2000) and postulate that there are many ways of knowing reality apart from the scientific methods (Robinson, 2009; Cohen, 2006). Within the post positivist framework “reality is multiple, subjective, and mentally constructed by individuals” (Crossan, 2003:54). Contrary to positivist claims to absolute truth, proponents of post-positivism are concerned with establishing and searching for a “warranted assertibility”, that is, evidence that is valid and sound proof for the existence of phenomena (Forbes, King, Kushner, Letourneau, Myrick, and Profetto-McGrath, 1999).

Within the post positivist perspective, researchers regard themselves as “people who conduct research among other people, learning with them, rather than conducting research on them” (Wolcott, 1990:19). In post-positivist research, “truth is constructed through a dialogue; valid knowledge claims emerge as conflicting interpretations and action possibilities are discussed and negotiated among the members of a community” (Wolcott, 1990:19). Researchers do not ask themselves “is this the truth?” Rather, “we talk about the issues raised during the interviews, the participants’ reactions, and our interpretations of these interwoven ideas” (Richie and Rigano, 2001:752).

This study adopted the post positivist framework because the nature of the issues under enquiry (LIS education and training in Zimbabwe and paradigm shift in the information industry) is complex, evolving and therefore, requires interactive dialogue with participants to establish a deeper understanding of the phenomenon (Wolcott, 1990). The change process under scrutiny in this study requires capturing direct and lived experiences of respondents (Stewart and Floyd, 2004), a practice recommended by Stewart and Floyd (2004) who declared that direct experiences can be better understood using post positivist reflections. Ryan (1999) stated that post positivism permits researchers to present a narrative that

balances personal and professional experiences and theoretical interpretation with a compelling story. A post positivist framework allows the researcher to combine both qualitative and quantitative methodologies. A combined approach enables the methodologies to complement individual limitations and exploits respective benefits (Shenton, 2004). It also enables the researcher to integrate narrative and statistical techniques to analyze and present data.

However, it is important to note that there are scholars who are skeptical of the whole notion of research paradigms for example, Clough and Nutbrown (2007) who argue that grouping research methodologies into distinct paradigms is not always helpful as it can lead to artificial or uncritical characterization. Clough and Nutbrown (2007) suggest that rather than adopting a particular approach, researchers should apply combinations of valuable features of research approaches to tackle the task at hand. They further assert that the critical issue in research is to demonstrate that the methodology suits both the context and purpose of the enquiry. Despite these assertions, this study adopted the post positivistic philosophical underpinnings to inform the study. The researcher in this study adopted the post positivist research paradigm despite Clough and Nutbrown's stance on use of research paradigms in research studies. The post positivist research paradigm provided the researcher with a thinking framework that guided the behaviour of the researcher throughout the course of study. It also helped the researcher to view the problem under study within a particular set of established assumptions, methodologies and research approaches (Burke, 2007). Furthermore use of research paradigms in research studies is regarded as one of the virtues of true scholarship and it also play an important role in building a researcher identity (Lukka, 2010).

4.3 Research approach

Pickard (2007); Robinson (2009; McGregor and Murnane (2010) concur that research paradigms are accompanied with attendant methodologies. Research scholars like Lin (1998); Williams (1998); Mackenzie and Kipe (2006) and Morgan (2007) equated quantitative to positivism and qualitative to interpretivism and succeeding schools of thought. These suppositions have been refuted by Rowlands (2005) and Mertens (2005) arguing that such categorization is quite misleading. Rowlands (2005) argued that qualitative research can be very empirical in nature if the methodology informing the research is positivistic, while

Mackenzie and Knipe (2006:203) stated that “some paradigms may appear to lead a researcher to favour qualitative or quantitative approaches, in effect no one paradigm actually prescribes or prohibits the use of either methodological approach”. Mackenzie and Knipe (2006) further argued that for any research to be fully effective, it is inevitable that, both approaches need to be applied. They point out that research which eschews the use of both qualitative and quantitative research approaches, is impoverished.

This study is grounded in a post positivist philosophical framework in which a combined approach qualitative and quantitative are deemed appropriate (Collins, Onwuegbuzie and Jiao (2006); Hughes (2006); McGregor and Murnane (2010); Tuli (2011). However, in this study the qualitative perspective dominated and the quantitative was complementary. Evidence in literature indicates that it is possible to combine qualitative and quantitative methods without violating philosophical principles (Tashakkori and Teddlie, 2003). Hughes (2006); Guba and Lincoln (2005) explicitly state that they have no objection to combining methods, as long as there are no attempt to combine paradigms. Bryman (1988) argued for a ‘best of both worlds’ approach and suggested that qualitative and quantitative approaches should be combined.

4.3.1 Quantitative research

Creswell (2003:19) defines quantitative research as an approach to inquiry “in which the investigator primarily uses positivist claims for developing knowledge (that is cause and effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the test of theories)”. Quantitative purists believe that social occurrences should be treated as entities in much the same way that physical scientists treat physical phenomena (Tuli, 2011). The quantitative research paradigm is based on testing a theory, measured with numbers, and analyzed using statistical techniques (Creswell, 2007). Quantitative research is fixated usually with numbers, proportions and statistics, and is invaluable for measuring people’s attitudes, their emotional and behavioural states and their ways of thinking (Shields and Twycross, 2003). The goal of quantitative methods is to generalize findings and contribute to theory that allows the researcher to predict, explain and understand some phenomenon (Creswell, 2007 and Neuman, 2011).

The statistical techniques used in quantitative research allow for sophisticated analyses and the research process to be replicated (Hughes, 2006). However, the quantitative approach

fails to take into account people's unique ability to interpret their experiences, construct their own meanings and act on these (Hughes, 2006). Equally the mechanistic tenet of the quantitative approach tends to exclude notions of freedom, choice and moral responsibility (Hughes, 2006).

4.3.2 Qualitative research

Qualitative research involves “studying things in their natural settings, attempting to make sense of, or interpret phenomenon in terms of the meanings people bring to them” (Denzin and Lincoln, 2000:3). Qualitative purists contend that reality is subjective, multiple and socially constructed by its participants (Krauss, 2005 Lincoln and Guba 2000). Research in this framework is conducted in a natural setting and involves a process of building a complex and holistic picture of the phenomenon of interest (Denzin and Lincoln, 2000). The qualitative approach is engrossed in meanings, concepts, characterization, metaphors, symbols and description of things (Creswell, 1994).

The researcher used the qualitative enquiry to study the change process in LIS education and training in its natural settings. The interactive and participatory data collection methods allow the researcher to understand the nature and complexity of the innovations taking place in LIS education and training. This qualitative methodology enables the researcher to collect in-depth data about people's perceptions, opinions and feelings and valuable information about the subject under study (Anderson, 2006 and Hughes, 2006). The close involvement of the researcher with the respondents of the study allows the researchers to discover subtle issues that are often neglected by the scientific methodologies (Hughes, 2006). Kerlinger (1986:348) identified three major weaknesses of qualitative research: “the inability to manipulate independent variables; the risk of improper interpretation; and the lack of power to randomize”. These problems were addressed through combining qualitative and quantitative approaches in this study so that the methodologies complemented each other. Delamont opined that “qualitative research is more difficult more stressful and more time-consuming than quantitative research and it is suitable for people who care about it, take it seriously, and are committed to social research” (Delamont, 1992:viii). In the qualitative framework there are no measurements or statistics. Instead the research relies heavily on the use of narrative and quotes to explore meaning (Shields and Twycross, 2003 and Mutch, 2005). The qualitative aspect of this study was facilitated through the use of in-depth

interviews, document review and open ended survey questionnaires, further discussed in the data collection methods section 4.6 in this study.

4.3.3 Mixed methods

The phrase mixed research methods has diverse meanings and implications to different scholars and writers. Scholars like Creswell, Plano Clark, et al., (2003); Onwuegbuzie and Teddlie (2003) view mixed methods as research techniques or methods of collecting and analyzing data. While others regard mixed research methods as a research methodology and research focus (Tashakkori and Teddlie, 1998), a research designs with philosophical assumptions and methods of inquiry (Creswell, 2006). This study adopts Creswell's definition of mixed methods:

Mixed methods are a research design with philosophical assumptions as well as method of inquiry. This methodology, involves philosophical assumptions that guides the direction of the collection and analysis of data. It involves the mixture of qualitative and quantitative approaches in the research process. This method focuses on collecting, analyzing and mixing both quantitative and qualitative data in a single study. Its central premise is that the combination of quantitative and qualitative approaches provides a better understanding of the research problems (Creswell, 2006:5).

The use of mixed methods in research has gained importance in research in humanities and social sciences. This has been attributed to the flexibility and diversity of world views. Mixed methods provide researchers with the flexibility of moving from one methodology (quantitative or qualitative) to another without the restrictions of operating in confined quantitative or qualitative silos. Mixed research methods enable researchers to tackle wicked (complex) problems in research. The Swedish Morphological Society (2013:2) defines wicked problems in research as “research problems that are ambiguous and associated with strong moral, political and professional issues”, that are difficult to study in linear methods and a single research approach (quantitative or qualitative) (Creswell, 2006). The diversity of the methodological approaches in mixed methods allows the researcher to address and solve the problems in a single research study. Furthermore mixed methods encourage research collaboration across research designs and disciplines previously thought of as incompatible (Creswell, 2006). Although the values of using mixed methods research are many, mixed

research is difficult for novice researchers; as it is time consuming, expensive, confusing and complicates the whole research procedure (Creswell, 2006; Onwuegbuzie and Teddlie, 2003).

It is for these reasons that the researcher in this study combined the qualitative and quantitative approaches in a single study. The qualitative approach was dominant and the quantitative was complementary. This was done to obtain detailed perspectives and understanding of the innovations and the issues in LIS education and training in Zimbabwe. This approach enabled the researcher to collect detailed inside views from individuals with genuine interests in the subject. Using both quantitative and qualitative research methods allowed the researcher to produce detailed and quality data; reduce bias and increased validity; and consequently produced more robust results than could not be easily accomplished using a single approach (Anderson, 2006 and Hughes, 2006). The quantitative approach was also used to offset the gaps in the qualitative approach (Hughes, 2006). Qualitative and quantitative methodologies were combined to increase the validity of the study and allowed the researcher to integrate both narratives and descriptive statistics in data presentation and analysis. It also enabled the researcher to develop new lines of thoughts as new perspectives and contradictions emerged from the data (Anderson, 2006 and Hughes, 2006). The addition of some quantitative evidence in qualitative results augments the generalizability of the findings (Hughes, 2006).

4.4 Research design

The study integrated case study and survey research methods (Creswell, 2008; Gable, 1994; Yin, 1994). Punch (2006:48) defines a research design as the ~~basic~~ plan for a piece of empirical research and it includes five main ideas: strategy, conceptual framework, who or what will be studied and the tools and procedures for data collection and analysis". Punch (2006) points out that a design connects the research questions, the data production procedure and the final data produced. Marsh (1982) and Yin (1994) claim that both case study and survey designs are not synonymous with a particular research paradigm or data collection techniques. However, questionnaires are widely used in case studies and surveys but other data collection techniques such as structured and in-depth interviews, observation, and content analysis for example are also appropriate (Marsh, 1982).

4.4.1 Case study

Yin (1994) describes a case study as an empirical inquiry, in which the focus is on a contemporary phenomenon within its real-life context. The study used a holistic case study with embedded units. The holistic case study is Zimbabwe and the embedded unit's are institutions offering LIS education and training: NUST, ZOU, Harare, Bulawayo and Joshua Nqabuko Nkomo Polytechnic Colleges. The use of a holistic case study with embedded units enables the researcher to explore the subject under study within a case; between cases and cross-cases (Yin, 2003). The ability to look at sub-units that are situated within a larger case is powerful as data can be analyzed within, between and or across the subunits and this allows the researcher to engage in rich analysis and illuminate the subject under study (Yin, 2003). The case study design is useful when investigating new, complex and evolving issues as evident in LIS education and training, where one method cannot adequately address the salient aspects (Keen and Packwood, 1995). The major pitfall of this approach is that novice researchers analyze data at the individual subunit level and fail to return to the national issue that they originally intend to address (Yin, 2003). Efforts were made to analyze the data in this study holistically.

4.4.2 Survey

Surveys can be free-standing or can be embedded in larger research designs such as ethnographies, case studies, or experimental research (Gable, 1994). Yin (1994) maintains that questionnaires, face-to-face interviews, and focus groups all belong to the rubric of survey research. The survey design was selected because it allows methodological pluralism and it sanctions multiple data collection techniques such as in-depth interviews, observation, questionnaires and content analysis (Creswell, 2008). Conversely, surveys are renowned for their ability to collect data at low cost from a population which is geographically dispersed. The five cases (NUST, ZOU, Harare, Bulawayo and Joshua Nqabuko Nkomo Polytechnic Colleges) are geographically dispersed and as a result the researcher felt obliged to adopt the survey method (Creswell, 2008). Other researchers in the field of library and information science investigating similar issues have used surveys which have yielded reliable and valid data. This includes Minishi-Majanja (2004); Harvey (2010); and Gerolimos (2009); therefore the researcher regarded the survey design as appropriate for the study.

4.5 Population of the study

The purpose of this study was to assess LIS education and training in the context of the paradigm shift in the information industry and to assess how the indicators of change, mostly at the global level, reflect the interplay of these factors in Zimbabwe. This study is focused on key stakeholder groups in LIS education and training comprising of LIS academic faculty; Deans/ Heads of Departments (Deans/HODS); LIS final year students (who have completed the internship programme in the LIS industry for a period of one year); and LIS employers (major libraries). These groups were targeted in this study due to their expertise, authority, experience, responsibilities and interest in the problem under study (Pickard, 2007).

According to the NUST website, the LIS department has fifteen faculty and the ZOU websites states that the LIS department has ten faculty (NUST, 2012 and ZOU, 2012). The prospectuses of Harare, Bulawayo and Joshua Nqabuko Nkomo polytechnic colleges' state that the staff establishment of the LIS department at Harare Polytechnic is ten; Bulawayo eight and Joshua Nqabuko Nkomo four (Harare, 2007; Bulawayo, 2013 and Joshua Nqabuko Nkomo, 2009). The total population of LIS academics is forty seven. The five institutions offering LIS education and training are headed by five Deans/HODS.

The list of LIS employers in Zimbabwe was provided by the Zimbabwe Library Association (ZimLA) (see Appendix 6). LIS major employers comprised twelve university libraries; two special libraries (United States Information Services (USIS) and the British Council Library); one national library (represented by the National Archives of Zimbabwe); two public libraries (Harare City Libraries and Bulawayo City Libraries). The total number of libraries selected as major employers of LIS professionals was seventeen.

NUST final year students who had completed a one year internship period numbered 66; ZOU students were excluded from the study as the internship period is less than a year (twelve weeks). Harare Polytechnic had 48, Bulawayo 24, and Joshua Nqabuko Nkomo 12 final year students respectively. The total number of final year students was 150. The population of the study is summarized in table 4.

Table 4 Population of the study

Institutions	Population			
	Deans and HODs	Faculty	Final year students	LIS employers
National University of Science and Technology	1	15	66	
Zimbabwe Open University	1	10	–	
Harare Polytechnic College	1	10	48	
Bulawayo Polytechnic College	1	08	24	
Joshua Nqabuko Nkomo Polytechnic College	1	04	12	
Major LIS employers (ZimLA)				17
Total	5	47	150	17

4.5.1 Sampling procedure

Seventeen LIS employers were purposively selected. A census was done of LIS faculty and Deans/HODs. LIS final year students were randomly selected and the simple random technique was considered appropriate. The sampling techniques are further discussed below.

4.5.2 Purposive sampling

The purposive sampling technique was considered to be the most viable technique for this study because the purpose of the study is not to generalize but to get depth, complex and rich data sources that facilitate understanding of the issues (Powell and Connaway 2004). Furthermore, the purposive sampling technique represented a practical means by which to solicit input from respondents who have lived experiences in LIS education and training, and who have well formed attitudes, opinions, interests, and knowledge about the trends in the profession and the LIS academic discipline. Merriam (2009) claim that the purposive sampling technique is renowned for producing appropriate data filled with insights of knowledgeable, experienced, interested and affected parties, resulting in acceptable and reliable outcomes. In addition the purposive sampling technique is also recommended in large scale surveys where the elements are not easily determined (Babbie, 2005 and Burns and Grove, 2005). The number of major LIS employers was not easily determined, and

therefore this sampling technique was considered appropriate to this group of respondents. The Zimbabwe Library Association considers libraries that employ ten or more LIS professionals as major employers. From the list of major employers provided by the Zimbabwe Library Association the researcher purposively selected a representative sample of major employing libraries inclusive of university libraries, public libraries, national libraries, and specialized public libraries.

4.5.3 Census method

A census of LIS academics and Deans/HODs was done. Israel (2009) recommended this approach. He noted that it is advisable to conduct a census for a small population as it eliminates sampling error and provides data on all the individuals in the population. Surveying the entire population enables the researcher to achieve desirable levels of precision (Israel, 2009). This is reinforced further by Research Advisors (2006) in their published sample size table (see table 5). Whitehead and Annells (2007) suggest that a common range of between eight and fifteen participants is deemed adequate in qualitative research although this may vary. Conversely, Speziale and Carpenter (2003) suggest that the number of respondents in a qualitative study is dictated by data saturation and usually a sample size ranges from five to fifty. In the same manner the Research Advisors (2006) published sample size table indicating that if the total population is less than a hundred it is advisable to conduct a census. The total population of LIS faculty and Deans/HODs was less than 100 and the researcher considered it appropriate to conduct a census as recommended by Speziale and Carpenter (2003); Research Advisors (2006); Whitehead and Annells (2007).

4.5.4 Simple random sampling

The researcher obtained lists of final year students who have completed internship programmes in LIS work environments for a period of one year from the registrars of participating institutions (see Appendix 7 for attached lists). NUST final year students were sixty six; [ZOU students were excluded in the study as the internship programme is only for twelve weeks]; Harare, Bulawayo and Joshua Nqabuko Nkomo Polytechnic Colleges had forty eight, twenty four and twelve final year students respectively. The total number of LIS final year students was hundred and fifty. According to the Research Advisors (2006) sample size table, the appropriate sample population which can be drawn from the total population of

150 final year student was 108 with a 5% margin of error and a confidence level of 95%. The Research Advisors (2006) sample size table is shown in table 5.

Table 5 Sample size table

Required Sample Size [†]								
Population Size	Confidence = 95%				Confidence = 99%			
	Margin of Error				Margin of Error			
	5.0%	3.5%	2.5%	1.0%	5.0%	3.5%	2.5%	1.0%
10	10	10	10	10	10	10	10	10
20	19	20	20	20	19	20	20	20
30	28	29	29	30	29	29	30	30
50	44	47	48	50	47	48	49	50
75	63	69	72	74	67	71	73	75
100	80	89	94	99	87	93	96	99
150	108	126	137	148	122	135	142	149
200	132	160	177	196	154	174	186	198
250	152	190	215	244	182	211	229	246
300	169	217	251	291	207	246	270	295
400	196	265	318	384	250	309	348	391
500	217	306	377	475	285	365	421	485
600	234	340	432	565	315	416	490	579
700	248	370	481	653	341	462	554	672
800	260	396	526	739	363	503	615	763
1,000	278	440	606	906	399	575	727	943
1,200	291	474	674	1067	427	636	827	1119
1,500	306	515	759	1297	460	712	959	1376
2,000	322	563	869	1655	498	808	1141	1785
2,500	333	597	952	1984	524	879	1288	2173
3,500	346	641	1068	2565	558	977	1510	2890
5,000	357	678	1176	3288	586	1066	1734	3842
7,500	365	710	1275	4211	610	1147	1960	5165
10,000	370	727	1332	4899	622	1193	2098	6239
25,000	378	760	1448	6939	646	1285	2399	9972
50,000	381	772	1491	8056	655	1318	2520	12455
75,000	382	776	1506	8514	658	1330	2563	13583
100,000	383	778	1513	8762	659	1336	2585	14227
250,000	384	782	1527	9248	662	1347	2626	15555
500,000	384	783	1532	9423	663	1350	2640	16055
1,000,000	384	783	1534	9512	663	1352	2647	16317
2,500,000	384	784	1536	9567	663	1353	2651	16478
10,000,000	384	784	1536	9594	663	1354	2653	16560
100,000,000	384	784	1537	9603	663	1354	2654	16584
300,000,000	384	784	1537	9603	663	1354	2654	16586

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In order to obtain representative proportional sample sizes for the four institutions NUST, Harare, Bulawayo and Joshua Nqabuko Nkomo Polytechnic Colleges the researcher calculated the proportional sample size as follows:

NUST $66/150 \times 108 = 47.52$

Harare $48/150 \times 108 = 34.56$

Bulawayo $24/150 \times 108 = 17.28$

Joshua Nqabuko Nkomo $12/150 \times 108 = 8.64$

Total 108

According to the mathematical calculations, the numbers of the proportional sample size for each institution were NUST 48, Harare, Bulawayo and Joshua Nqabuko Nkomo Polytechnics 35, 17 and 9 respectively. The 150 LIS final year students population for the year 2013 were then classified using numbers ranging from 001 up to 150 and a representative sample size of 108 LIS final year students was randomly selected. The total population and drawn sample population are summarized in table 6.

Table 6 Relative sample of respondents

Targeted respondents	Total population	Sample population	Sampling method used
Deans/HODS	5	5	Census population
LIS academic faculty	47	47	Census population
LIS final year students	150	108	Simple random
Major LIS employers	-	17	Purposive

4.6 Quantitative and qualitative data collection methods

The goal of data collection in any enquiry is to generate data that is of exceptional quality (Polit and Beck, 2010). Parahoo (2006) and Creswell (2009) assert that collecting data in combined qualitative and quantitative research requires methods that are flexible and varied. This perspective is espoused also by Ishak and Bakar (2012) who assert that numerous types of data collection methods provide strong evidence to support the researchers' hunches. Ishak and Bakar (2012) urge qualitative researchers to be innovative in seeking the best data collection methods for their study. Multiple methods were used to collect data, and these include survey questionnaires, in-depth interviews, and document review. These methods were deemed appropriate to the philosophical and methodological underpinnings of the study and the survey and case study designs adopted. Throughout the data gathering process, partial data analysis was as an ongoing process, in order to detect data gaps and formulate remedial measures (Polit and Beck, 2010).

4.6.1 Qualitative data collection methods

In-depth interviews have been widely used in LIS research. In-depth interviews were used to collect qualitative data. The interview schedules were divided into sections derived from the

specific research questions of the study. Scholars like Head, Van Hoeck, Eschler and Fullerton (2013); Virkus and Uukkivi, 2013; Smith (2009); Miwa (2006); Hallam (2006); Yu and Davis (2007); and Mammo, (2007); have used interviews before and have managed to collect reliable qualitative data. Qualitative data were collected for a period of four months April 2013 to July 2013. An interview schedule comprising open ended questions was used to interview five Deans/HODS and seventeen LIS employers. All the interviews were face to face and were conducted by the researcher. In-depth face-to-face interviews allowed the researcher to obtain additional information from body and facial expressions. Open-ended questions were utilized to enable the respondents to respond in their own words. This allowed for richer and more complex data to be collected (Whittemore and Grey, 2006).

Permission was sought before the interviews. Prior to the interview session respondents were asked to read and sign the consent forms which clearly specified that participation was voluntary and respondents were free to decline participation at anytime. The respondents were assured of anonymity and confidentiality (Polit and Beck, 2010). Each interviewee was free to select the place and venue for the interview. This is recommended by Davies (2007) who asserts that the researcher must be able to engage with the interviewees in a setting of their choice that is relaxed, familiar and conducive. Davies suggested that the interview setting should be free from distractions and suitable for the participant to talk freely about possibly emotional and confidential matters. Interview schedules were used to keep the researcher focused on the objectives of the study (Powell and Connaway, 2004).

Each group of respondents was asked relatively the same questions and probes were used to elicit detailed data, clarification and explanations (Shenton, 2004). Furthermore, iterative questioning was used, in which the researcher returns to matters previously raised by an informant and extracts related data through rephrased questions (Shenton, 2004). When contradictions emerged or falsehood detected (through conflicting responses), the researcher decided either to discard the suspect data or use it (Shenton, 2004). To eliminate thematic and technical differences, all interviews were conducted by the researcher (Polit and Beck, 2010).

Permission to audio tape the interview was sought from the respondents (Verma and Mallick, 1999) and all respondents agreed to allow this. The interviews were audio recorded and the

researcher wrote supplementary notes to offset equipment errors and faults. Audio taping the interviews enabled the researcher to pay full attention to the participant's non-verbal responses such as inflections of the voice which can be an additional and valuable source of information, as well as obtaining a verbatim transcript for analysis (Verma and Mallick, 1999). Recording interviews allowed the researcher to have a permanent record of the interview sessions which can be woven into the analysis and it also helped in reducing researcher's bias as a result of poor notes or faulty memory of the interview (Pickard, 2007). The proposed duration for the interview was thirty minutes but the researcher did not stick to this time frame due to variations in the respondents' abilities and individual needs. Cormack (2000) points out that time restrictions hinder the free flowing nature of the interview. All tape recorded data was duplicated and backup copies filed in case of damage. After each interview, the researcher compiled notes to supplement the recorded raw interview and these were textual translations of the lived experience of each interview session. Each interview session was transcribed verbatim using Microsoft Word 2010 and the qualitative data was loaded into NVivo 10 for analysis.

An interview framework previously used by Yu and Davis (2007) and Miwa (2006) was adapted to suit the study context and objectives (see Appendix 1-4). Borrowing questions previously used in other studies is a common practice in research (Olsen, 1998). Adapting questions previously used in other studies is well-known for comparability of data collection instruments and findings (Olsen, 1998). In addition, Olsen claims that adapted instruments are considered reliable and valid as they have been previously tested for validity and reliability. However, the adopted instruments were further pretested for the purpose of testing the ability of the questions to collect the desired data, and adapting the questions to the context of the study (Caspar and Peytcheva, 2011). Further adjustments were made based on the results of the pretest.

4.6.2 Quantitative data collection methods

Quantitative data were collected through survey questionnaires. Forty seven LIS faculty and one hundred and eight final year students were surveyed using different questionnaires designed to collect both qualitative and quantitative data. Closed ended questions produced quantitative data. Survey questionnaires enabled the researcher to collect anonymous and

confidential data cheaply from a geographically dispersed population and gather responses in a standardized manner (Pickard, 2007). The questionnaires were divided into sections; each section covered a particular theme from the specific research questions of the study. The study adapted questionnaires previously used by Yu and Davis (2007) and Miwa (2006). Questionnaires have been used before in LIS education and training in studies by Kennedy and Brancolini (2011); Mammo (2011); Al-Daihani (2011); Okello-Obura and Kigongo-Bukenya (2011) and Singh (2003) and are therefore, established techniques for data production in the field.

Instructions were clearly written on the questionnaires and the respondents were assured of confidentiality and anonymity. Different kinds of questions were used in the questionnaires: open ended and closed ended questions, filter questions, matrix questions and the likert type scale (Polite and Beck, 2010). The researcher distributed the questionnaires in person to the respondents in different regions. This was done to avoid postage delays and this enabled the researcher to become familiar with the study areas and respondents (Polit and Beck, 2010). Polit and Beck further claimed that familiarizing with respondents enables the researcher and respondents to build mutual relationships, earn the trust of the respondents, and consequently boost the response rate. The researcher made it clear that respondents were free to withdraw from the study at any time without providing reasons (Shenton, 2004). This was done to ensure that respondents volunteered and were prepared to offer data freely (Polit and Beck, 2010).

Survey questionnaires were administered within a period of four months (April to July 2013) and there was no need for the researcher to spend time at the institutions once the instruments were distributed (Creswell, 2003). However, it was relatively easy to collect data from LIS final year students. This was collected personally and with the help of colleagues. However, it was very difficult to collect data from LIS faculty and numerous follow ups were done before questionnaires were returned. The researcher attributed this to survey fatigue (tired of responding to surveys) and lack of motivation or incentives to respond to questionnaires among LIS faculty (Polit and Beck, 2010). The completed questionnaires were collected and the responses were edited to ensure completeness, consistency and readability. Data from open ended questions were cleaned, coded and standardized (Neuman, 2003). Emerging trends and patterns within the data were visible from the onset and numerical data obtained

through this approach facilitated comparisons between organizations or groups, as well as determining the extent of agreement or disagreement between respondents (Yauch and Steudel, 2003). Quantifiable data from the questionnaires were coded into the Statistical Package for Social Sciences (SPSS) 20th edition for analysis.

4.6.3 Document reviews

Document review was also used to collect qualitative data. LIS curricula documents from NUST, ZOU and Polytechnic colleges (Polytechnic Colleges use a national curriculum) were reviewed to collect valuable qualitative data to answer the second specific question of the study: (what competencies are encapsulated in LIS curricula). Permission was sought to secure access and release of the documents from the relevant institutions (Centers for Disease Control and Prevention (CDC), 2009). The document review method enabled the researcher to collect data free from respondents reactivity effects (CDC, 2009). This method enabled the researcher to gather behind the scene data that could not be obtained through interviews and questionnaires (CDC, 2009). Data collection through document review is time consuming and tedious (WBI Evaluation Group, 2007).

A document review checklist was developed based on relevant theoretical variables and the specific research question guiding the study (see appendix 5). The checklist was used to systematically interrogate LIS curricular documents (WBI Evaluation Group, 2007). Data collected through document review was coded and loaded in NVivo 10 for qualitative analysis. Table 7 summarizes the data sources, data collection methods and data analysis strategies used in this study.

Table 7: Data sources and strategies for collecting data and analysis

Research question	Respondents	Source of data	Data generated and analysis strategies
What are the goals of LIS education	LIS Deans/HODS	In-depth interview/survey questionnaires	Nvivo (thematic data)
		Survey questionnaires	SPSS (Descriptive statistics)
What competencies are		Document review	Nvivo (thematic data)

Research question	Respondents	Source of data	Data generated and analysis strategies
encapsulated in LIS curriculum			
What LIS skills are needed by the information industry?	LIS employers	In-depth interview	Nvivo (thematic data)
	LIS final year students LIS faculty	Survey questionnaires	SPSS (Descriptive statistics)
What is the extent of ICT integration in the LIS curriculum?	LIS faculty	Survey questionnaires	SPSS (Descriptive statistics)
	LIS Deans/HODs	In-depth interviews	NVivo (thematic data)
What human and physical resources are available for delivering LIS curriculum?	LIS faculty	Survey questionnaires	SPSS (Descriptive statistics)
	LIS Deans/HODs	In-depth interviews	NVivo (thematic data)
		Document reviews	NVivo (thematic data)
What is the level of awareness by LIS faculty regarding paradigm shifts in the information industry?	LIS faculty	Survey questionnaires	SPSS (Descriptive statistics)
		In-depth interviews/ Survey questionnaires	Nvivo (thematic data)
What are the attitudes of LIS academics towards the changes in the information industry?	LIS faculty	Survey questionnaires	SPSS (Descriptive statistics) NVivo (thematic data)

4.7 Data analysis and presentation

Traditionally, as noted by Creswell and Plano (2007:128), “Data analysis in mixed methods research consists of analyzing the quantitative data using quantitative methods and the qualitative data using qualitative methods”. Hughes (2006) points out that analysing qualitative data involves continual interplay between theory and data, a view espoused also

by Powell and Connaway (2004), who asserted that data analysis in qualitative studies is cyclical. They further stated that it is an ongoing process that feeds back into the research design right up to the last moment of data gathering. Qualitative data from the interviews, survey questionnaires and document reviewed were analyzed also using NVivo 10 and generated thematic data presented in thematic form. Quantitative data was analyzed using SPSS 20 and generated descriptive statistics presented using pie charts, bar graphs and columns.

Quantitative data from survey questionnaires was coded, cleaned, standardized and keyed in into SPSS 20. Themes were developed in the data view section of SPSS 20 based on the questions in the research instruments. The themes were cross referenced to ensure that a system of trail of evidence was visible and traceable to the original source questionnaire (Yin, 1994). In the variable view section, the responses from the questionnaires were then keyed into SPSS 20. SPSS 20 was used to compute and analyze the data and descriptive statistics were generated. These were presented in the form of tables, pie charts and bar graphs.

Audio-taped interviews were transcribed verbatim and the data cleaned and captured into Microsoft Office Word 2010. Data can be transcribed directly from audio into NVivo 10 however, the researcher decided to transcribe data using Microsoft Office Word 2010 because of the absence of spell-check facility in NVivo 10 (Eynden and Chatsiou, 2011). Eynden and Chatsiou claim that the absence of spell-check in NVivo10 negatively affects transcription quality (Eynden and Chatsiou, 2011). The individually transcribed interviews were coded using pseudonyms and were downloaded in the data sources section in NVivo 10. Using NVivo 10 the researcher developed theme categories commonly known in NVivo 10 as data nodes, also described by Prasad (2008:11) –as compartments or –pigeon holes” with explicitly stated boundaries into which the units of content are coded for analysis”. The content categories were molded from the specific research questions and questions in the data collection instruments. This was influenced by Prasad (2008) belief that every thematic category must be completely and thoroughly defined, indicating what should be included and excluded. Chadwick, Bahar and Albrecht (1984) emphasized that thematic categories must be mutually exclusive and comprehensive enough so that all units examined fit. Data nodes were extracted from the interview transcripts and diverse nodes were extracted from each transcript

until saturation of all thematic categories of nodes was achieved (Prasad, 2008). The data nodes were merged to form a series of thematic categories for each specific research questions and scrutinize for emerging themes within and across questions (Yin, 1994). Seven major themes emerged from the data. The themes were presented thematically in narrative form supported by verbatim extracts from relevant interviews and questionnaires. NVivo 10 enabled the research to manage large quantities of data easily, and facilitated new levels of analysis (Gerbic and Stacey, 2005 and Davies, 2007).

4.8 Credibility and trustworthiness

In the post positivist framework, researchers endeavor to achieve trustworthiness through credibility (instead of internal validity), transferability (instead of external validity), dependability (instead of reliability) and conformability (instead of objectivity) (McGregor and Murnane, 2010:24). Guba and Lincoln (2005) and Morrow (2005) state that credibility in qualitative research can be achieved through prolonged engagement with participants; use of well-established research methods; use of multiple methods for data collection, and the study's openness to suggestions.

Prior to commencement of the study, the researcher familiarized herself with the culture of participating organizations to gain an adequate understanding of the organization and establish a relationship of trust (Lincoln and Guba, 1985). However, the researcher avoided becoming engrossed in the institution's culture and politics: this was done to avoid influenced judgments (Silverman, 2000). Also the researcher adopted well established research methods previously used in comparable studies by LIS scholars in South Africa (Raju, 2013); Ethiopia (Mammo, 2011); Uganda (Okello-Obura and Kigongo-Bukenya, 2011); India (Kumar, Jain and Shah, 2013 and Singh, 2003); Latin America (Arakoki and Vega, 2011); Vietnam (Welch and Murray, 2010); Asia (Miwa, 2006); Europe (Virkus, 2008); Australia (Hallam, 2006 and Yu and Davis, 2007).

Constructive criticism from peers, colleagues, academics and feedback from conferences and cohort seminars were integrated in the study (Shenton, 2004). The diverse perspectives offered by peers, colleagues and academics allowed the researcher to refine assumptions, methods, develop a greater explanation of the research design, and strengthen arguments

(Shenton, 2004). These constructive comments helped the researcher reduce prejudices, as closeness to the study often obstructs the researcher's ability to view the study with real detachment (Shenton, 2004).

This study is dominantly qualitative and therefore cannot be generalized (Morrow, 2005). However, Morrow (2005) argues that if the research strategy, instruments, context, process, participants and researcher-participants relationships were well elaborated, transferability can be achieved in a qualitative study. The research strategy, procedure and methods were reported in detail to enable the study to be replicated (Shenton, 2004).

Dependability deals with the "manner in which the study was conducted, consistency, and the data analysis techniques used" (Gasson, 2004:94). The researcher kept an audit trail for the study. A detailed chronology of research activities and processes; influences on the data collection and analysis; emerging themes, categories, and analytic memos were kept (in the form of a research journal) (Morrow, 2005:252). McGregor and Murname (2010) assert that if events in a research study can be audited, and the influences and actions of the research are accounted, then the research study is regarded as trustworthy.

Miles and Huberman (1994) consider confirmability as the extent to which the researcher admits his or her own biases. The researcher is a product of LIS education and training programmes in Zimbabwe (Harare Polytechnic and National University of Science and Technology). She has been a member of staff at Harare Polytechnic and a part time lecturer at the Zimbabwe Open University. All these institutions participated in the study. Some of the respondents were the researcher's former students, colleagues or lecturers. To minimize the power dynamics in the relationship of the interviewer and interviewee in the study, the researcher ensured that the study focused on its objectives. A view also backed by Gasson (2004:93) who notes that "findings should represent, as far as is (humanly) possible, the situation being researched rather than the beliefs, pet theories, or biases of the researcher".

4.9 Ethical considerations

Ethical considerations in this study were addressed adhering to Winter's (1996:16-17) list which itemizes a number of principles which should be addressed by a researcher. These include:

- all participants should be allowed to influence the work;
- the wishes of those who do not wish to participate must be respected;
- the development of the work must remain visible and open to suggestions from others;
- permission must be obtained before making observations or examining documents produced for other purposes;
- description of other's work and point of view must be negotiated with those concerned before being published; and
- the researcher must accept responsibility for maintaining confidentiality".

The study adhered to the policies stipulated by the University of KwaZulu-Natal on research ethics (University of KwaZulu-Natal, College of Humanities Handbook, 2012). The proposal and ethical clearance documents were submitted to the Higher Degrees Committee of the University of KwaZulu Natal for approval. The Higher Degrees Committee of the University of KwaZulu Natal approved the proposal and an ethical clearance was granted (see Appendix 8). Approval to conduct the research study in the identified institutions was sought and permission to conduct research was granted from the Ministry of Higher and Tertiary Education, ZOU, and NUST (see Appendix 9-11 for letters of induction, request and approval).

The participants in the study were informed about the study's objectives and their right to consent or decline participation (Polit and Beck, 2010). Participants were asked to sign consent forms in the presence of the researcher (see Appendix 12) and prior to commencement of data collection procedures. The signed consent forms were collected by the researcher for submission to the University of KwaZulu Natal. All respondents were assured of confidentiality at all times and participants' identities were not disclosed in the study report (Polit and Beck, 2010). Other peoples' work and ideas used in this study were

acknowledged. The final thesis was tested for plagiarism using turnitin software and an originality report was issued by the university.

After completion and acceptance of this thesis, the completed questionnaires, interview schedules, tape records, document review checklists, signed consent forms, and data outputs from SPSS 20 and NVivo 10 were handed to the University of KwaZulu-Natal in accordance with the ethical requirements for safe keeping for a period of five years. After five years data will be destroyed either through shredding or burning by the University of KwaZulu Natal.

4.10 Summary

The chapter discussed the philosophical underpinnings embedded in the chosen methodologies, both qualitative and quantitative. The rationale for the researcher's choice of research paradigm and methodology was discussed. The chapter also discussed the research design used; the methods adopted for the study; the rationale for adopting the methods as well as the data analysis procedures; trustworthiness issues and ethical considerations undertaken in the study. It also outlined the steps the researcher took to accomplish the study objectives.

CHAPTER FIVE

DATA ANALYSIS AND PRESENTATION

5.1 Introduction

This chapter focuses on the presentation and analysis of data obtained from questionnaires, in-depth interviews and document reviews. Data analysis is defined as a ~~–~~systematic search for meaning. It is a way to process qualitative and quantitative data so that what has been learned can be communicated to others. Analysis means organizing and interrogating data in ways that allow researchers to see patterns, identify themes, discover relationships, develop explanations, make interpretations, mount critiques, or generate theories. It often involves synthesis, evaluation, interpretation, categorization, hypothesizing, comparison, and pattern finding. Researchers always engage their own intellectual capacities to make sense of qualitative and quantitative data” (Hatch, 2002:148). Quantitative data from the questionnaires was analyzed using SPSS and qualitative data was analyzed using NVivo. However, Weitzman (2000) state that the software will not read the text and decide what it means; the researcher is still the main tool for undertaking this analysis (Weitzman 2000). Data outputs from SPSS and NVivo were analyzed and presented using themes derived from the research questions.

The chapter has five sections. Section 5.2 discusses the response rate, section 5.3 analyzes and presents data based on seven major themes derived from the specific research questions, section 5.4 discusses the broader issues of HE, and section 5.5 summarizes the chapter.

The purpose of this study was to assess LIS education and training in Zimbabwe in the light of the paradigm shift in the information industry and to assess how the indicators of change, mostly at the global level, reflect the interplay of these factors in Zimbabwe. The study addressed seven specific questions. These questions are as follows:

1. What are the goals of LIS education and training in Zimbabwe?
2. What competencies are encapsulated in LIS curriculum?

3. What LIS skills are needed by the information industry?
4. What is the extent of ICT integration in the LIS curriculum?
5. What human and physical resources are available for delivering LIS curriculum?
6. What is the level of awareness by LIS faculty regarding paradigm shifts in the information industry?
7. What are the attitudes of LIS academics towards the changes in the information industry?

5.2 Response rates

The methodological chapter presents and analyzes four groups of respondents who were involved in the data production process: Deans and HODs, LIS faculty, LIS employers, and LIS final year students. Each group had its own data collection tool. A total of 47 survey questionnaires were distributed to LIS faculty and 108 survey questionnaires were also issued to LIS final year students across five institutions providing LIS education and training in Zimbabwe. Five interview requests were sent through e-mail to Deans and Heads of Departments in LIS education and training institutions and 17 e-mails were also sent to LIS employer's requesting for an interview. The response rates are presented in table 8.

Table 8: Response rate

Targeted respondents	Sample population	Response rate	Data collection methods
Deans/HODs	5	5 (100%)	In-depth interviews
LIS faculty	47	31 (65.9 %)	Survey questionnaire
LIS final year students	108	72 (66.6%)	Survey questionnaire
LIS employers	17	17 (100%)	In-depth interviews

Table 8 shows that among Deans/HODs a 100% response was achieved; meanwhile out of the 47 LIS faculty 31 responded to the study and a 65.9 % response was attained. Likewise of the 17 intended LIS employers all managed to participate in the study and a 100% response was realized. Out of the 108 LIS final year students 72 responded and a response rate of 66.6% was achieved. In addition three LIS curricula offered in Zimbabwe were analyzed.

5.3 Data analysis

Data was presented based on the seven specific questions of the study and relevant theoretical variables gleaned from the theories informing the study. Relevant literature was used to corroborate the findings.

5.3.1 Goals of LIS education and training in Zimbabwe

The study sought to determine the goals of LIS education and training. The ~~deep~~ "structure" variable in the Punctuated Equilibrium Theory by Tushman and Romanelli (1985) informs the research question. Gersick (1991:14) defines ~~deep~~ "structure" as ~~the~~ set of fundamental "choices" a system has made of (1) the basic parts into which its units will be organized and (2) the basic activity patterns that will maintain its existence". The deep structure is what the organization wants to convey to the public and its stakeholders (Gersick, 1991). Five facets are used to explain the deep structure:

- (1) ~~Core~~ beliefs and values regarding the organization, its employees and its environment.
- (2) Strategy (products, markets, technology and competitive timing).
- (3) The distribution of power.
- (4) The organization's structure.
- (5) The nature and type of pervasiveness of control system (Gersick, 1991:14).

Gersick (1991); Tushman and Romanelli (1985) claimed that the deep structure is the control system which limits organizational change during equilibrium periods.

The specific research question was addressed through one sub question in the research instruments:

1. What are the goals of LIS education and training programmes in Zimbabwe?

HODs/Deans in LIS education and training programmes were asked to answer the question: What are the goals of LIS education and training programmes in Zimbabwe? They generally identified five goals namely: teaching and learning, research, community service, stimulating use of and research about ICT and stimulating entrepreneurial culture. The responses of the

Deans/HODs reflected mixed views. These views are illustrated by the use of verbatim quotes which indicate their varying levels of remarks on the goals of LIS education and training in Zimbabwe.

All five HODs/Deans interviewed emphasized teaching and learning as the major goals of LIS education. This was aptly captured by one dean. She noted, “Our core function is teaching and learning and the emphasis is on equipping LIS graduates with a broad knowledge base”. Another added research and community service stating,

...Knowledge production through research and community service is a central goal in LIS education and training however, due to the socio-economic meltdown in the country and brain drain, we tend to focus on the teaching and learning aspects rather than research and community service.

Yet another HOD brought in the aspect of stimulating use and research about ICT and stimulating entrepreneurial culture as goals of LIS education stating, “... to stimulate use and research about current ICTs to enhance and inform LIS practice as well as stimulating an entrepreneurial culture among LIS graduates”.

The findings therefore, underlined the goals of LIS education and training as: teaching and learning, research, community service, stimulating use and research about ICT, and stimulating entrepreneurial culture. Three of the identified goals: teaching and learning, research and community service/engagement are widely recognized as the core purpose of higher education institutions in literature (MacGregor, 2011; Okello-Obura and Kingo-Bukenya, 2011; SARUA, 2008a; and Heim, 1986). The incorporation of goals such as stimulating use and research about ICT, and stimulating entrepreneurial culture signify a new trend towards reframing of new educational vision and aspirations in LIS education and training. Cheng (2001a) confirmed this trend noting that HE is pursuing new visions and goals such as life-long learning, global networking, international outlook, and use of information and communication technology.

The shift in the goals of LIS education and training to include goals such as stimulating use and research about ICT, and stimulating entrepreneurial culture reflect a punctuation

(revolutionary change) in the deep structure (goals) of LIS education and training. The punctuation might have been triggered by internal or external misalignment in LIS education and training (Tushman and Romanelli, 1985). A closer analysis of the findings shows that the punctuations in the goals of LIS education and training are due to external perturbations associated with advanced developments in ICTs and perceived environmental demands. ICTs are competency-destroying innovations (Tushman and Romanelli, 1985).

Furthermore, the addition of the goal “to stimulate entrepreneurial culture” is driven by economic imperatives in the country. Given the socio-economic crisis in Zimbabwe, this goal is intended to foster creativity and entrepreneurial thinking skill sets which are highly associated with employment creation. Empirical studies have confirmed that entrepreneurship education has been found to generate employment and sustainable economic growth (Raimi and Towobola, 2011). The findings suggest LIS education and training is responding to perceived national needs.

Additionally, the statement of one of the deans, “...we tend to focus on the teaching and learning aspects rather than research and community service” signified a trend towards placing teaching and learning ahead of research and community service goals in LIS education and training institutions. The dean’s statement corroborates what other scholars have found for example, Heim (1986); MacGregor (2011); SARUA (2008a) concur that there is tendency in HEIs to place teaching and learning ahead of research and community service/engagement. This suggests that an organization’s core beliefs and values define its, values, strategy and organizational structure as inferred in the Punctuated Equilibrium Theory (Tushman and Romanelli, 1985).

The findings also signified that although research is regarded as one of the goals of LIS education and training in Zimbabwe, it is not prioritized. Closer examination of the findings indicates lack of mentorship and research infrastructure to support research activities. A question in the instruments which required LIS faculty to indicate if they have published in scholarly journals revealed that the majority of LIS faculty (77.4%) has not published in scholarly journals while a minority (22.6%) has published. Those who have published have published in foreign scholarly journals or national journals that ceased publication more than three decades ago. The findings suggest low levels of knowledge production among LIS

faculty in Zimbabwe, a view shared also by Bozimo (1985) who concluded that there is little evidence of knowledge production in LIS departments in Africa. The Punctuated Equilibrium Theory suggests that during a revolutionary period, organizations require free flow of information from and within its environments to support the transition process (Tushman and Romanelli, 1985).

The data also suggests that although community service is listed as one of the goals, it is not emphasized in LIS education and training. Findings from a series of empirical studies have shown that this is not unique to the Zimbabwean context but it is in fact a regional phenomenon with only slight variance in the causative factors. Empirical studies by MacGregor (2011) and SARUA (2008a) also confirmed that the participation of HEIs, in community service/engagement is limited and the goal is more of a fantasy than reality in HE.

The findings from this specific research question indicated that the goals of LIS education are: teaching and learning, research, community service/engagement, stimulating use and research about ICT to enhance practice and stimulating entrepreneurial culture in LIS graduates. However, the findings show that the goal of teaching and learning is emphasized more than research and community service/engagement. Stimulating use of and research about ICT and stimulating entrepreneurial culture shows a pattern of transformation suggested in the Punctuated Equilibrium Theory by Tushman and Romanelli (1985).

5. 3.2 Competencies encapsulated in the LIS curricula

The study also sought to address the research question –“What competencies are encapsulated in LIS curricula?” The question was aimed at determining the competencies encapsulated in LIS curricula. The –deep structure” variable as discussed above informs the question.

The specific research question was answered through three sub questions included in the research instruments:

1. How are LIS education and training programmes articulated in Zimbabwe?
2. How are LIS education and training programmes accredited in Zimbabwe?
3. What are the competencies encapsulated in the LIS curricula?

a) Articulation of LIS education and training programmes

The question –How are LIS education and training programmes articulated in Zimbabwe?” was used to interrogate LIS education and training curricula. The question sought to determine the structure of LIS education and training qualifications. The findings revealed that LIS education and training programmes are organized according to: (1) Nature and type of qualifications offered (Diplomas, Bachelor degrees or Masters); (2) Duration and credits requirements (one or four years); (3) The education model (TVET, undergraduate, and post graduate); (4) Mode of instruction (conventional or non-conventional contact or distance); (5) Orientation of the programme (TVET or general education). The results are further presented in table 9.

Table 9 Articulation of LIS education programmes

Institution	qualifications	Duration/ Requirements	Study mode	Mode of instruction	Orientation of the programme
National University of Science and Technology (NUST)	Doctor of Philosophy (PhD) degree in LIS	3 years full time 5 years part-time	By research	Contact/ Distance	Specialized
	M Phil in LIS	2 years fulltime 3 year part-time	By research	Contact/ Distance	Specialized
	Master of Science Degree in Library and Information Science	2 years Coursework and Thesis	Block release	Contact	General education
	Post Graduate Diploma in LIS (PGDLIS)	18 month Coursework Thesis	Block release	Contact	General education
	Bachelor of Science Honours Degree in	4 years Coursework Thesis Practicum	Full time and Part time	Contact	General education

Institution	qualifications	Duration/ Requirements	Study mode	Mode of instruction	Orientation of the programme
Zimbabwe Open University (ZOU)	Library and Information Science				
	Doctor of Philosophy (PhD) degree in LIS	4 years Research	By Research	Contact/ Distance	Specialized
Polytechnic Colleges	Bachelor of Library and Information Science	4years Coursework Thesis Practicum	Part time	Distance	General
	Bachelor of Technology Degree in Library and Information Science (BTech LIS)	2 years Coursework Thesis	Block release	Contact	TVET
	Higher National Diploma (HND) in LIS	1 year Coursework Thesis	Full time and Part time	Contact	TVET
	National Diploma (ND) in LIS	3 years Coursework Practicum	Full time and Part time	Contact	TVET
	National certificate (NC) in LIS	1 year Coursework	Full time and Part time	Contact	TVET

The data revealed that LIS education and training institutions offer seven levels of qualifications: four levels of undergraduate qualifications (certificate, diplomas, higher diplomas and bachelor degrees) and three levels of post graduate qualifications (graduate diplomas, masters and doctoral degrees). Minishi-Majanja and Ocholla (2004) also confirmed this trend in LIS education and training. Minishi-Majanja and Ocholla (2004) stated that LIS

schools in South Africa offer three levels of undergraduate programmes and four levels of post graduate programmes.

A closer examination of the data revealed that there is no established curriculum for doctoral studies in LIS education and training programmes in Zimbabwe. This was attributed to lack of capacity to offer higher degrees among HEIs offering LIS education and training in Zimbabwe. This was substantiated by the research data which show that there is one LIS faculty with a doctoral qualification in Zimbabwe and the faculty holds a non teaching administrative post. The finding suggests a trend towards a broad-based undergraduate qualifications and a narrow base for post graduate qualifications in LIS education and training programmes in Zimbabwe. The findings confirm Minishi-Majanja's (2009) claim that in most African countries, the need seems to be for lower qualifications. Minishi-Majanja (2009) attributed this to poor remuneration and recognition for highly qualified workers in public service. Additionally, the dominance of lower qualifications suggests lack of capacity to offer higher degrees in LIS education and training programmes in Zimbabwe. The undergraduate and post graduate qualifications characterize the structure of LIS education and training qualification. Tushman and Romanelli (1985) in the Punctuated Equilibrium Theory claim that the organizational structure formalizes roles, relations and hierarchies. The qualification structure represents the fundamental choices LIS education and training programmes have made, the basic parts into which its units are organized and the basic activity pattern that maintain its existence (Gersick, 1991). The undergraduate and postgraduate qualifications signify what LIS education and training offers to the public and its stakeholders (Gersick, 1991).

In addition the data revealed that the undergraduate qualifications (National Certificate and National Diploma) are characterized with lower order competencies needed for the day to day operations of information centers and libraries. The Higher National Diploma, Undergraduate Degrees and Postgraduate Diplomas symbolize medium order competencies essential in middle management positions, whereas, masters and doctoral degrees signify higher order competencies needed for top managerial positions, research, consultancy and lecturing.

Table 9 also shows that the duration and credit requirements vary by institution and orientation of the LIS programmes. Duration of qualifications in TVET programmes are: NC – one year; ND – three years; HND – one year; and BTech – two years. The duration of university qualifications are: undergraduate degree programmes - four years; Post graduate diploma – two years; Master's degree/M Phil – two years full time and three years part time and PhD three years full time and five years part time.

Additionally, the findings indicate that research and practicum are compulsory components of LIS education and training programmes. Practicum is a compulsory requirement at undergraduate levels (diploma and first degree), while research is a requirement at both undergraduate (HND and first degree) and post graduate levels (Post Graduate Diploma, Masters and Doctoral Degrees). The duration for practicum is commonly one year for all conventional LIS programmes and for distance education it is twelve weeks. The discrepancy might be attributed to the fact that conventional programmes recruit LIS graduates straight from secondary schools while distance education programmes recruit LIS graduates with prior qualifications, knowledge and experience in the field. The findings substantiate Prigogine and Stengers (1984:154, 287) assertion that, “systems with deep structure have different parts that comprise them. The parts work together for the good of the system in order to exchange resources with the environment in ways that maintain and are controlled by this differentiation”.

Table 9 revealed three dominant educational models used in LIS education and training in Zimbabwe: TVET, undergraduate, and the post graduate model. These educational models form an important part of the deep structure of LIS education and training. The findings validate the Punctuated Equilibrium Theory which maintains that a business model is a significant part of the deep structure as it frames the organization's culture, strategy, and control system.

Table 9 also indicates that the dominant mode of instruction in LIS education and training programmes is mainly contact (NUST and TVET) and distance/open learning (ZOU). Further analysis of the data indicate that NUST and TVET provide conventional LIS education and

training while ZOU provides distance and open learning design to meet the needs of practitioners who want to upgrade their qualifications. The findings confirm Tushman and Romanelli (1985) claim that a system is bound by other expectations and needs from its environments.

The data also revealed that all post graduate LIS education programmes are provided on block release basis. The finding suggests that there are no full-time postgraduate studies. Further examination of the data revealed that many LIS graduates do not proceed to postgraduate education after undergraduate studies: instead they seek employment and later proceed to post graduate education. The finding is in accord with Feather's (2003:41-42) assertion that "affordability of full-time study by students is an issue, and therefore, full time post graduate education becomes less attractive in the LIS sector". Raju (2013) agreed with Feathers (2003), noting that it is even harder for LIS graduates in developing countries to enroll in full time post graduate studies.

b) Accreditation of LIS education and training

The question of how LIS education and training programmes are accredited in Zimbabwe was used to interrogate LIS curricula. The researcher used this question to ascertain the control systems in LIS education and training. The findings imply that LIS schools in university settings have the autonomy to determine the internalities of their education programmes in an individual manner while TVET LIS programmes lack autonomy. Further examination of the findings show that the TVET LIS curricula is synchronized nationally through the Higher Education Examinations Council (HEXCO) with the exception of the BTech degree at the Harare Polytechnic College which is offered in partnership with NUST. The results are in line with Tushman and Romanelli (1985) fifth facet of the "deep structure" which posits that organizations have control systems in place that limit or permit organizational change. Thus, the findings suggest that HEXCO, NUST and ZOU represent the control systems in LIS education and training programmes and these organizations reserve the right to alter, amend or replace LIS education curricula.

Evidence from the data also signifies the absence of a national accreditation body for LIS education and training programmes. Further examination of the findings revealed that lack of

a national accreditation body and active professional association body is a major obstacle for standardization, uniformity of curricula, and recognition of qualifications across institutions, collaboration, and the development of continued education programmes. The findings support Tushman and Romanelli's (1985:175) claim that "the nature, type and pervasiveness of control systems indicate an organization's emphasis on efficiency".

c) Competencies encapsulated in LIS curricula

The question, "What competencies are encapsulated in the LIS curricula?" was used to interrogate LIS curricular documents. The question sought to ascertain the competencies encapsulated in the LIS curricula. The findings revealed nine broad competencies: foundational or core; technological; business/managerial; communication and community services; "work place competencies and interpersonal skills; legal framework for practice; practicum; research; and specialized competencies. The findings are presented in figure 3.

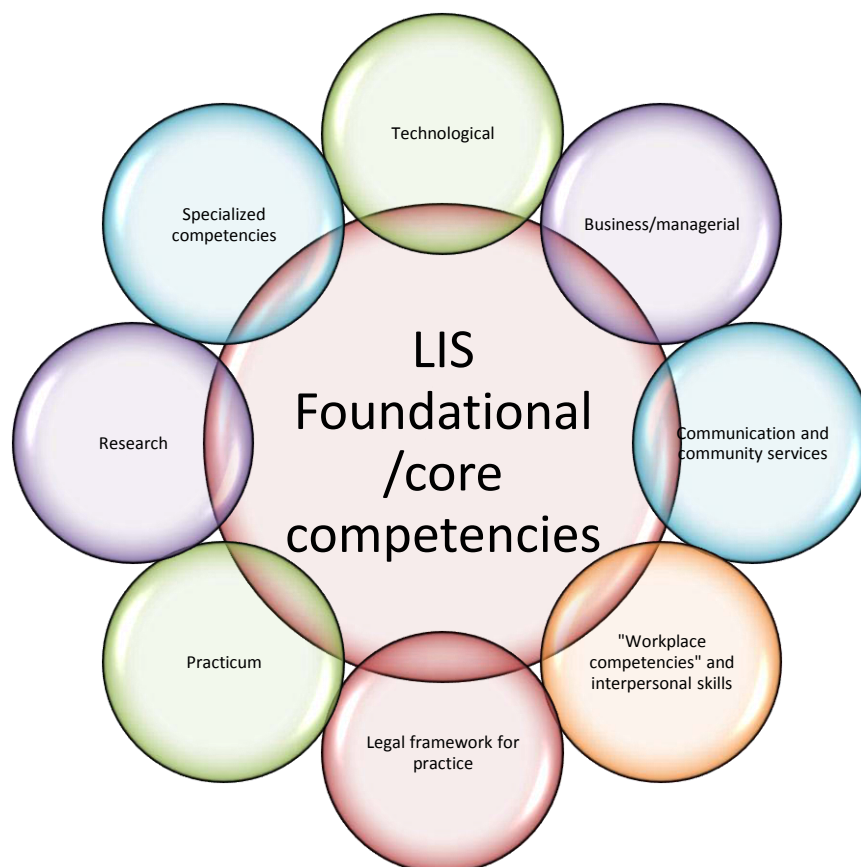


Figure 3 LIS foundational/core competencies encapsulated in LIS curricula (Source: the researcher)

Results shown in figure 3 revealed that the LIS foundational/core competencies include: technological; business/managerial; communication and community service; ~~work place~~ and interpersonal skills; legal framework for practice; practicum; research; and specialized competencies. These were encapsulated in LIS education and training curricula. At the core of the schema lie LIS foundational core competencies comprising LIS traditional technical competencies, ICTs and other supportive competencies integral in contemporary information work. These competencies form the deep structure and embody the core belief and values regarding LIS education and training programmes, ~~its~~ employees, its environments and its products, market, technology and competitive timing” (Tushman and Romanelli, 1985: 176). The findings confirm the Punctuated Equilibrium Theory inferences that the ~~deep~~ structure of organizations represent its core beliefs and values regarding the organization, its employees, and its environment; products, markets, technology, and competitive timing” (Tushman and Romanelli, 1985: 176).

However, the data revealed that continued education, and lifelong learning were not vital components of LIS education and training programmes in Zimbabwe, as recommended in the IFLA published competency framework. This suggests that LIS education and training programmes in Zimbabwe do not conform or ascribe to any published competency framework. However, the data show that most of the competencies encapsulated in LIS curricula fall within the groupings of IFLA, ALA and CILIP published competency frameworks. The finding is consistent with Lester and Van Fleet’s (2008) observation that competencies encapsulated in LIS curricula globally often fall within the categories of the competencies listed in published competency frameworks.

Furthermore, the findings also suggest that the competencies encapsulated in LIS education and training curricula have expanded. The demands that are creating the expansions in LIS curricula are incessant and new subjects have been integrated as core competencies. This is a characterization of an emerging paradigm shift, of which expansion of the curriculum is one of the many indicators. In addition, the findings signify the adoption and use of new innovations in LIS. The new innovations have competency-destroying traits that have destroyed traditional LIS technical competencies specifically. This characterizes a revolutionary period predicted for example, in the Punctuated Equilibrium Theory. The finding confirms Tushman and Romanelli’s (1985) claim that a revolutionary period disrupts

an equilibrium period and dismantles the deep structure. In addition, the finding certifies assertions by Tushman and Anderson (1986) and Lyytinen and Rose (2003) that the introduction of disruptive, or competency destroying ICT innovations interrupts the existing status, destroying the existing deep structure.

The data suggest that there is no standardized approach to what is taught and how the ICT competencies are taught in LIS education and training programmes. The data show that ICT competencies are integrated as stand alone courses or as a component of an established subject. In other instances they are regarded as introductory courses while in other cases they are part of the practical (hands-on) courses in the curricula. The finding suggests that what is taught and how it is taught is subject to interpretations in areas of emphasis, available resources and the knowledge of the curriculum designers and lecturers. The findings are in accord with Ngulube's (2006) claim that there is no uniform approach to what is taught and how it is taught in LIS ICT courses in South African.

The findings show that the depth and mastery of the competencies encapsulated in LIS curricula vary according to institutional orientation and level of qualification. Universities, due to the semesterisation system, tend to focus on general competencies, while, TVET programmes emphasize mastery of applied or hands-on competencies and skills. This was clearly apparent in the frequency and duration of the competencies in the LIS curricula. A closer analysis of the data shows that in universities, competencies were taught over a minimum duration of twelve weeks and maximum duration of twenty four weeks. The minimum duration of study in TVET is one year and the maximum duration is three years. These variations signify the core values and belief of LIS education and training programmes in universities and TVET. Tushman and Romanelli (1985:175) assert that core values and belief define an organization's realm and competitive strategy.

The data revealed that traditional competencies such as cataloguing and classification are becoming less important in LIS education and training curricula. This was evident in the frequency of these courses at lower level qualifications such as NC, ND, undergraduate degrees, and post graduate diplomas, while at masters level they are hardly noticeable. Similarly, Ocholla (2001) observed that courses in cataloguing and classification previously considered as essential in LIS education and training are being slowly phased out of the LIS curriculum.

1) LIS foundational/core competencies

The data suggest that the core or foundational competencies encapsulated in LIS curricula are:

- | | | |
|----------------------------------|----------------------------------------------------------|---------------------------------------------------------------|
| • Information management | • Database design and management | • trouble shooting |
| • Collection development | • Networking | Ability to translate library service into online medium |
| • Management | • Design and analysis of information application systems | • Licensing |
| • Reference sources and services | • Information retrieval | • In-depth working knowledge of ICT and emerging technologies |
| • Cataloguing | • Evaluation | • Information storage |
| • Classification | • Assessment | • User needs and information seeking behaviour |
| • Subject analysis | • Creativity | |
| • Indexing | • Information dissemination | |
| • Information services | | |
-

The core competencies in LIS curricula are inclusive and include traditional LIS technical, ICT and information related competencies. The findings suggest a trend towards multi/inter/transdisciplinary subjects that are considered as core competencies in LIS education and training. The findings confirm Minishi-Majanja's (2009:153) claim that "there continues to grow a diversity of fields that are considered as core competencies, which when pitched against the need for market-ready graduates, make the task of preparing a curriculum difficult".

There is evidence in the data that LIS curricula have kept a minimum number of credits and content requirements in LIS curricula. These include: cataloguing, classification, indexing, subject analysis, collection development and management, information storage, retrieval and dissemination, reference sources and services, user needs and information seeking behavior, information management and information services. This suggests that LIS education and training curricula have not deviated significantly from its traditional roles of information provision. The findings are also consistent with Braude and Wood's (1997) observation that the LIS profession and its academic discipline have not departed from the core functions of information collection, organization, storage, retrieval and dissemination. They state that what has changed is the environment and technologies used to accomplish these roles. This was

apparent in the existence of both LIS traditional core competencies and ICT and information related competencies among LIS foundational/core competencies. The finding suggests a key punctuation in the foundational/core competencies of LIS education and training programmes due to major environmental changes caused by information and technological innovations (Romanelli and Tushman, 1994).

In addition, the findings revealed that the concepts of information science and ICTs have been integrated in traditional courses such as cataloguing, classification, reference services, collection development and management, information storage, retrieval and dissemination, and information management. This suggests that ICTs and information related competencies have gained their place in the structure of LIS core/foundational competencies. However, the data indicate that ICT and information related competencies have gained the principal position in LIS core competences. This has fundamentally left LIS foundational/core knowledge in disarray, until a new base is established. Markey (2004), a decade ago in the United Kingdom context also confirmed that ICT and information related competencies feature prominently in the core curricula of LIS education and training programmes. The findings confirmed Tushman and Anderson (1986:439) assertion that “technology is an important source of environmental variation and hence a critical factor affecting population dynamics”.

2) Technological competencies

Figure 3 also shows a strong trend towards the integration of technological competencies in LIS curricula. The findings are consistent with the findings of Minishi-Majanja (2004)’s study which indicated that LIS education programmes have integrated ICT related courses in their curricula. The evidence was readily apparent in ICT courses such as: introduction to computers, automation, information systems management, web design and administration, database design and management, application of information technology tools, geographic information systems, web 2.0, and information retrieval systems, Open Source Software’s (FOSS); Online Public Access Catalogue (OPAC) and open access resources, interactive information systems applications, networking, trouble shooting, hardware and software, networking and consortia, information literacy, and social media. The findings suggest a major shift from training for the library institution to a wider information environment. The findings are consistent with Tushman and Romanelli’s (1985) statement that movements into or out of major product lines and changes in principal customer targets are important strategic

changes. The technological competencies suggested in the findings are in agreement with IFLA, ALA and CILIP guidelines.

3) Business/managerial competencies

The findings indicate that business/managerial competencies have gained momentum in LIS education curricula. Competencies such as: management, planning, marketing, customer care, financial management, conflict management, negotiation and persuasion, budgetary and fiscal management, strategic management, supervisory skills, performance management and evaluation, quality management, ability to motivate, strategic planning, human resources management, project management, information consultancy and brokerage, and entrepreneurship were apparent in the LIS curricula. The finding suggests a trend towards a business focused perspectives in LIS education and training. This was attributed to socio-economic factors and a drive to address the problem of unemployment in the country. Some of the competencies suggested in the findings fall within the stipulations of IFLA, ALA and CILIP published guidelines.

4) Communication and community service competencies

The data show that communication and community service competencies were encapsulated in LIS education curricula. These competencies were apparent in courses such as: communication, information science, comparative and international librarianship, libraries and society, afro-centric librarianship, information and communication theory, and production and publishing. The objectives of the curricula analyzed, indicated that these courses are taught so that LIS students are able to communicate with users, service providers, and among themselves as well as to analyze the epistemological premise of different information systems. The competencies suggested in the data falls within the requirements of CILIP and IFLA published competency frameworks.

5) “Workplace competencies” and interpersonal skills

The findings also revealed a new and distinct set of ‘workplace competencies’ and interpersonal skills, such as analytical skills, team-working, creativity, networking, problem solving, ability to collaborate, innovativeness, ability to quickly learn, critical thinking, flexibility, change management, time management, evaluation and assessment which were integrated in different courses in the LIS curricula. The findings are in agreement with IFLA and CILIP guidelines which recommend that graduates should be equipped with generic

skills transferable to the working environment (IFLA Education and Training Section, 2009). Further examination of the data suggests these workplace competencies and interpersonal skills listed above are closely associated with highly-involving and interactive work practices.

The workplace competencies and interpersonal skills were not offered as independent courses but are ingrained in different course objectives. Some of these courses are: research, cataloguing, classification, entrepreneurship, practicum, abstracting and indexing, libraries and society, reference services and retrieval systems, children libraries, marketing of information products and service, contemporary issues in LIS, archival and library information system management.

6) Legal framework for practice competencies

Legal framework for practice competencies was evident in courses/subjects such as: legal and ethical issues in LIS, intellectual property rights (IPRs), information policy studies, licensing, and information ethics. The data suggest that LIS education and training curricula have integrated ethical and legal considerations relating to storage, processing, retrieval and use of information systems. The findings validate IFLA and CILIP published competency frameworks that suggest that competencies related to information policy and ethics and/or information governance and compliance should be part of LIS curricula.

7) Practicum/internship

The data suggest that practicum/internship is an integral part of LIS curricula. The findings also agree with the IFLA Education and Training Section (2009) claim that internship should be an integral part of LIS curriculum. IFLA Education and Training Section (2009) assert that practicum provided LIS graduates with an opportunity to appreciate the interplay between professional theories and their application in professional practice. The findings are in accord with the IFLA published competency framework which emphasizes that internship should be an integral part of the LIS curricula.

8) Research

The findings indicated that research competencies are stressed in LIS curricula. The data show that research is a requirement for the attainment of HND, Bachelor of Science Honours Degree in Library and Information Science/ Bachelor of Library and Information Science, Bachelor of Technology Degree in LIS, Post-graduate Diploma in LIS, and Master of Science

Degree in Library and Information Science. The findings also revealed that research competencies are also offered through courses such as research methods and statistical analysis, research methods in information science, and statistics in LIS. The IFLA, ALA, CILIP published competency frameworks consider research as vital competency in LIS education and training.

9) Specialized competencies

The data suggested that specialized competencies such as the ability to provide information, service for specialized and disadvantaged groups, records management, and ability to develop specialized information systems were also encapsulated in the LIS curricula. These competencies were evident through courses such as specialized information systems in agriculture, health and development studies, records management, information studies, indigenous knowledge systems, children's libraries, and information and rural development. The findings suggest a trend towards the development of specialized professional competencies in the curricula.

5.3.3 Skills needed by the information industry

The study also sought to address the specific question –What LIS skills are needed by the information industry? The research question sought to ascertain the skills needed by the information industry. The variable –“revolutionary period” from the Punctuated Equilibrium Theory by Tushman and Romanelli (1985) informs the research question. Romanelli and Tushman (1985:1141) defined revolution periods as –short bursts of fundamental change that substantively disrupt established activity patterns and install the basis for new equilibrium periods”. The variable revolution periods can be described using two elements: internal and environmental changes.

1. –Internal changes: represent the inability of the system to meet its own goals and demands based on its current design.
2. Environmental changes: represent pressures on the system from the environment in which it operates, for example, introduction of a new technology into the system” (Gersick, 1991:22; Tushman and Romanelli, 1985; Tushman and Anderson, 1986).

This specific question is answered through two sub questions in the research instruments. The first question was: LIS graduates are not well suited or prepared for the job market? This question was partially informed by the Vice Chancellor of the University of Nairobi. In his remarks to LIS professionals in 1997 he stated that “... LIS graduates are not well suited or prepared for the job market...” The second question was: what skills are required of LIS professionals in the contemporary workplace?

a) Preparedness of LIS graduates for work environments

LIS employers, faculty and final year students were asked to comment on the statement: LIS graduates are not well suited or prepared for the job market. The majority (78%) of LIS final year students agreed with the statement that ... LIS graduates are not well suited or prepared for the job market. The findings are presented in table 10

Table 10 LIS student’s perspectives on their preparedness for work environments (N=72)

	Frequency	Percent
Sufficiently prepared	16	22
Insufficiently prepared	56	78

Table 10 shows that the majority (78%) of LIS students suggested that they were inadequately prepared for the work environment while 22% indicated that they were adequately prepared. The data suggest that the majority (78%) of LIS final year students consider themselves inadequately prepared for the job market. The responses offered indicated varying levels of meaning, similarities and difference in their experiences. A male student summarized his concerns and opinions stating, “We have the knowledge but lack hands on practice due to inadequate resources”. Another student spoke about the curricula, and noted, “The curriculum used does not speak to the reality on the ground”.

The data suggest that LIS students were inadequately prepared for their roles, and this was attributed to insufficient resources, lack of hands on practice and an outdated curriculum. The

finding validated the findings of the Report of the Presidential Commission of Inquiry into Education and Training in Zimbabwe which reported the inability of the educational system to produce industry ready graduates (Nziramasanga, 1999). The finding revealed a perceived divergence of the skills and competencies produced by LIS education and training and the skills needed in the work environment. The relevance of LIS education and training curriculum was questioned by LIS graduates. The finding confirmed Murphy (n.d) assertion that few LIS education and training programmes scrutinize the relevance of the curriculum they offer. This suggests that LIS education and training programmes were failing to meet their own goal of producing adequately prepared graduates for the industry and profession. The misalignment between supply and demand of competencies provides a major impetus for revolutionary changes in LIS education and training.

Additionally, there is evidence in the data that LIS employers require graduates equipped with applied skills. The findings show that LIS employers emphasized applied skills because of the need to solve immediate problems in their day to day work environments. An earlier study by Chikonzo (2013) also found that LIS practitioners in Zimbabwe regard the existing LIS curricula as too theoretical with limited relevance in contemporary LIS work environments. However, this perspective was strongly opposed by Bawden and Robinson (2012) arguing that it is much more valuable for students to have an in-depth understanding of the profession, theories, principles and concepts rather than functional competencies. They maintain that practical competencies can be learned on the job, through lifelong learning and Continuing Professional Development (CPD). The findings draw attention to the issue of theory versus practice in LIS education.

However, 22% of LIS final year students disagreed with the statement noting that they were ~~–adequately prepared.~~” Ten out of the eleven LIS final year students who disagreed with the statement noted, ~~–The training received laid the professional foundation necessary for practice~~”. Yet another student stated, ~~–The knowledge we acquired was applicable to my place of attachment~~”.

The findings revealed that LIS education and training programmes provide LIS graduates with the professional foundation required for practice. Closer scrutiny of the student’s statements revealed that LIS education and training programmes offer a broad educational

foundation necessary for practice. This professional base is applicable in diverse work situations. However, the development of this foundational base is left to the individual graduates and LIS employers to nurture and develop through lifelong learning, CPD or Continuing Professional Development and Workplace Learning (CPDWL).

The data further indicate that LIS work environments are many and have different requirements and expectations of LIS graduates. This suggests that work environments (public, academic, school, and special libraries as well as resource endowed or resource poor working environments) influence the competencies required. The finding is in agreement with the statement made by Kibandi (2013) who stated that individual library environments dictate skills relevance. This finding highlights the question posed by Raju in 2005 –“whether it will continue to be practical or desirable for a single institution to provide education and training for all types of work settings?” (Raju, 2005:70-71). Diversified needs and expectations signify environmental changes and resource disparities in LIS work environments. The Punctuated Equilibrium Theory postulates that the environment in which organizations operates in put pressure on the system to change (Tushman and Romanelli, 1986; Tushman and Anderson, 1986; Gersick, 1991).

LIS employers and faculty members who answered the same questions shared similar perspectives with LIS final year students. However, LIS employers shared another perspective that of skills and knowledge gaps among LIS graduates. A senior university librarian noted, –“We cannot say they are not well suited but we can say they have knowledge and skills gaps which need to be addressed by LIS education and training programmes”. Another added, –“LIS graduates are not conversant with ICT application tools”. Equally another added, –“I think it is a matter of LIS schools lack of capacity to teach the relevant software’s like KOHA, ABC, New GenLib, and Evergreen for example”.

The data revealed that there are knowledge and skills gaps among LIS graduates which need to be addressed in the curriculum. The skills gaps were attributed to lack of faculty capacity to teach the relevant skills and adequate resources to support teaching and learning in LIS education programmes. The deficiencies in LIS student competencies highlighted were in ICT application tools, library automation systems and applied skills. The deficiencies according to the revolutionary variable are a characterization of misalignments within a system’s deep

structure and perceived environmental demands characteristic of revolutionary periods suggested in the Punctuated Equilibrium Theory.

b) Skills required for the contemporary LIS work environment

LIS employers were asked to answer the question: What skills are required of LIS professionals in the contemporary workplace? The findings revealed that a combination of knowledge and applied skills were perceived to be critical for LIS graduates. The views of LIS employers are indicated by their varying perspectives, needs and preferences. The majority (11 out of 17) of LIS employers emphasized ICTs and their applications. A senior university librarian, noted:

We need graduates with knowledge of ICTs and their applications. Competencies in virtual research environments, open access, programming, software development, social media, ability to use and apply information technology in library operations, ability to compare, evaluate, select technologies and software's, ability to translate print based services to electronic services, web designing and administration, networking and consortia management as well as trouble shooting and system diagnosis.

A significant number (9 out of 17) of LIS employers emphasized subject knowledge or profiling. An experienced librarian reemphasized,

...Subject knowledge or profiling is a requisite competency in academic libraries as we need subject librarians with specialties in different subject areas such as mathematics, geography and English. However, this can only be possible if LIS professional education starts at post graduate level than the undergraduate level currently in existence.

Similarly, 5 out of 17 respondents cited project management as a required competency. This view was highlighted by another librarian who noted,

We are running most of our functions and activities such as library automation, web design and administration, and digitization as projects. We need LIS professionals who are able to manage the projects, design business plans, source funding, manage the funds and human resources, negotiate, advocate and evaluate the projects. These professionals should also be motivators, team players, time conscious and committed to the profession and continuous learning.

Another university librarian indicated serial management and information law as important competencies. She explained that,

... Competencies in serial management are crucial as well as knowledge in information related laws such as copyright laws, Public Order and Security Act (POSA), Access to Information and Protection of Privacy Act (AIPPA), Printed Publication Act, Censorship Act, Intellectual Property Rights (IPR) and more.

A library director in a specialized public library identified another set of competencies. These are training, copy cataloguing, knowledge management, Resource Description and Access (RDA), licensing and quality control, noting,

... We require LIS graduates with competencies in training/teaching, Information Literacy Skills (ILS), knowledge management (to manage institutional repositories), knowledge of Resource Description and Access (RDA), copy cataloguing skills, quality control competencies, licensing and negotiation skills with database vendors and publishers.

The data revealed that the competencies and skills considered as essential in present-day LIS work environment are diverse and transcend LIS disciplinary boundaries. The data indicate that the competencies required are multi/inter/transdisciplinary in nature. This suggests that LIS professionals are required to integrate multi/inter/transdisciplinary knowledge to perform professional tasks in current work environments. The competencies required in LIS work environments include:

- | | | |
|---------------------------------------------------------|--------------------------------------------------------------------|------------------------|
| • Organization of information | • Ability to develop and manage information systems | • Negotiation |
| • Knowledge of bibliographic tools and standards | • Ability to evaluate and select ICT tools and systems | • Collaboration |
| • Ability to evaluate and select information sources | • Ability to translate print based services to electronic services | • Teaching/training |
| • Information storage | • Networking and consortia skills | • Communication |
| • Information retrieval and dissemination | • Database licensing | • Presentation |
| • Information repackaging | • New media application | • Lifelong learning |
| • Subject profiling | • Web designing and management | • Soft skills |
| • Ability to understand information related legislation | • Database design and management | • Publishing |
| • Information literacy | | • Research |
| | | • Problem solving |
| | | • Innovativeness |
| | | • Team work |
| | | • Persuasion |
| | | • Project management |
| | | • Financial management |
| | | • Purchasing and |

skills		supply
• Serial management	• Web surfing	• Marketing
• Open access	• Trouble shooting and diagnostic skills	information services
• Infopreneurship	• Web harvesting	• Social responsibility
• Meta data	• Social media	• Creativity
management	• Ability to develop and manage special information services	• Integrity
• Indexing and thesaurus construction		• Versatility
• Copy cataloguing		• Innovativeness
• Information seeking and user interface		• Commitment
• Management		• Ability to work independently
• Leadership		• Ability to make informed decisions to solve workplace problems
• Human resources financial management		• Ability to exercise sound reasoning
• Knowledge management		• Synthesis
• Budgeting		
• Quality control		

The myriad skills suggested by LIS employers signify a paradigm shift in competencies and skills required of LIS profession. The data attributed this to changing work environments and use of ICTs to accomplish professional tasks. The finding corroborated Sutton's (1999) findings which found that adoption and use of new innovations creates changes in established practices, tasks and knowledge. Danner (1998) also observed that the LIS body of knowledge is evolving and the list of core competencies required in the labour market is transient in nature. The Punctuated Equilibrium Theory put forward that "revolutionary outcomes are unpredictable as they may or may not leave the system in better shape" (Gersick, 1991:20).

The data suggest that ICT has become an enabler of professional tasks in the LIS professional. The findings are in agreement with the findings of Van House and Sutton (1996) who observed that ICT have been fused in the LIS for service provision. The high demand for ICT applied competencies such as programming, software development, social media, ability to use and apply information technology in library operations, ability to compare, evaluate, select technologies and softwares, ability to translate print based services to electronic services, web designing and web administration, networking and consortia

management and trouble shooting and diagnostic competencies indicate use and adoption of ICT innovations in the LIS profession. According to Tushman and Romanelli (1986); Tushman and Anderson (1986); Gersick (1991), introduction of new technologies such as ICT puts pressures on a system to transform.

The findings show a need of subject knowledge or profiling competencies in academic libraries. Slightly more than half of the respondents (9 out of 17) suggested subject knowledge or profiling as a required competency. The suggestion of this competency is a clear testimony of the need for subject librarians with specialties in subjects such as mathematics, history, and economics besides LIS specialization. The results are consistent with the findings of Kavulya (2007) in Kenya. He concluded that “subject knowledge in other fields such as English, sociology, economics, and mathematics enables LIS professionals to relate information to its subject and social contexts” (Kavulya, 2007:219). The implication of this finding is that there is need for a post graduate LIS education model rather than the undergraduate model currently in existence.

The data also revealed diversity in competencies or skills needed in the information industry. This demonstrates that the LIS profession is experiencing a revolutionary period where the professional underlying order has been taken apart and a new order is being formed (Tushman and Romanelli, 1985). The data suggest that it is difficult to come up with an agreed list of core competencies in the LIS profession. This has led Kibandi (2013) to assert that LIS labour markets are dynamic and LIS education and training curricula have failed to keep up with the changes. The Punctuated Equilibrium Theory suggests that organizations need to adapt and transform through continuous changes (Tushman and Romanelli, 1985).

Evidence from the data also suggests evolving roles for information professionals. This is in agreement with the findings of Chikonzo (2013) who reported changes in roles and responsibilities of LIS professionals. The changes were attributed to changes in user expectations, dominance of ICT use in professional tasks and changing modes of information production. Also Chakraborty's (2013) findings in India revealed that LIS professionals in India have adopted new roles as content managers, consultants, facilitators, consortia managers, web designers, database designers and administrators. The inference from this finding is that there is a major environmental shift in the LIS profession caused by ICT innovations, changing users information seeking behavior and ICT use. This has resulted in

the development of new roles for LIS professionals. The findings are in accord with Tushman and Anderson (1986); Lyytinen and Rose (2003) claim that ICTs have revolutionized professional tasks.

Evidence from this study suggests that traditional LIS technical competencies are no longer considered as the most important competencies in LIS work environments, but have been replaced by a combination of work-related applied, ICT and generic skills, as well as personal attributes. The findings substantiate the Punctuated Equilibrium Theory claim that major organizational changes result in previous strategic priorities being succeeded by new ones (Tushman and Romanelli, 1985).

The findings also suggest a trend towards disciplinary convergences in LIS. This indicates that the LIS profession has expanded through the integration of multidisciplinary, interdisciplinary and trans-disciplinary tasks. The proliferation of competencies from other disciplines such as ICT, marketing, information law, teaching, policy, management, human resources and financial management suggest disciplinary convergence. Virkus (2012) also noted that the LIS field has become multidisciplinary, interdisciplinary and transdisciplinary in nature. He further asserts that knowledge and experience from other disciplines are needed to provide quality services in the LIS profession. The findings support Tushman and Romanelli's speculation (1985:174) that in organizations there is a process of convergence which operates, through incremental change mechanisms, to align and make consistent the complex of socio-political and technical economic activities that support a firm's overall strategic orientation".

The findings further revealed that behavioural and personal skills which are not traditionally associated with LIS are sought after in LIS work environments. Personal and behavioural skills and competencies such as: critical thinking, integrity, honesty, versatility, innovativeness, multitasking, commitment to the profession, ability to work independently, team work, affability, ability to build partnerships, communication, presentation, lifelong learning and persuasion were considered as critical by LIS employers. The findings suggest a growing demand for transferable and generic skills that enable LIS practitioners to work effectively and contribute positively to organizations, clients and the profession. Additionally it allows practitioners to function across different cognitive domains and across a variety of

social and employment settings. An earlier study by Shongwe and Ocholla (2011) found similar findings. The study found that conventional LIS skills have become less important for employers. The study claimed that behavioral and personal skills such as ability to learn quickly and adapt to changes in the profession, team work, social skills, creativity, flexibility and, communication have become important in LIS work environments. These skills are viewed by LIS employers as a prerequisite for employment, service provision, and adaptability and change management in the dynamic work environments (Lynch and Smith, 2001; Subramaniam and Jaeger, 2011).

5.3.4. Extent of ICT integration in the LIS curricula

The specific research question was, “What is the extent of ICT integration in the LIS curricula?” The question sought to establish the degree of ICT integration in LIS curricula. The research question is informed by two variables: antecedents and perceived attributes of an innovation from the DOI theory by Rogers (1995); and the revolution period variable from the Punctuated Equilibrium Theory by Tushman and Romanelli (1985). Under the antecedent variable, Rogers (1995) posits that the success of diffusion and adoption of new innovations depends on awareness of the innovation, availability of potential adopters, and social systems norms. Rogers (2003) regards the antecedent’s variable as the facilitative conditions which should be in place for an innovation to successfully diffuse within a social system. The conditions include previous practice, felt needs or problems, innovativeness and norms of a social system (Rogers, 2003). Rogers (1995) described the perceived attributes of an innovation as the intrinsic characteristics of the innovations that influence an individual’s decision to adopt or reject an innovation. The perceived characteristics of an innovation includes: relative advantage, compatibility, complexity, trialability, and observability (Rogers, 1995).

The specific research question was answered through one statement and two questions in the research instruments:

1. LIS education programmes in Zimbabwe have invested considerably in ICT infrastructure.
2. What is the extent of ICT integration in the LIS curricula?
3. Have you integrated ICT in teaching and learning? Elaborate.

a) Investments in ICT infrastructure

Using a five-point scale ranging from “strongly agree, agree, undecided, disagree and strongly disagree”, LIS faculty were asked to indicate their level of agreement with the statement “LIS education programmes in Zimbabwe have invested considerably in ICT infrastructure”. The data suggest that LIS education and training programmes have not invested considerably in ICT infrastructure. The findings are presented in figure 4.

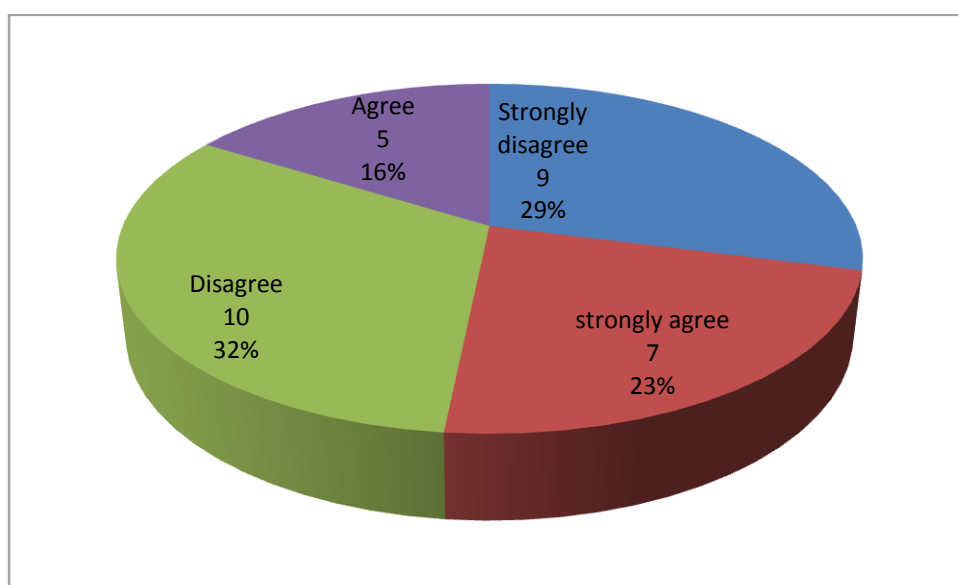


Figure 4 Faculty perception of ICT investments in LIS programmes (N=31) (Source: the researcher)

Figure 4 shows that the majority 61% (29% strongly disagree and 32% disagree) consider LIS education and training programme ICT infrastructure investments to be inconsiderable. While the minority 39% (23% strongly agree and 16% agree) regard ICT infrastructure investments in LIS education programmes as considerable.

The data suggest disparities in ICT infrastructure investments in LIS education and training programmes. This was apparent from the 61% who indicated inconsiderable investments and 39% who suggested considerable ICT infrastructure investments. Previous empirical studies indicate that this is not a new phenomenon. Findings of Ocholla (2005); Ocholla and Bothma (2007) and Minishi-Majanja and Ocholla (2004) also revealed the ICT disparities among LIS education and training programmes in Southern Africa. The studies attributed this to both economic and political factors. Furthermore, the DOI theory by Rogers (1995) posits that

organizational factors such as funding and policies affect adoption and use of innovations. The findings suggest low levels of ICT investments and consequently low integration of ICTs in LIS curriculum.

The Deans/HODs were asked a relatively similar question; “Have LIS education and training programmes invested considerably in ICT infrastructure to facilitate ICT integration in the curricula?” All 5 agreed that ICT investments in LIS education and training institutions were insignificant to support ICT integration in the curriculum. A senior HOD stated that:

... as an institution we have invested a little in ICT resources and the investments were further boosted with the help of College IT Enhancement Program (CITEP) and the President’s office donations ... literary we have the basic infrastructure like computer laboratories and internet connectivity. However, the computer laboratories are inadequate and access is a problem, the computers housed in these labs are refurbished, however, they are incompatible to new systems and software’s, and there is poor internet access and connectivity challenges, inadequate supply of electricity and we lack complementary equipment such as overhead projectors, cameras, laptops, TVs, microphones as well as video conferencing technologies.

The data revealed a tendency on relying on donor initiated ICT investments in LIS education and training. This was corroborated by Opati’s (2013) findings which concluded that ICT initiatives in African universities have been donor funded, notably by the the Ford Foundation, Rockefeller Foundation, Bill and Melinda Gates Foundation, NORAD, and JICA. Donor initiated ICT investments suggest low levels of ICT investments in LIS schools. This also point to lack of government commitment to ICT development and investment in the country. This substantiates Rosenberg (2007) claim that the state and level of a country’s ICT infrastructural development is also an important determinant of adoption and use of ICT.

Evidence from the data suggests insufficient ICT infrastructure investments to support ICT integration in LIS curricula. Findings from a series of empirical studies have also observed that LIS schools have inadequate technological infrastructure to support ICT integration in LIS education curricula (Okello-Obura and Kigongo-Bukenya, 2011; Manda, 2006; and Minishi-Majanja, 2004). The findings validated Richard’s (2005) claim that ICT integration in LIS curricula without the necessary supportive ICT infrastructure amount to what is called add-on activities; insignificant to revolutionize the LIS educational system. This was

confirmed by Rosenberg (2007) asserting that initial conceptualization of an innovation needs the appropriate supportive infrastructure, technical capabilities and skills to make it viable.

b) Extent of ICT integration in the LIS curricula

The question, –What is the extent of ICT integration in the LIS curriculum?” was used to interrogate LIS education and training curricular documents. The data suggest that LIS departments have adopted ICT innovations. This was apparent by the existence of ICT components at all levels of the curricula: paraprofessional, undergraduate and post graduate. Closer analysis of the data shows that the following ICT courses have been integrated in the LIS curricula:

- | | | |
|-----------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------|
| • Introduction to information technology | • Information retrieval systems | • Automation of library processes |
| • Online information retrieval | • Information technology tools and applications | • Management of electronic records |
| • CDS/ISIS | • Computerized Documentation System | • Integrated Set of information System |
| • Reference services and retrieval systems | • Database Application in libraries, archives and publishing | • Digital libraries |
| • Archival and Information systems management | • Advanced information technology applications | • Web design and content management |
| • Designing and realization of internet information | • Introduction to computers | • Metadata management in LIS |
| • Web applications and design | • Records systems analysis and design | • Application of information technology tools in information centers |
| • Management of electronic resources | | • Database management systems |
| • Data communication and networks in libraries | | • Database analysis and design |

It is evident that LIS education and training programmes have integrated a diverse array of ICT courses in the curricula. Basic computer literacy and applied ICT courses such as: introduction to information technology, introduction to computers, database management systems, data communication and networks in libraries, management of electronic resources, automation of library processes, information technology tools and applications and online information retrieval systems. These courses were prevalent at paraprofessional, undergraduate and postgraduate diploma levels. However at the masters level, only one ICT

course (Advanced Information Technology Applications) was apparent. Empirical evidence from studies by Minishi-Majanja (2004); Kamba (2011); Buarki, Hepworth and Murray (2009); Hanson-Baldauf and Hassell (2009); Tinio (2003); Miwa (2006) and Al-Daihani (2011) corroborated the finding, confirming that integration of ICT courses in the LIS curricula is a global trend. According to Rogers (2003:177), adoption is a decision of “full use of an innovation as the best course of action available”. However, the nature and diversity of ICT courses integrated in the LIS curricula suggest reactive rather than proactive changes. The data show that the ICT courses were launched without the supportive ICT infrastructure, adequate ICT facilities, faculty ICT competencies and sustained funding and leadership commitment. The finding is in agreement with the Punctuated Equilibrium Theory claim that during reactive changes, transformation efforts might be constrained due to shortages of resources (Nadler and Tushman, 1995).

Furthermore, the curricular documents analyzed clearly show that ICT components have been integrated in traditional LIS subjects such as cataloguing and classification, reference and information services/sources, collection development and management for example. However, a closer examination of the data signified that the execution of lessons is subject to individual lecturer’s discretion. This applies to areas such as ICT knowledge and competencies, subject pedagogy, availability of ICT resources and time management. Evidence from empirical studies also confirmed the present findings, noting that the ways in which ICT is approached is left to the autonomy of individual subject tutors and is based on their ICT competencies (Haydn, 2009). The inference of the finding suggests a trend towards “add-on” ethos in LIS curricula. Add-on culture results in imbalance in the combination of theory and applied ICT courses in the curricula (Minishi-Majanja, 2004; Edegbo, 2011). The DOI theory by Rogers (1995:224) corroborates further, noting that an innovation needs to “be compatible not only with deeply embedded cultural values but also with previously adopted ideas. Old ideas are the main mental tools that individuals utilize to assess new ideas. One cannot deal with an innovation except on the basis of prior knowledge. Previous practice provides a familiar standard against which an innovation can be interpreted, thus decreasing uncertainty”.

The findings further suggest that although LIS education and training curricula have integrated ICT within the formal curriculum both as independent modules and as embedded

topics, the available ICT infrastructure (see section 5.3.4); teaching and learning practice, course contents and assessment methods, still supports traditional learning practices. The findings confirm Weston and Bain's (2010) assertion that ICT modules in LIS education and training are being implemented within the existing paradigm and this will not bring about major changes. The ICT courses integrated in the LIS curricula need associated changes in educational technology, as well as faculty capacity, and assessment, teaching and learning practices. The findings are in agreement with the DOI Theory claim that "presumed compatibility with prior experiences, knowledge and competencies led adopters to incorrectly utilize the innovations, resulting in over-adoption and miss-adoption" (Rogers, 1995:215).

b) ICT integration in teaching and learning

LIS education and training faculty were asked to answer the question, "Have you integrated ICT in teaching and learning? Elaborate". 61% of LIS education and training faculty indicated that they have not integrated ICT in teaching and learning. This constitutes the majority. Alternatively, the minority (39%) indicated they have integrated ICT in teaching and learning. The findings are presented in figure 5.

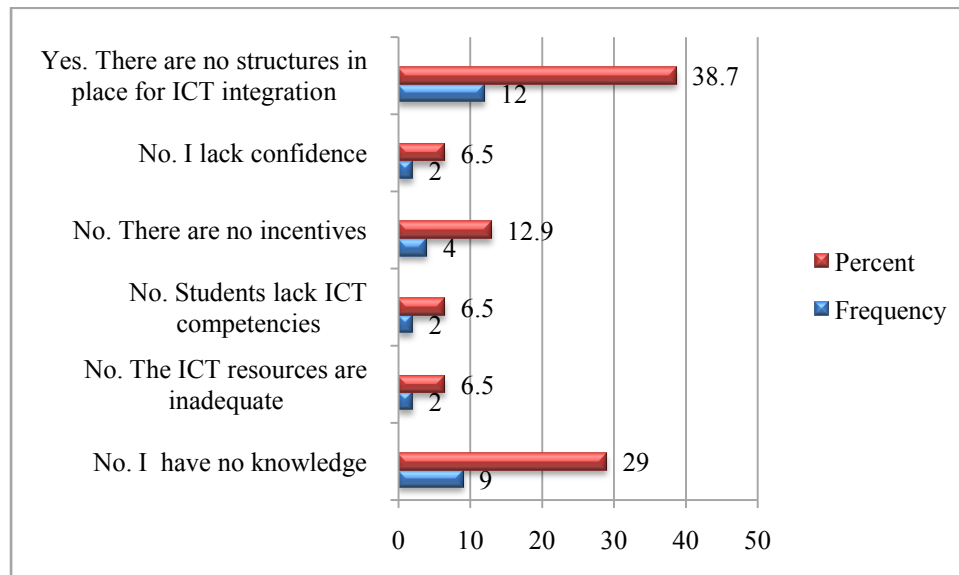


Figure 5 ICT integration in teaching and learning (N=31) (Source: the researcher)

Figure 5 shows that the majority (61.3%) has not integrated ICT in teaching and learning and this was attributed to lack of confidence, lack of incentives, lack of students ICT competencies, inadequate ICT resources, and lack of ICT knowledge among faculty.

The responses of LIS faculty draw attention to key challenges on ICT integration in teaching and learning. The 29% who indicated that: “No. I have no knowledge”, suggested lack of ICT competencies among LIS faculty to facilitate ICT use in teaching and learning. The findings suggest a disjuncture in ICT use in teaching and learning and faculty ICT knowledge. Further analysis of the data show that the ICT skills development problem is compounded by the fact that 87% (27) of LIS faculty in Zimbabwe falls within the 31-40 (35%); 41-50 (42%) and 51-60+ (10%) age range and only 13% falls within the 21- 30 age range, implying that digital natives among LIS faculty are very few and there are many LIS faculty trained before computer laboratories became permanent establishments in LIS schools. The data suggest that the majority (87%) of LIS faculty have limited exposure in ICT use in teaching and learning and as a result lack the relevant knowledge. This implies that ICT is not used as a medium of teaching and learning in LIS education and training due to lack of ICT competencies among faculty. Barron and Goldman (1994) suggested ICT incapacity among teachers result in teachers replicating what they were taught. Buarki, Hepworth and Murray (2011) indicated that ICT adoption in teaching and learning is constrained by lack of ICT expertise. Rogers (1995) emphasized that an innovation should be compatible not only with deeply embedded cultural values but also with previously adopted ideas and competencies.

About 12.9% of faculty noted that “No. There are no incentives”, this draws attention to the aspect of lack of incentives for ICT integration in teaching and learning. This implies that the financial rewards in LIS education and training are not commensurate with the tasks. LIS faculty tends to regard ICT use in teaching and learning as an extra load. This might have been a contributing factor to the low levels of ICT integration in LIS education and training. Similar findings have been established in a study by Anderson, Varnhagen and Campbell (1998). The study indicated that use of ICT for instructional purposes is positively correlated with incentives. Therefore incentives should be one of the key adoption strategies in LIS education and training. The DOI theory by Rogers (1995) confirmed this, claiming that incentives in the form of cash or in kind increase the relative advantages of the innovation and consequently speeds up its rate of adoption.

The research data show that there is a ubiquitous time problem in LIS education and training programmes which does not allow effective ICT integration. The data attribute this to LIS faculty heavy workloads and lack of time and opportunities for faculty enskilling through

staff development programmes. These factors contribute to the low levels of ICT integration in LIS education and training. Al-Awani (2005) confirmed that lack of time is a major barrier to ICT integration in teaching and learning in Saudi Arabia. Empirica (2006) suggested faculties busy schedules as a major obstacle in ICT integration in teaching and learning. The DOI theory by Rogers (1995) also emphasizes time as a major variable in the diffusion process.

About 6.5% who suggested that, “No. I lack confidence”, suggested lack of confidence among LIS faculty to use ICT correctly and effectively in teaching and learning. This suggests that correct use of ICT in teaching and learning is a major factor in ICT integration in teaching and learning. This might be a contributing factor to the low levels of ICT use in teaching and learning in LIS education and training. O’Haire (2003) claims that although teachers have adopted ICT in education, they are not sure if they are applying ICTs correctly and effectively. The teachers attributed the anxiety to fear of losing authority in the classroom and losing control of the learning process as it become more learner-centered (Hennessy, Ruthven and Brindley, 2005). The DOI posits that uncertainty is an obstacle to the adoption of innovations (Rogers, 1995). The result suggests that the consequences of an innovation may create uncertainty among potential adopters (Rogers, 1995). “Consequences are the changes that occur in an individual or a social system as a result of the adoption or rejection of an innovation” (Rogers, 2003:436). The Punctuated Equilibrium Theory claims that emotional responses to change are difficult to manage (Nadler and Tushman, 1995).

The response, “The ICT resources are inadequate”, focuses on the issue of access to ICT facilities. The data suggest that ICT resource inadequacy is correlated to lack of access. Therefore, resource inadequacy is an inhibiting factor in ICT integration in LIS education and training. The finding was corroborated by Becta (2004) who found that lack of access to ICT facilities is a major barrier to ICT use in teaching. However Becta (2004) concluded that inaccessibility of ICT resources is not always caused by non-availability of the ICT resources but due to poor organization and management of the available resources. The data attribute lack of access to ICT facilities to poor scheduling, overcrowding, poor maintenance, and lack of technical staff, downturns, unreliable electricity, poor quality hardware, inappropriate software and poor internet efficiency. Another inhibiting factor in ICT integration was presented by Chisholm, Dhunpath and Peterson (2004) in their claim that teachers need access to ICT resources to try out ICT use in teaching and learning before they can fully

implement it in their daily activities. They further state that schools that use ICTs for administrative purposes, communication, and students' course work or results management are likely to adopt ICTs as pedagogical tools. Rogers (1995) in the DOI theory also suggested that new ideas that can be tried on a limited basis are easily adopted.

About 6.5% of faculty stated that ~~No~~. Students lack ICT competencies", brought to the fore the issue of students' lack of ICT competencies for effective learning. The opinions given indicate that that students' digital literacy is a fundamental factor in ICT integration in teaching and learning. Egan and Katz (2007); Minishi-Majanja (2009; 2004); Katz (2007) reiterated this, claiming that despite increased use of ICT in education and society for communication, business, and entertainment purposes, students still lack ICT literacy skills for effective learning. The data suggest that LIS faculty felt that ICT use in teaching slows down their progress and ability to cover the curriculum within the specified time frame. This suggests that students' lack of ICT literacy skills are a contributory factor in low use of ICTs in LIS education and training. This factor is also supported by Rogers (1995: 234) who hypothesized that ~~the~~ compatibility of an innovation, as perceived by members of a social system, is positively related to its rate of adoption".

Concerning the issue of policy, 38.7% of faculty noted that ~~Yes~~. There are no structures in place for ICT integration", and the data suggest lack of regulatory frameworks on ICT use in education. It also indicates lack of ICT integration frameworks in LIS education and training to inform practice. In addition, the curricula do not specify the depth, coverage and number of credits hours required for some of the ICT modules or topics. The research data show that there are no set standards on ICT use in LIS education. Opati (2013) states that without policies and regulatory frameworks for ICT use in education at a national level, ICT integration in curricula cannot flourish. He emphasized that the policies and regulatory frameworks should be comprehensive enough to harmonize the isolated pockets of ICT integration initiatives in the country's educational system. Rogers (2003) posits that the social structure of the social system influences the diffusion of an innovation. Rogers (2003:23) defined structure as ~~the~~ patterned arrangements of the units in a system". He further claimed that ~~the~~ nature of the social system affects individuals' innovativeness".

5.3.5 Resources for delivering LIS curriculum

The specific research question was, “What human and physical resources are available for delivering LIS curriculum?” The research question sought to ascertain the available human and physical resources for delivering LIS education and training. The question is informed by the “revolutionary periods” variable from the Punctuated Equilibrium Theory by Tushman and Romanelli (1985) discussed above. This research question is answered using one sub-question in the research instruments:

1. What human and physical resources are available for delivering LIS curriculum?
Elaborate.

LIS education and training faculty were asked to establish the resources integral for delivering LIS curricula. The research data points to human expertise, infrastructure, equipment, funding, up to date curricula, policies and regulatory frameworks, quality cohort of students and information resources as essential for delivering LIS curricula. The findings are presented in figure 6.

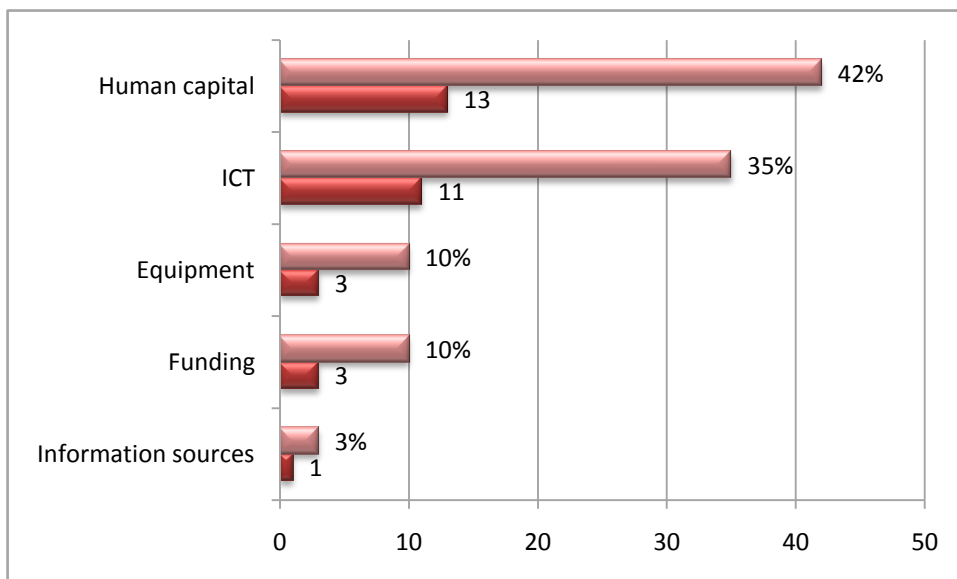


Figure 6 Resources for delivering LIS curricula (N=31) (Source: the researcher)

Results in figure 6 show that 42% (13) of respondents specified human capital; 35% (11) noted infrastructure; 10% (3) itemized equipment; 10% (3) listed funding; and 3% (1) identified both print and digital information resources as integral for delivering LIS curricula. A senior lecturer commented on the question of human expertise integral for delivering LIS

curricula. He stated that, "... skills, the right skills are integral for delivering LIS education curricula". One lecturer remarked on the scarcity of highly qualified LIS faculty noting that,

...there is need for highly qualified LIS faculty competent in ICT, research and inter-disciplinary knowledge ... but we are experiencing shortages of highly qualified LIS staff due to brain drain.

Another HOD added to the discourse the issue of skills mobilization and management noting that,

...adequate skills and competencies are crucial for delivering LIS curricula. But, equally important are how these skills are mobilized and managed for better use in the work environment.

The research data suggest that skilled manpower is integral for delivering LIS curricula. In addition the data show that there is a ubiquitous problem of lack of highly qualified LIS faculty. This was attributed to brain drain. The respondent's remarks suggest that the available human expertise is not being successfully harnessed. The finding is in agreement with Bhasin's (2012) assertion that the most important resource for any industry is its human resource. He further emphasized that the vital attributes of human capital are their competencies, skills, behaviours, knowledge and experiences. Therefore the effectiveness and utility of LIS programmes largely depends on the expertise of the teaching staff and their availability (Bhasin, 2012). The Punctuated Equilibrium Theory suggests that scarcity of resources increases organizational uncertainty and incapacity to achieve its own goals (Tushman and Romanelli, 1985). The data suggest that faculty competencies need to be continuously renewed in order for them to be effective and relevant in delivering LIS education and training curriculum.

Nearly 35% of the respondents identified ICT infrastructure as a key component in delivering LIS curriculum. However, these respondents presented diverse views on what constitute infrastructure. One lecturer identified telecommunication as an essential infrastructure. She stated that:

...telecommunication systems are essential for delivering LIS curriculum however, these are not widely spread as there are areas in Zimbabwe where access to telecommunication is impossible and the postal system is very poor. This makes the delivery of distance education very difficult.

Internet connectivity was noted as a vital ICT infrastructure needed for delivering LIS curriculum. A junior lecturer raised the need of sustainable internet connectivity stating,

... Internet connectivity is crucial in the contemporary digital environment for the delivery of LIS curriculum however, connectivity is very poor here due to limited bandwidth and at times we experience down turns and electricity outages.

Another academic further identified well stocked computer laboratories as a necessary fundamental ICT infrastructure needed for the delivery of LIS curriculum and remarked that,

...well stocked and up to date computer laboratories are critical for the delivery of LIS curricula. However, our computer laboratories are few and not well stocked. For example in our Bulawayo region the computer student ratio is 1:90 that is we have 900 students registered for different programmes with our university and the regional computer laboratory houses only ten computers.

The data show that a vibrant telecommunication system, efficient internet connectivity, reliable supply of electricity, and adequate computer laboratories are integral for the delivery of LIS curricula. However, the responses draw attention to the inadequateness of the national ICT infrastructure to support ICT use in education and training. A closer analysis of the findings revealed that building reliable and efficient ICT infrastructure is not prioritized at both national and institutional levels. Adams (2003) claims that the problem of underdeveloped ICT infrastructure is a major problem in most African countries. He attributed the problem to underfunding, lack of commitment and political will, and lack of perceived need to develop ICT infrastructure.

About 10% of LIS faculty noted equipment as an important resource for delivering LIS curricula. A senior lecturer stated,

...We need equipment such as overhead projectors, printers, microphone, television, videos, power point projectors, laptops and other peripherals to help us effectively deliver LIS curricula.

Another lecturer indicated the need for relevant software, suggesting that,

...relevant software ... we are struggling to purchase or buy licenses and we end up relying on Free and Open Sources Softwares (FOSS) like

CDSIS which no longer speaks to the current situation. We want relevant and applicable softwares in teaching.

Equipment such as overhead projectors, printers, microphones, television, videos, power point projectors, laptops and relevant softwares were identified as essential in delivering LIS curricula. The finding suggests inadequate teaching equipment in LIS education and training programmes. There is also evidence to suggest an over reliance on FOSS for teaching LIS curricula. Rosenberg (2000) also found that there is a general lack of teaching and learning equipment in HEIs in Africa.

Ten percent (10%) of LIS faculty suggested funding as an essential resource for delivering LIS curricula. The different faculty perspectives on funding were summarized by a lecturer, who stated,

... Funding is of paramount importance for delivering LIS curriculum. We need funds to procure essential equipment and rehabilitate dilapidated infrastructure and complete ongoing building projects, reengineer the curriculum, retrain or retool our faculty, and fund research. Without funds it becomes a challenge to balance educational strategies with economic realities...

The respondent's answers to the issue of funding suggest that financial resources are vital in LIS education and training. The data suggest an unsustainable financial base to support LIS education and training programmes. This suggests the need for sustainable funding in LIS education. Minishi-Majanja (2004) also found similar results. She reported that the rapid pace and transient nature of the changes in the wide society, and the LIS field require sustained funding.

A small number (3%) of the participants indicated that information resources are important. A lecturer stated that,

... We have libraries ...due to budgets cuts we can no longer afford to stock current materials and subscribe to certain journals, although our library is a member of the Zimbabwe University Libraries Consortium (ZULC) which subscribes to several databases such as EBSCO host, Emerald, JSTOR... We also have access to e-journals through Programme for the Enhancement of Research Information (PERI).

However, the major challenge is full access to these e-resources. In most cases we have access to abstracts only and full access is available on condition that individuals pay.

Another lecturer commented on the scarcity and currency of cataloguing and classification standards, noting,

Cataloguing and classification standards used for teaching and learning are inadequate and out-dated and at times during examinations students are either timed to use AACR2 or DDC or are quarantined and write the examination in batches. We would like adequate and current tools to effectively carry out our duties.

It is evident that lack of adequate and current literature and tools is a major concern in LIS education. This was attributed to budgetary constraints. There is also evidence in the data to suggest an overdependence on western literature for teaching and learning. In addition the data revealed the problem of limited access to information resources. This is a major challenge especially for post-graduate studies. The inadequacies were attributed to lack of full access to electronic journals and out-dated information resources due to funding constraints. The finding confirmed Rosenberg's (2000) assertion that availability of the resources does not necessarily guarantee accessibility.

The research data also suggested an acute shortage of up to date standards (tools) such as AACR2, DDC, LC and Sears's list of subject headings. A close analysis of the findings revealed that AACR2 has been superseded by Resource Description and Access (RDA) standards in 2008 but all LIS education and training programmes were still using AACR2 for instructions. In addition, the data revealed that most LIS programmes are still using the 20th or 21st editions of DDC while DDC is now in its 23rd edition. This suggests that the available resources were inadequate and dated. The finding confirms Tushman and Romanelli's (1985) claims that organizations in revolutionary periods should have a free flow of new ideas and information from its environments.

The remarks of Deans/HODS who answered a similar question agreed with LIS lecturers. More than half of those surveyed commented on the issue of learning facilities and furniture. One HOD commented,

... Learning facilities such as classrooms, office space, furniture, and study areas are critical for the delivery of LIS curricula. We solely

depend on rented premises and in most cases different groups of students share a single class. At time students learn in the open due to shortages of classes. This is an unfortunate situation but we have no other options.

Another HOD noted that, “lecture rooms and classes need retrofitting as they have been vandalized or were not designed to accommodate instruction technological tools”. Yet another raised the issue of a favorable teaching and learning environment and noted, “... a clean and well maintained safe environment without political interferences is of paramount importance.”

Learning facilities such as classrooms, furniture, office space, study areas, well maintained facilities and an environment free of political interferences were identified as crucial for delivering LIS education curricula. The data suggest that the learning facilities were inadequate, in need of retrofitting and renovations to make them conducive for teaching and learning. In addition the data revealed that some LIS programmes are solely dependent on rented premises. This has created acute shortages of classrooms. The research data revealed unfavourable learning conditions in some LIS programmes. In addition the data suggest indications of political interference and polarization in institutions offering LIS education and training. The data underlined inadequate learning facilities, political interferences and polarization as impediments to quality education. McKimm (2007) declared that teaching rooms, office space, social and study space should be adequate. In addition he stated that the learning environment should be conducive and free from political interferences.

Two Deans/HODs suggested time as a resource in teaching LIS curricula, but there was a mixed overall response from the Deans/HODs. One HOD noted,

...The problem is we have no time, in fact we are running out of time. The changes in the profession are too many and endless. We need time to acquire new knowledge and competencies, time to conceptualize the changes, experiment with the changes before committing them in the curriculum. All these changes need to be done within the limited time frame of the curriculum.

The data show time as a critical resource in LIS education and training. However, the finding suggests that there is a shortage of time to plan, learn, and experiment with the innovations in LIS education. This was attributed to the transitory and continuous nature of the changes and

the time limits of the curriculum. A close examination of the findings shows that LIS courses in universities are too compressed due to the semesterisation system. This suggests that faculty have no time to go beyond the confines of the curriculum. Studies by Igwe (2005) and Minishi-Majanja (2004) observed that there is need for re-training of faculty. This is necessary if they are to meet the demands of the society and the labour market. Rogers (1995) claimed that adopters need time to learn and experiment with the innovations before making a decision to adopt or reject.

Good leadership was viewed as a requirement for the delivery of LIS curricula. A dean noted that, "... we need visionary leaders who are receptive to change and committed and most of all who have the capacity to run educational institutions".

The research findings revealed that the delivery of LIS curricula require visionary leadership, innovative leadership and leaders who are competent enough to manage educational institutions. A close inspection of the data revealed that some of the Deans/HODs as well as the senior administrators of the institutions were political appointees without the requisite competencies and experience to manage HEIs. This has led to mismanagement and poor leadership in HEIs. The Punctuated Equilibrium Theory posits that during revolutionary periods, members of a social system require visionary leadership and guidance to inspire, direct, motivate members and direct the change process.

An HOD viewed industrial attachment placing as an important resource in LIS curriculum delivery. The HOD remarked,

...Industrial placements are integral for delivering LIS curricula however, the internship positions are becoming scarce as organizations close due to the political and socio-economic challenges in the country.

The area of students' industrial placement was viewed as a critical resource in delivering LIS curricula, but research data revealed that students' industrial placements were becoming scarce. The data attributed this to industrial closures. The closures are due to the socio-economic and political challenges in the country. The Punctuate Equilibrium Theory claims

that organizations are not internally self sustaining: they require resources from its environments to survive (Tushman and Romanelli, 1985).

An up to date and relevant curriculum was cited as an important resource for delivering LIS curricula. A dean noted that –A relevant and up to date curriculum is indispensable”. The data indicate that a vibrant and relevant curriculum is an important resource for delivering LIS education. The dean’s response implies that LIS curricula are not up to date. Close analysis of the data show that LIS education and training programmes have not made a huge effort to reform their curricula in response to the changes in the wider society, the profession and HEIs. The data show that the TVET curriculum was last reviewed in 2004 and university curricula (NUST and ZOU) have not been reviewed since their inception in 2000 and 2009 respectively. Virkus (2012) points out that LIS education and training programmes need vibrant and up to date curricula. He suggested that a curriculum is the best barometer to reflect changes in the profession and the society at large.

Another HOD identified quality students as a critical resource in delivering LIS education. The HOD remarked, –The survival of LIS education and training programmes largely depends on the quality of students attracted to the programmes”. The data revealed that quality student cohorts are essential for the delivering of LIS curricula. The finding substantiates Alabi’s (2004) assertion that students and faculty are important assets in HE. He further declared that without quality students and faculty the educational process is bound to fail.

Policy and regulatory frameworks were seen as integral for delivering LIS curricula. This is evident in the statement made by an HOD: –There is need for clearly outlined policy frameworks to guide ICT infrastructural development, curricula content, and faculty competencies as well as teaching methods”. The finding suggests policy frameworks at both national and institutional levels as vital resource in LIS education and training. The HODs response indicated lack of clear policy guidelines in LIS education and training. The data suggest that lack of policy frameworks to guide ICT infrastructural development, curriculum content, human capacity development and teaching and learning is a major drawback in LIS

education and training. This suggests untapped potentials in LIS education and training due to lack of supportive policy frameworks. The findings are consistent with the International Labor Organization (ILO) (2011:2) assertion that “a national policy provides a basis for a holistic response to education”.

5.3.6 Awareness about paradigm shifts in the information industry

The specific research question was, “what is the level of awareness by LIS faculty regarding paradigm shifts in the information industry?” The question sought to measure awareness among LIS faculty about paradigm shifts in the information industry. The question is informed by the awareness-knowledge variable from the DOI theory (Rogers, 1995). Awareness-knowledge variable is described as awareness-knowledge of the existence of the innovation (Sahin, 2006). The DOI theory posits that the innovation should be known by potential adopters before it can be diffused in a social system.

The specific research question is addressed through a statement in the research instruments.

1. There have been paradigm shifts in the information industry from: specific domains to information pathways; repository to open access; user to a client paradigm; from analogue to digital paradigm; from “just in case” to “just in time” and from Library Science to Information science.

To measure awareness-knowledge regarding paradigm shifts in the information industry among LIS faculty a five-point scale ranging from “strongly agree, agree, undecided, disagree and strongly disagree”, was developed. LIS faculty were asked to indicate their level of agreement with the statement: “there have been paradigm shifts in the information industry from: specific domains to information pathways; repository to open access; user to a client paradigm; from analogue to digital paradigm; from “just in case” to “just in time” and from library science to information science”.

Nearly all (93.6%) LIS faculty surveyed agreed that there have been paradigm shifts in the information industry. The results are presented in figure 7.

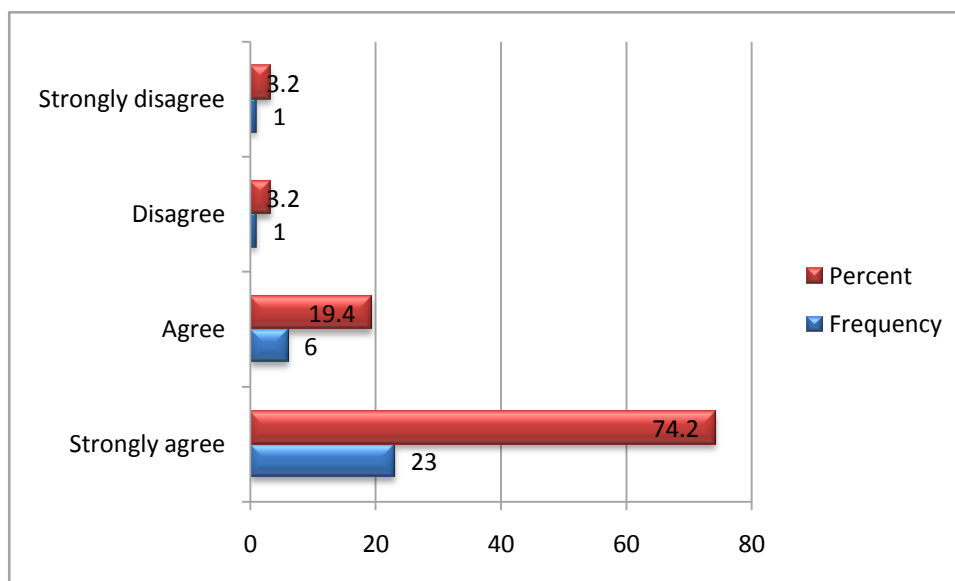


Figure 7 Faculty response to question of paradigm shifts in the information industry (N=31)
(Source: the researcher)

Figure 7 shows that 74.2% strongly agreed; 19.4% agreed that paradigm shifts have occurred in the information industry. While 3.2% disagreed and 3.2% strongly disagreed that paradigm shifts have occurred in the information industry, the majority 93.6% agreed (74.2% strongly agree and 19.4% agree) that paradigm shifts have occurred in the information industry. This suggests high levels of awareness-knowledge regarding paradigm shifts among faculty. The minority 6.4% (3.2% strongly disagree and 3.2% disagree) indicated lower levels of awareness-knowledge regarding paradigm shifts in the information industry.

This high level of awareness of paradigm shifts might be attributed to the communication channels used in LIS education and training. DOI Theory claimed that the “type of communication channels used to disperse knowledge of an innovation influence the level of awareness-knowledge regarding the innovation and its rate of adoption” (Rogers, 1995:207). A 93.6% level of awareness among faculty suggests that the LIS field is highly interconnected and the communication channels are efficient. Rogers (1995:208) put forward that “... the nature of the social system, such as the norms of the system and the degree to which the communication network structure is highly interconnected, also affects an innovation’s rate of adoption”. In addition, the 93.6% level of awareness signifies the effectiveness of change agents’ promotion efforts in the LIS field. The DOI Theory claims that an innovation’s rate of adoption is also affected by the extent of change agents’

promotion efforts (Rogers, 1995:208). The data suggest that the high levels of awareness regarding paradigm shifts in the information industry can be attributed to the effectiveness of change agents' promotion efforts, the interconnectedness of the communication structure and effectiveness of the channels of communication in the LIS field.

A closer analysis of the 6.4% who indicated low awareness levels revealed no association between their level of education, age, institution, and experience. Therefore, this might be attributed to a case of individuals who have no desire to change or who have been exposed to negative information about the innovations. Rogers (2003:189 and Sahin (2006:17) claimed that "individuals exposed to conflicting messages about the innovation tend to turn away from the innovation". In addition Rogers (1995) suggests that lack of knowledge about the innovation and the innovations' complexity and incompatibility traits negatively affects its rate of adoption.

5.3.7 Attitudes towards paradigm shifts in the information industry

The specific research question was "what are the attitudes of LIS academics towards the changes in the information industry?" This question sought to find out the attitudes of LIS faculty towards paradigm shifts in the information industry. The question is informed by the antecedents' variable and perceived attributes of innovation (Rogers, 1995). Antecedents' variable consists of factors preceding the process of disseminating the innovation: personality characteristics (for example general attitude toward change) of the targeted adopters, their socio-organizational contexts, perceived need for the innovation and the flow of information about the innovation (Rogers, 1995). Rogers (1995) describes perceived attributes of innovation as intrinsic characteristics of innovations that influence an individual's decision to adopt or reject an innovation. This entails: relative advantage, compatibility, complexity, trialability, and observability.

The specific research question was addressed by a statement in the research instruments.

1. Adoption and use of ICT in LIS education and training has an advantage over previous innovations

LIS education faculty were asked to respond to the statement. The statement sought to determine the attitudes of LIS faculty towards paradigm shifts in LIS education and training.

The majority (54.8%) had favorable attitudes while the minority (45.2%) had unfavorable attitudes towards the paradigm shifts in LIS education and training. The results are summarized in table 11.

Table 11 Attitudes of LIS faculty to paradigm shifts (N=31)

Responses	Favourable and unfavourable responses	Frequency	Percentage
New ICT and information related subjects have demeaned traditional LIS core subjects to the periphery	Unfavourable	10	32.3
ICT and information related concepts have broadened LIS education spheres of teaching and research	Favourable	9	29.0
The integration of ICT and information related components in the LIS curricula has enhanced students enrollment	Favourable	8	25.8
ICT has rendered most of LIS education faculty's knowledge and skills obsolete	Unfavourable	4	12.9

Table 11 shows that 32.3% (10) felt ICT and information related subjects have lowered traditional LIS core subjects to the periphery while 29% (9) indicated that ICT and information related concepts have broadened LIS education spheres of teaching and research. Alternatively 25.8% felt that integration of ICT and information related components in the LIS curricula have enhanced and leveraged student enrollment. Meanwhile, 12.9% noted that ICT has rendered most of LIS education faculty's knowledge and skills obsolete.

The 32.3% (10) who indicated that ICT and information related subjects have demeaned traditional LIS core subjects to the periphery have negative attitudes about paradigm shifts. A senior male lecturer noted,

ICT and information related subjects have recently gained importance in the LIS curricula and traditional LIS subjects like collection development and management, reference services, cataloguing and classification has been relegated to lower level qualifications in the curricula like NC and ND.

The remarks of the respondent were filled with feeling of loss and the desire to protect. The data suggest strong paradigm effects. The data show that traditional LIS subjects have lost paradigmatic dominance due to ICTs. 32.3% of LIS faculty is experiencing strong difficulties

in accepting ideas outside the existing paradigm. This suggests that the 32.3% are suffering from paradigm paralysis (strong beliefs that the existing paradigm is better). The paradigm effect is preventing the 32.3% from understanding and appreciating the changes in the LIS curricula. The data suggest negative attitudes among LIS faculty. Barker (1988) claimed that individuals who have invested much in the existing paradigm are resistant to change and are often very defensive of the paradigm. Kilbourne and Polonsky (2005) findings also indicated that one's belief in a paradigm has negative effects on both attitudes and perception of change. Research indicates that this is a common phenomenon in LIS education and training globally: Van House and Sutton (1996); Crowley and Brace (1999); Gorman (2004); Bonnici, Subramaniam, Burnett (2009) also saw the innovations as a threat to the profession. Rogers and Jain (1968) claim that potential adopters' personality, traits, and characteristics of their social and communication system influence their innovativeness and attitude toward change. Based on the research data outcomes, it is evident that there are a significant number of unfavorable attitudes towards paradigm shifts in the information industry among LIS faculty in Zimbabwe.

A closer examination of the data revealed no association between gender, level of education, experience and age among LIS faculty who indicated that ICT and information related subjects have demeaned and relegated traditional LIS core subjects to the periphery. However, the negative attitudes were apparent across all institutions offering LIS education and training. This might be attributed to prevalent organizational culture, strong professional dogmas, lack of knowledge and fear of change and the unknown. Glisson and Hemmelgarn (1998) findings demonstrated that organizational climate significantly impacted innovations outcomes in publicly funded services. Frambach and Schillerwaert (2002) suggested that organizational support for the innovations, leadership commitment, and organizational culture and climate, social influences and education levels play a significant role in the adoption of new innovations.

Another 29% (9) suggest that ICT and information related concepts have broadened LIS education sphere of teaching and research. Their different views were summarized by a male lecturer stating,

...ICTs have redefined the LIS profession and given shape to the profession. Whereas all along the LIS profession has been operating like

an amorphous entity (without shape) but now with this current trend we begin to see the shape of the LIS profession. This has broadened our horizon of research and teaching.

The findings indicate an optimistic and favorable outlook towards paradigm shifts in the information industry. “Redefinition of the profession” suggest transformational changes characteristic of an emerging paradigm in LIS education and training. “Broadening opportunities” signified that the paradigm shifts have expanded the horizon of the LIS field. The data indicated that the shifts have brought unlimited horizons to the profession in terms of expanding work environments, diverse career choices, research opportunities, better job opportunities, better career prospects, respect, job satisfaction, professional value, professional legitimacy and high self esteem.

Furthermore, out of the nine (29%) who indicated that, “ICT and information related concepts have broadened LIS education spheres of teaching and research” all were holders of a master’s degree and have ten years or more experience. This suggests that LIS faculty with higher qualifications (master’s degrees) and experience were more positive about the benefits of paradigm shift than those without. This might be attributed to personal dispositional innovativeness, behavioral intention and self-efficacy. This was long-established by Aarons (2004) in his study concluding that level of education and level of professional experience are associated with positive attitudes towards adoption of an innovation.

Earlier studies by Apostle and Raymond (1987); Ostler and Dahlin (1995) also viewed the innovations as an opportunity for the LIS profession to grow. Apostle and Raymond (1987:21) declared that “the information’ terms carry higher status, managerial efficiency, and at least a partial negation of the low prestige connotation of the term librarian”. Anderson and Tushman (1990) hypothesized that once a dominant design emerges, the market becomes established. This suggests that 29% of LIS faculty is compatible with the changes taking place. Rogers (2003:15) “claimed that one dimension of compatibility is the degree to which an innovation is perceived as meeting the needs of the client system. When felt needs are met, favorable attitudes are formed and a faster rate of adoption usually occurs”.

The perspectives of the 25.8% who felt that integration of ICT and information related components in the LIS curricula have enhanced students enrollment, brought into focus the notion that personal experience with an innovation contributes to an individual's attitude (Sacks, Bellisimo and Mergendoller, 1993). Their views were summarized by a female lecturer noting, "... in this competitive environment, ICT and information related subjects have managed to boost the outlook of LIS education among potential LIS students".

The finding is corroborated with Feather (2003:40) study which found that "recruiting well qualified undergraduate students into LIS departments has for many years been difficult even for the leading LIS schools in the United Kingdom". The finding suggests positive experience with the innovation in LIS education and training. A study by Gardner, Dukes and Discenza (1993) also found that individuals who had positive experiences also espouse positive beliefs and attitudes towards the innovations. Rogers (1995) posited that the perceived observability of an innovation is positively related to its rate of adoption.

About 12.9% of LIS faculty who noted that ICT has rendered most of LIS education faculty's knowledge and skills obsolete suggest incompatibility of ICTs with the existing competencies. A lecturer stated,

LIS traditional competencies and skills have been made obsolete and the major challenge is enskilling ourselves in the face of the economic challenges and limited opportunities for continuous professional development.

The findings suggest a perceived gap between the available competencies and the required competencies in the LIS field. The data suggest a mismatch between supply and demand of LIS skills in the environment. In addition it also signifies a perceived need for enskilling of LIS professionals. The data attributed the need for enskilling to adoption of competency-destroying innovations in the profession. This signifies negative experience with ICT innovations in the LIS profession. Findings from Koohang (1989); Sacks, Bellisimo and Mergendoller (1993); Baack, Brown, and Brown (1991) confirmed this assertion, suggesting that there is a positive correlation between favourable attitudes and computer hands on experiences. The findings are consistent with Rogers (1995) claim that if a new innovation requires complex skills that are costly and time consuming to acquire, its rate of adoption is slowed.

5.4 Broader issues in HE

UNESCO (2009) called for the revitalization of higher and tertiary education in Africa to enhance its relevance to political, social, labour market, and economic realities. The findings of this study suggest HEIs are into the midst of revitalization to align the educational programmes to perceived environmental needs and demands. The reforms in HE are driven by advanced developments in ICTs, changes in the wide society and the need to align with economic needs of countries. This has led to the development and integration of new goals, course contents, teaching and learning modes, and instructional technologies in HE. However, the reforms are challenged by inadequacies in resources, capacity, funding, ICT infrastructure, policy and regulatory frameworks, leadership commitment, political will, and leadership capacity. This has resulted in unsystematic partial reforms. This approach, though laudable, provides short term solutions to the problems in HE. HE needs to be reengineered. This can only be possible if there is sustainable funding, political will, political stability, leadership commitment, management and faculty capacity, and a perceived need to change in the HE sector. Without these change antecedents in place, meaningful reforms in HE remain a yearning for most academics.

5.5 Summary of findings

The overall findings of the study revealed that the goals of LIS education and training are teaching and learning, research, community service/engagement, stimulating use and research about ICT and stimulating entrepreneurial culture. The competencies encapsulated in LIS curricula were LIS foundational/ core; technological; business/managerial; communication and community services; workplace competencies and interpersonal skills; legal framework for practice; practicum; research; and specialized competencies. LIS employers emphasized less on LIS technical skills and more on a mixture of professional, entrepreneurial, ICT applications and applied skills for efficient service delivery. The extent of ICT integration in the LIS curriculum is very low. Human and physical resources available for delivering LIS curricula are insufficient, but LIS faculty have high level of awareness and favourable attitudes about paradigm shifts in the information industry.

CHAPTER SIX

DISCUSSIONS OF FINDINGS

6.1 Introduction

The main purpose of the chapter is to interpret; explain the implications of the findings; and situate the research findings in the context of the existing body of knowledge, theories underpinning the study, and practice. The study sought to investigate the claims that LIS graduates were not “industry ready” (see also section 1.3) because they lacked requisite skills to perform immediately in their first jobs (Anderson, 2007). Given this problem the purpose of the study was to assess LIS education and training in Zimbabwe in the context of the paradigm shift in the information industry and how the indicators of change, mostly at the global level, reflect the interplay of these factors in Zimbabwe. The findings show that LIS education and training programmes are in the midst of revolutionary transformations and the indicators of change reflected at global level were apparent.

The chapter is made up of ten sections 6.2 focuses on the goals of LIS education and training; 6.3 discusses the competencies encapsulated in LIS curricula; 6.4 analyzes the skills needed by the information industry; 6.5 provides a critical analysis of the extent of ICT integration; 6.6 evaluates the available resources for delivering LIS education; 6.7 examines LIS faculty awareness about paradigm shifts; 6.8 discusses the attitudes of LIS faculty towards paradigm shifts in the information industry; 6.9 reviews the broader issues of the study; and 6.10 provides the synopsis of the chapter. A brief synopsis of the research questions that were addressed and the findings thereof is reflected in table 12.

Table 12 Outline of the specific research questions and key findings of the study

Specific research Questions	Findings
What are the goals of LIS education and training in Zimbabwe?	The goals of LIS education and training are teaching and learning, research, community service/engagement, stimulating use of and research about ICT and stimulating entrepreneurial culture.
What competencies are encapsulated in LIS curriculum?	The competencies encapsulated in LIS curricula are LIS foundational/ core; technological; businessmanagerial; communication and community services; —workplace competencies and interpersonal skills; legal framework for practice; practicum; research; and specialized competencies

Specific research Questions	Findings
What LIS skills are needed by the information industry?	The findings show that LIS work environments are demanding applied competencies and skills for information service delivery. A mixture of professional, entrepreneurial, ICT applications, generic and transferable competencies are required.
What is the extent of ICT integration in the LIS curriculum?	The extent of ICT integration in LIS curriculum is very low
What human and physical resources are available for delivering LIS curriculum?	The findings revealed that the human and physical resources available for delivering LIS curricula in Zimbabwe are: skilled human capital, ICT infrastructure and connectivity, physical infrastructure, national and regional policy frameworks, equipment, financial resources, information resources, time, practicum placements, up to date curricula and quality cohort of students. However, the available resources are insufficient.
What is the level of awareness by LIS faculty regarding paradigm shift in the information industry?	LIS faculty have a higher level of awareness and perceived knowledge of the paradigm shifts in the information industry.
What are the attitudes of LIS academics towards the changes in the information industry?	LIS faculty attitudes towards paradigm shifts in the information industry were favorable although small segments exist of those that harbor negative attitudes towards the shifts.

6.2 Goals of LIS education and training

The first critical question of the study was: “What are the goals of LIS education and training in Zimbabwe?” The findings revealed that the goals of LIS education and training in Zimbabwe were: teaching and learning, research, community service/engagement, stimulating use of and research about ICT and stimulating entrepreneurial culture. However, it is evident in literature that, since the inception of LIS education as an academic discipline in 1887, LIS education and training programmes have focused mainly on three goals: teaching and learning, research, and community service/engagement (Heim, 1986; Borko, 1984; and MacGragor, 2011). The results support the findings of SARUA (2010) and SARUA (2008) which also showed that the goals of HEIs in Southern Africa were teaching and learning, research and community engagement. This study however found the need to include among these traditional roles two new goals namely stimulating use of and research about ICT and stimulating entrepreneurial culture. The addition of these new goals in LIS

education and training, heralds the punctuation of the deep structure and the strategic reorientations or recreations. The reorientations or recreations are tailored at stirring the LIS discipline towards a new underlying order and the convergence of a new equilibrium period (Tushman and Romanelli, 1985). Using the Punctuated Equilibrium Theory to explain the data, teaching and learning, research and community service represent the old deep structure or underlying order in LIS education and training. The primary functions under which LIS education and training programmes were organized. This is in agreement with the claims of the Punctuated Equilibrium Theory that the “deep structure is the fundamental choices under which an organizations’ basic parts and units are organized; the basic activity patterns that maintains its existence; and its core beliefs, values, and strategy” (Provine and Stengers, 1984:154:287; Tushman and Romanelli, 1985:176).

6.2.1 Teaching and learning

The opinions given in the research data suggest that teaching and learning is one of the core functions of LIS education and training programmes. Heim (1986); Markey (2004); SARUA (2008a); and Pillay (2010) suggest that teaching and learning have had different degrees of primacy in different institutions of HE globally. Teaching and learning provide the opportunity to pass on professional core knowledge, foster critical thinking and creativity, and inculcate a sense of intellectual curiosity in LIS graduates (Heim, 1986). However, the evidence from the data seems to suggest that the goal of teaching and learning has evolved from the narrow library focus to a broader information transfer focus. This observation was readily apparent in LIS programmes nomenclature changes; evolving goals; integration of information and ICT related courses in the curricula; demand for new employability skills in LIS work environments; and the need for ICT related infrastructure, as well as faculty and student ICT capacity; ICT hardware and softwares to support LIS curricula. This finding corroborates findings of the KALIPER study which also made similar observations that LIS curricula in America were addressing broad-based information environments and information problems (the KALIPER Report, 2000 and Pettigrew and Durrance, 2001). Although the present study and the KALIPER study were conducted in different environments (Zimbabwe and United States of America respectively) with completely different socio-economic, technological, and educational development as well as strategies of growth and maturity of LIS education and training programmes, the findings are relatively similar. This similarity might be attributed to the comparable research methods used (surveys, case studies,

document reviews and interviews) and the subject under study (LIS education). It is evident that LIS education and training problems have global applicability.

The findings indicate that LIS education and training has responded to the global trend in HE where educational programmes are being revitalized to realign with the changes in the wide society, ICT developments and economic realities. This observation connotes that the deep structure of LIS education and training is shaped with events taking place in its environments (Gersick, 1991) and how it exchanges resources with the environment in which it operates in (Prigogine and Stengers, 1984).

The research data suggest that there is more emphasis on teaching in LIS education and training than on research and community service/engagement. SARUA (2008a); Heim (1986); MacGregor (2011); and Butcher, Wilson-Strydom, Hoosen, MacDonald, Moore, and Barnes (2008) concurred that HEIs give emphasis to teaching and learning while research and community service/engagement are often neglected. Empirical research by SARUA (2008a) exemplified the findings highlighting that universities in the SADC region place 65% of their focus on teaching and learning, 22% on research, and only 11% on community engagement. Watson, Kotecha, Perold, Chetsanga, and Burke (2010) elaborated further that universities in Zimbabwe have had a strong focus on teaching and learning (approximately 57%); weak emphasis on research (approximately 28%); and an even weaker focus on community service (approximately 15%). Using the Punctuated Equilibrium Theory inferences to analyze this data this suggests that HEIs in Zimbabwe are structured according to 57% teaching and learning; 28% research; and 15% community services. This structure can be generalized to LIS education and training as well. This signifies what HE programmes offer to their publics and its stakeholders (Gersick, 1991).

In addition, the findings suggest that emphasis on teaching and learning in LIS education and training might be attributed to factors such as orientation, maturity, available resources, workloads, and socio-economic factors.

a) Orientation of LIS education programmes

LIS education and training is offered at both TVET and university levels. This suggests that LIS education and training operates within a dual sector environment. These education sectors are considered as independent of each other, are guided by different policies, learning objectives, models and outcomes. TVET is described as “education and training which aims to equip people with knowledge, know-how, skills and/or competencies required in particular occupations or more broadly in the labour market” (Cedefop, 2008a:202). University education is described as general academic education offered at universities with a strong theoretical and research orientation (Pillay, 2011). SARUA (2010) point out that most HE institutions in Zimbabwe are regular teaching and research oriented institutions, while some tend to be teaching institutions only. The research data suggest that there are no HEIs in Zimbabwe which can be regarded as research intensive institutions. It can be argued that the orientation of LIS education and training programmes impacts on the degree of emphasis on teaching and learning or research.

b) Maturity of LIS education programmes

Furthermore placing teaching and learning ahead of other goals might be attributed to the relative young age of LIS education and training programmes in the country. The history of the development of LIS education and training in the country suggest that LIS education and training is at its early stages of development, with all of LIS education programmes having been established in the past three decades (Hikwa, 2010). The data indicate that LIS education and training programmes in Zimbabwe are immature and they lack the capacity to attract high profile researchers and robust funding. The finding is in agreement with Arnold, Lonn and Pistilli (2014) who assert that the maturity of HEIs is an important factor in attracting research funding, established international researchers and high profile research projects. The immaturity of LIS programmes may be the reason why teaching and learning is emphasized rather than research.

c) Available resources

Moreover, emphasis on teaching and learning can be attributed to the available resources. Mayasari (2010) suggests that the resource base of an organization determines its focus, behavior and routines. The findings show that the socio-economic challenges in the country have negatively impacted on the availability of resources to support LIS curricula. The inadequacies in terms of capacity, funding, ICT infrastructure, information resources and

policy and regulatory frameworks have provided little alternative for LIS education and training programmes other than teaching and learning. Tushman and Romanelli (1985:177) note that even if a system can overcome its own cognitive and motivational barriers against realizing a need for change, the networks of interdependent resource relationships and value commitments generated by its structure will often prevent it from being able to achieve the required change”.

d) Faculty work overload and socio economic factors

Likewise the focus on teaching and learning can also be attributed to work overload and socio-economic factors. The increase in demand for higher education and increases in the number of students enrolling in HEIs has resulted in parallel or block release programmes being developed and run concurrently with conventional programmes. As a result of socio-economic factors LIS faculty are forced to teach in as many parallel programmes as possible in addition to normal teaching leaving no time for them to engage in other academic pursuits such as research or community service/engagement (Watson et al. 2010). It is noticeable in the data that conventional LIS education and training programmes are run concurrently with parallel programmes, and all post graduate programmes are provided on block release or part time basis (See table 9, 109-110). This is supported by Okello-Obura and Kigongo-Bukenya (2011) who noted that LIS faculty in Uganda are engaged in too much teaching and learning rather than research in order to earn extra income.

6.2.2 Research

The data reveal that research is critical for LIS education and training; however this is not prioritized in both TVET and universities in the country. The SARUA (2010) study established that more than two-third of lecturers in state universities in Zimbabwe lacked research skills and experience. The research capacity inadequacies negatively affect mentorship and supervision of student's research studies especially at higher degree levels (PhD) in LIS education and training in Zimbabwe. Alimohammadi and Jamali (2011) and Heim (1986) concurred that when teaching is prioritized in HE, there is a tendency for teaching to take the limelight from the other goals. This suggests that the goals of research and community service/engagement are overlooked in LIS education and training.

The scarcity of experienced and qualified faculty in Zimbabwe can be ascribed to the exodus of qualified and experienced academic staff to the Diaspora, due to the political and economic turmoil experienced in the country for the past two decades. The exodus created capacity gaps in HEIs and specifically in LIS education and training programmes. This has negatively impacted on the HE research capacity, development of research skills and mentorship (Watson et al., 2010). The new breed of LIS academics that joined the faculty ranks in LIS education and training institutions, after the flight of experienced faculty, lacked doctoral qualifications, research experience and international research visibility (SARUA, 2010). They are therefore unable to attract robust research funding and high profile research projects (SARUA, 2010). The data suggest the need to revitalize LIS education and training in terms of research capacity. However, fragmented institutional efforts to revitalize research have been observable in Zimbabwe. For example, NUST has established an Innovation Center. The aim of the Innovation Center is to advance and leverage research (SARUA, 2010). In addition NUST has requested SARUA's support for experienced academics in the region who can mentor research in their respective field (SARUA, 2010). Meanwhile, the University of Zimbabwe has requested staff exchanges, collaboration, and short-term visits by experienced researchers to support the research capacity of its faculty (SARUA, 2010).

Biographical data from this study reveal that there is only one faculty member in LIS education and training programmes in the country with a doctoral degree. The PhD holder is a non teaching dean. The data suggest that LIS education and training programmes in Zimbabwe lack the capacity to offer PhD programmes although it is documented in their curricula that PhD degrees are offered at NUST and ZOU see Table 9 (chapter 5, p.112-113). Further examination of the data suggests that LIS education and training programmes in Zimbabwe have not conferred PhD degrees since their inception. This suggests low research outputs in LIS education and training. SARUA claimed that increasing the "quantity and the quality of postgraduate studies increases research output, quality of research, high-level research skills, and contributes to the development of quality future academics for the region" (SARUA, 2010:9). However, O'Byrne (2011) and Murray (2014) raised some concerns over the correlation between doctoral degrees and research output. They argued that there is no correlation between holding a doctoral degree and increased research productivity. Wallace (1985:403) maintains that there is "little doubt that in the aggregate the increase of PhD faculty and doctoral candidates positively affects total research output", a view also

advocated by (Heim, 1986:595) who noted that “an increase in PhD enrollments in LIS education and training programmes positively contributes to research outputs”.

6.2.3 Community service/engagement

The research data identified community service or engagement as one of the goals of LIS education and training. However, this goal is regarded as a ‘Cinderella mission’ (not just a fairy tale mission but more like a girl child relegated to inferior status) in most institutions of HE in the SADC region (MacGregor, 2011). Kotecha (2008a) acknowledged that this goal has been implemented inconsistently in HEIs across the globe. Recent studies by SARUA (2008a) found that in the SADC region, HEIs placed 11% of their focus on community engagement. A similar study also found that HE institutions in Zimbabwe put 15% of their focus on community service (SARUA, 2010). The findings signify that the goal of community service/engagement is not emphasized in LIS education and training. The data attributed this to socio-economic factors, diminishing public purpose, negative attitudes toward community service/engagement and lack of capacity. The economic down turn that has beset Zimbabwe from 2000 to date heralded an era of diminishing public purpose and increased private interest. This led to the ‘survival of the fittest’ culture in the general populace and specifically among LIS faculty. LIS faculty were forced to sell their expertise to the community they serve for a fee in order to make ends meet. Furthermore, from the researcher’s experience, heavy workloads led LIS faculty to regard community service/engagement as an extra workload that should be shunned at all cost. Moreover, the perceived benefit and value of community service/engagement was not visible to LIS faculty due to the dearth of inspirational leaders (Brindley, 2006).

6.2.4 Stimulating use and research about ICT

Stimulating use of and research about ICT was highlighted as a major function of LIS education and training programmes. The addition of the goal of stimulating use of ICT and research about ICT signifies acceptance and integration of ICTs innovations in the LIS profession and its academic discipline. The finding reinforces Durrance’s (2004) assertion that libraries and librarians have always been early adopters of information and communication technology innovations. However, the infusion of the new innovations in the LIS profession revolutionized the whole essence of the profession (Gorman, 2004); its services (Gerolimos, 2009); skills and competencies (Shannon, 2008); roles of the LIS

profession (Huckle and Watson, 2007); and workplace practices (Rifkin, 1995). This brought an imperative in LIS education and training to stimulate the use of ICTs in the profession. In addition, this goal is used as a strategy for technological transfer in the profession and the LIS academic discipline. Similarly the inclusion of the goal is expected to generate understanding, provide evidence based information, and stimulate applied research on ICT related-issues in the profession.

6.2.5 Stimulating entrepreneurial culture

Stimulating entrepreneurial culture was also identified as one of the goals of contemporary LIS education and training. This is exemplified by the presence of entrepreneurial courses or modules in LIS education and training curricula. The socio-economic and political environment in Zimbabwe has forced many companies to either suspend or to reduce production in Zimbabwe (Chetsanga, 2010). This has resulted in high unemployment rates in the country. It is against this background that it became imperative for the government of Zimbabwe to curb unemployment among HE graduates. A directive was given to all HEIs to introduce entrepreneurial courses in their curricula. The entrepreneurial courses or modules were meant to instill and foster an entrepreneurial culture in HE graduates. This was intended to transfer job creation skills and foster a spirit of self employment (Pink, 2005). ILO and UNESCO (2006) confirmed that entrepreneurial education fosters a spirit of self employment among graduates. In addition it introduces creativity and entrepreneurial thinking skill sets associated with job creation (Robinson, 2006 and Pink, 2005). Accordingly, the inclusion of goals like stimulating entrepreneurial culture in LIS education is a response to a government directive. The purpose of this is to address the unemployment problem in the country through job creation, wealth creation, youth empowerment, and socio-economic growth through human capital development (ILO, 2011).

The inclusion of goals such as stimulating use of and research about ICT and stimulating entrepreneurial culture shows that LIS education and training programmes have willingly stepped out of the confines of established traditional goals of teaching and learning, research, and community service/engagement in search of new goals and visions. This signifies major educational reforms in LIS education and training in response to perceived environmental demands and needs. The findings reinforces Cheng (2001a) assertions that reform in higher

education is tailored in pursuit of new visions meant to realign HE education with socio-economic needs, technological transfer, life-long learning, and global networking.

6.3 Competencies encapsulated in LIS curricula

The second critical question of the study was: “What competencies are encapsulated in LIS curricula?” The findings revealed that foundational/ core; technological; business/managerial; communication and community services; workplace competencies and interpersonal skills; legal framework for practice; practicum; research; and specialized competencies are encapsulated in the LIS curricula. It is evident that some of these competencies are classified as professional core knowledge in the profession. This core knowledge is: information resources, information management, information access, information system and technology, research, and information policy, as suggested in IFLA, CILIP, ALA, and SLA published competency frameworks (Tenopir, 2002 and Lester and Van Fleet, 2008). However, LIS education programmes in Zimbabwe do not conform to any published professional competency frameworks. Lester and Van Fleet (2008) stated that this phenomenon is not unique to the Zimbabwean context alone but is a global phenomenon. They further claimed that apart from North America, Canada and some parts of Europe, the published competency frameworks are little-known in most LIS schools. However, the data suggest LIS education and training are conforming to professional trends. This might be the reason why some of the competencies offered fall within the categories of the published competency frameworks. According to the Punctuated Equilibrium Theory the professional core competencies represent the deep structure of LIS education and training. Gersick (1991:15) defined the “deep structure as a network of fundamental choices of the basic configuration into which a system’s units are organized and how the system exchanges resources with its environment”.

6.3.1 Articulation of LIS education and training qualifications

Education and training of LIS professionals and para professionals is undertaken at two separate levels (undergraduate and postgraduate) and is offered at HE level. Departments of LIS in universities offer four levels of qualifications: undergraduate, post graduate diploma, masters, and doctoral. The entry point to professional LIS work is through an undergraduate degree or post graduate diploma. Raju (2003) and Minishi-Majanja (2009) corroborated the

finding claiming that the undergraduate degree or the postgraduate diploma is the entry point to LIS professional work in Africa (Raju, 2003 and Minishi-Majanja, 2009).

Polytechnic colleges offer four levels of qualifications: National Certificate, National Diploma, Higher National Diploma, and Bachelor of Technology in LIS. The National Certificate is the entry point to paraprofessional work while the Higher National Diploma is the entry point to semi professional work (Following the national diploma qualification, the Higher National Diploma is an advanced diploma which require one year of further studies) in Zimbabwe. Raju (2004) reaffirmed that in most cases the National Diploma is the established paraprofessional LIS qualification. According to the Punctuated Equilibrium Theory LIS levels of qualification suggest the –core beliefs, core competencies, and values, its employees and its environment; products, market, technology and competitive timing; distribution of power; and the organization’s structure” (Gersick, 1991:15).

In addition table 9 (chapter 5, p.112-113) shows that LIS education and training is strongly oriented towards undergraduate level qualifications. The number of undergraduate courses offered by LIS education and training institutions, when compared with the postgraduate programmes available, provided evidence to support this observation. This signifies that LIS education and training programmes in the country are undergraduate-focused. Wormald (2013) suggests that undergraduate-focused higher education institutions are less research-intensive than postgraduate-focused institutions. Alimohammadi and Jamali (2011) point out that in highly ranked universities, research is more important than teaching. Likewise Hutchins (1936:175) asserts that –A university may be a university without doing any teaching but it cannot be one without doing any research”. The findings suggest that LIS education and training institutions in Zimbabwe are not research focused. This was attributed to the high cost of post graduate studies, lack of capacity to teach higher degrees, and lack of perceived need of higher qualifications from LIS work environments (Minishi-Majanja, 2009 and Feather (2003). In this regards, Feather (2003) claimed that full time post graduate studies in the LIS field are less attractive to students in the UK. He attributes this to the high cost of post graduate studies. Minishi-Majanja (2009) concluded that most LIS employers in African countries require a lower level of qualification as they cannot afford to pay for higher level qualifications. The findings endorse the Punctuated Equilibrium Theory assumptions that the –activity pattern of a system deep structure reinforces the system as a whole, through mutual feedback loops” (Gersick, 1991:16).

Quality assurance and accreditation for TVET LIS programmes is managed by HEXCO. University programmes have autonomy over their qualifications. The research data suggest that the LIS education and training accreditation system is fragmented. This suggests that LIS education and training programmes are not standardized and coordinated. The data revealed that there is lack of standardized operational frameworks in LIS education and training. Standardized operational frameworks facilitate comparability, permeability of qualifications and mobility of students across programmes. Raju (2004:14) stated that it is critical —that education systems should allow for articulation between professionalism and paraprofessionals giving one the opportunity to satisfy certain requirements before ‘crossing over’ to LIS professionalism if one so desires”. Braun (2008:230) noted that there is strong evidence that —accreditation bodies minimize duplication and overlap of effort; avert policy inconsistencies; reduce the chances of conflict, both bureaucratic and political; seek coherence and cohesion and an agreed ordering of priorities; promote comprehensive or whole government perspective against the constant advocacy of narrow, particularistic or sectoral perspectives”. The findings revealed a perceived need for a centralized accreditation body for assessing the quality of LIS education and training programmes. Cleveland (2011) corroborates the finding, asserting that a centralized organization is necessary for maintaining order, standards, quality control and meeting the expectations of the profession and industry.

Moreover, the data show that all LIS education and training programmes in Zimbabwe have retained the name Library and Information Science (LIS). This is consistent with global and regional trends in the field. LIS departments have either retained the “Library” word or dumped it and embraced the “Information” word or have completely decoupled themselves from LIS (Galvin, 1995). For example at the University of Kwa-Zulu Natal, Limpopo, Pretoria, Zululand and University of South Africa (UNISA) LIS education programmes have adopted the new nomenclature: “Department of Information Studies”. The University of Johannesburg (UJ) and Stellenbosch (US) have completely decoupled from the tenets of traditional LIS and have encompassed ICT, and the Information and knowledge management principle (Ocholla, 2000 and Ocholla and Bothma, 2007). They have evolved into completely different species competing for survival with their ancestral relatives, LIS (Eldridge and Gould, 1972).

LIS education and training programmes fall under the Faculty of Communication and Information Science (NUST); Faculty of Applied Social Sciences (ZOU); Division of Applied Sciences (Bulawayo Polytechnic); and at times are independent departments (Harare Polytechnic). This has been an observable trend in LIS education and training in the region. For example some of the larger LIS schools in South Africa such as University of South Africa, University of Pretoria, University of Zululand, Fort Hare, and the University of the Western Cape are independent academic units and the remainder are affiliated to a parent unit". (Raju, 2013:7). Tuckman (1965) drawing from the Punctuated Equilibrium Theory suggested that when LIS education and training programmes are under a broad faculty they lose autonomy over choices with regards to boundaries, norms and work methods. Tuckman (1965) claims that although LIS departments might be under the influence of a larger parent unit they also maintain differences in the sequence and manner in which they settle their choices, focus, boundaries, norms and methods.

6.3.2 Competencies encapsulated in LIS curricula

The findings revealed nine broad categories of competencies encapsulated in LIS curricula: foundational or core; technological; business/managerial; communication and community services; work place competencies and interpersonal skills; legal framework for practice; practicum; research; and specialized competencies. Similar studies done in the African context (South Africa and Kenya respectively) by Raju (2003) and Shiholo (1999) also found a broad spectrum of competencies and skills encapsulated in LIS curricula.

The diversity of the competencies in the research data revealed that LIS programmes have adopted a general approach in the education of LIS professionals. The finding corroborates the KALIPER Report (2000) observations that LIS education and training is addressing broad information environments. Hazeri, Martin and Sarrafzadeh (2009) praised this educational approach stating, that the education of LIS professional has transcended traditional boundaries to include wider professional horizons. This suggests that LIS education programmes have discarded the discipline-specific model of education and adopted a more liberal and general education model. The finding is in agreement with Hallam's (2008) observations that contemporary LIS programmes are no longer limited to discipline-specific knowledge. Mizrachi (1998) and Buckland (2001) support the liberal model of education in LIS. They suggested that a liberal education enables LIS education and training programmes

to instill information and ICTs related competencies as well as context specific skills in LIS graduates. In addition they argued that a liberal education inculcates in LIS graduates generic and transdisciplinary competencies critical for service provision. Buckland (2001) regarded the previous LIS practice based education model as restrictive. He believed the liberal and general approach liberated the LIS academic discipline from the confines of the monotonous practice based education. Buckland (2001) is optimistic about the new model of education in LIS, claiming that it offers unlimited opportunities in terms of research, teaching, as well as the growth and maturity of the LIS academic discipline. According to the assumptions of the Punctuated Equilibrium Theory, the shifting educational models suggest strategic reorientations and adaptive measures tailored to achieve higher levels of efficiency (Romanelli and Tushman, 1994).

The commonality of the competencies across LIS education and training sectors (university and TVET) signify that traditional boundaries between paraprofessional and professional have been dismantled. This was also observed by Broady-Preston (2009) when she noted that the use of ICTs in the profession has flattened professional hierarchies. This has led to the questioning of the rationale of the binary divide of university and TVET educational systems (Cedefop, 2011). However, the binary divide of university and TVET educational systems was beyond the scope of this study. Further research is required to understand the rationale of the binary divide in LIS programmes in Zimbabwe.

In addition, the diversity of the competencies in the LIS curricula signifies academic programmes in the midst of a revolution period as presumed in the Punctuated Equilibrium Theory. The research data suggest that the deep structure of the LIS academic discipline has come apart, leaving it in disarray until the revolutionary period ends, with the “choice” around which a new deep structure forms” (Gersick, 1991:20). The revolution has also been symbolized in the LIS work environments where new competencies are required as new innovations are released in the market (Hallam, 2007) and competencies have acquired a life span (Markey, 2004). This suggests that LIS education programmes are operating within the context of an emerging paradigm where future competencies can be dimly predicted (Bobinski, 1989). Moran Marchionini (2012:v) confirmed this, claiming that it has become “more difficult to foresee the preparation needed for future information specialists and to predict the information environment where our graduates will be working even a decade from now”. Therefore, the Punctuated Equilibrium Theory claim that “revolutions outcomes, based

on interactions of a systems' historical resources with current events, are not predictable; they may or may not leave a system better off" (Gersick, 1991:20). However this assertion should be given considerable thought when charting a new educational pathway for the LIS profession.

Tyler (1952) recommended that professional education should be based on a deeper understanding of the users of the professional service and environment in which the profession operates. Cleveland (2011) opined that new educational pathways for the LIS professional must be based on the core principles of library and information science, information and technology. This study suggests that education for LIS professionals should be based on the core principles of the profession (information service delivery: acquisition, organization and user services) that has stood the test of time, in addition to information, technology, and multi/transdisciplinary aspects to support practice. The core tenets of the LIS profession enable graduates to have a deeper understanding of the essence of LIS practice. Understanding the essence of LIS practice allows graduates to set in context and exploit information, technology and multi/transdisciplinary competencies for efficient information service delivery.

Additionally, the multiplicity of the competencies encapsulated in LIS curricula raises issues of depth of coverage, core competencies, time dimensions, and expected learning outcomes. Scholars like Boll (1972); Bobinski (1989); Stilwell (2004); Hallam (2007); and Raju (2005:70-71) have raised concerns as to whether it is practicable for LIS departments, and whether they have the time and resources, to teach all that has to be taught. Yet, more often than not, LIS education is offered as a ~~one~~ year postgraduate level qualification, in which there are clear expectations that students should acquire a high level of theoretical knowledge" (Hallam, 2007:15). Stilwell (2004:22) in her response to these concerns stated that ~~no~~ single department is likely to have the capacity to span the full spectrum of programmes required". Likewise, Bobinski (1989) reiterated that it is difficult to cover the diverse competencies in the time allotted in LIS curricula.

However, Stilwell (2004), Raju (2005), and Hallam (2007) argue for the need to balance the core knowledge relating to time dimensions in the curricula. Cronin (1985:14) cautions LIS departments: ~~to~~ retain their hold on the 'information whole' and provide foundation courses on the fundamentals of information work infused with specialized professional tracks. Or

concentrate on a limited number of career tracks and offer tailor made courses for a particular operational environment”, while Stoffle and Leeder (2005) contend that LIS education and training programmes should offer specialized training or expand the programmes in terms of content and credit hours. Stoffle and Leeder (2005) concluded that in the absence of this, LIS programmes need to remain generalized and take into account the wide-ranging demands of the profession in order to best serve their students. Cedefop (2011:28) opined that an academic discipline in transition must “re-examine its pact with society and its rationale, identity, and foundations, its ethos, code of behavior and primary allegiances and loyalties.” The purpose if this is so that it can be transformed in accordance with its basic purpose and the needs of the society it serves. The conflicting perspectives suggest that Boll’s (1972) propositions in his five theories: One Profession in One Year Theory; Maximum Flexibility in One Year Theory; Changed Emphasis Theory; Growing Single Profession Theory; and Structured, or Several Sub-Professions Theory, must be given due consideration in contemporary LIS education and training.

There is evidence in the results that Continued Professional Development (CPD) and lifelong learning are not vital components of LIS education and training programmes. This finding validated common assertion in literature that traditional higher education curricula usually fail to tackle subjects in lifelong learning, work-based learning and CPD (Broady-Preston, 2007). Given the prevailing socio-economic condition in the country, the absence of CPD and lifelong learning initiatives can be attributed to lack of capacity, funding and resources to support extracurricular programmes. The prevailing socio-economic environment in the country has spawned utilitarian concerns about economic costs and subsequent career returns on educational investments (Chopra, 2012).

In addition, lack of CPD programmes in LIS education might also be attributed to lack of faculty experience and knowledge of professional practice. The research data suggest that most of the academics in LIS education and training programmes have never practiced in the profession, lack advanced degrees, and specialized knowledge, have poor research output and lack collaborative linkages with practitioners. The research data attributed this to the fact that the majority of LIS faculty were absorbed in faculty ranks as teaching assistants immediately after graduation. These teaching assistants were appointed to faculty ranks without practice-based experiences in the profession. Lack of practice-based experiences, specialized

knowledge and exposure to professional trends suggest that these academics are not capable of delivering meaningful and effective CPD programmes. The knowledge and experience gaps raise anxiety and confidence issues among LIS faculty. Broady-Preston (2007) advocated the establishment of collaborative linkages between LIS faculty and practitioners so that there are reciprocal synergies.

a) Foundational/core competencies

The research data suggest that the LIS curricula have not abandoned the core tenets (acquisition, storage, retrieval and use). This was noticeable by the existence of competencies such as cataloguing, classification, subject analysis, indexing, collection development and management, and evaluation of information sources, for example, designed to inculcate professional principles in LIS graduates. The finding agrees with Lemkau's (2008) claim that LIS education and training should be founded on the professional principles of information acquisition in different formats, information storage, and information communication and use. Accordingly, Galvin (1995) considered the grounding of professional education in its principles as laudable. He affirmed that these are the forms of knowledge that have stood the test of time. These professional principles will continue to inform the profession long after the technological specific and object-orientated competencies have been relegated to the historical shelves of academic archives (Galvin, 1995).

b) Technological competencies

The findings revealed that traditional LIS core knowledge has lost preeminence in LIS curricula to ICT related competencies and skills. This was confirmed by Moran and Marchionini (2012), who state that LIS programmes have become ICT focused. The prevalence of ICT related courses and modules in the curricula signify the institutionalization of ICTs in the LIS profession and its professional education. This demonstrates "full use of ICT innovations as the best course of action available" (Rogers, 2003:177) in the LIS profession and its education and training.

c) Business/managerial/entrepreneurial competencies

The occurrence of business/managerial/entrepreneurial competencies in LIS curricula signifies the adoption of the entrepreneurial model in information service provision. Katz (1974) emphasizes that these skills are essential for administrative purposes in work

environments. The finding revealed that LIS professional competencies are no longer confined to discipline specific competencies. Cleveland (2011) claimed that the LIS academic discipline has integrated inter/multi and transdisciplinary competencies to nurture and develop a new generation of LIS professionals.

d) Communication and community services competencies

The integration of communication and community service competencies in LIS curricula bears evidence of a user centered information paradigm. Bronstein (2007) confirmed that the information paradigm has shifted LIS practice and its professional education from a system-oriented approach (that focused on how the system works) to a user-centered approach (that centers its attention on the users' information needs and behavior). This shift has revolutionized information service delivery, roles, and the nature of LIS professional work (Bronstein, 2007). Therefore, the integration of communication and other user-centered supportive subjects in LIS curricula is intended to equip LIS graduates with “people’s skill” integral for information service delivery. The European Council of Information Association (ECIA), (2004) noted that communication skills are also important for research, training, marketing, consultancy and brokering and advocacy purposes. Nonthacumjane (2011) reiterated further, stating that communication skills enabled LIS professionals to broker e-resource licenses, negotiate information deals with publishers, and publish academic and students scholarly works in institutional repositories (Nonthacumjane, 2011). Maurice (2012) cautions that societal communication tools and culture have evolved as a result of advanced developments in ICTs. Consequently, LIS communication competencies that are integrated in the LIS curricula need to be developed around the new communication technologies.

e) “Work place competencies” and interpersonal skills

The existence of workplace competencies and interpersonal skills in LIS curricula indicate that interpersonal, generic and transferable skills have gained importance in the curricula. This was confirmed by Pettigrew (2013) when he confirmed that skills that were previously not emphasized which may not always be innate but learned through experiences and are present in the private or commercial sectors have gained impetus in the LIS curricula. Tenopir (2002) declared that these competencies are vital for LIS professionals to market themselves, their services, and build customer loyalty.

f) Legal framework for practice

The research data revealed that competencies designed to instill legal, ethical and professional ethics, norms and values have become basic elements of LIS curricula. Pettigrew (2013) points out that it is easy to contravene IPR regulations in digital environments. IFLA (2013) suggest that instructions in IPR issues raise awareness and instill ethical values in LIS graduates. Moran and Marchionini (2012:vii) claim that integrating competencies in information ethics “provide a fundamental base for building educational programmes rooted in core values”, a view also espoused by Ocholla (2009) who acknowledged that teaching and learning about IPR issues, encourages LIS professionals to acquire competencies which are requisite for practice, so that they apply correct moral, professional obligations in their duties.

g) Practicum/internship

The presence of practicum or industrial internship as a compulsory part of the curricula suggests a drive towards mutual enrichment of abstract knowledge with practice based competencies in LIS education and training. This was confirmed by Olsen (2007:28) when he noted that the existence of the practicum course in university curricula signifies the “fall and rise of institutional structures and associated systems of normative and causal belief and resource”. The data shows that university education has integrated vocational aspects in their curricula. Young and Raffe (1998) asserted that the trend towards vocationalization of university education is meant to infuse practice based competencies in university education. This might be attributed to the need to bring university education in line with TVET or align university education with the needs of the industry. This confirmed Gersick’s (1991) claim that systems tend to outgrow the deep structure that governs their perspectives and activities.

h) Research

The findings show that research competencies are an integral part of the LIS curricula. The Medical Library Association (2007) emphasized that research competences instill in LIS graduates writing, communication, analytical, reporting, presentation and qualitative and quantitative competencies and skills vital for practice. McKnight and Hagy (2009) and Krishna (2009) claim that research education stimulate’s evidence-based practice and knowledge production which informs practice.

i) Specialized competencies

Integration of specialized competencies such as health information services, children's librarianship, afro-centric librarianship, indigenous knowledge systems for example, signify attempts to infuse specialized professional tracks in the LIS curricula. The research data suggest that LIS faculty in LIS education programmes lack specialized knowledge covering health informatics. This suggests that although a module on health information systems may have been integrated in the LIS curriculum LIS faculty are unable to transfer useful competencies in this area to graduates. However, the attempts are driven by the perceived need to provide specialized professional tracks that offer diverse career options to LIS graduates. In addition it might be driven by the need to meet the demands in the labour market for specialized competencies. The data suggest the need for diverse professional tracks in LIS education and training.

In addition, the inclusion of specialized courses such as indigenous knowledge systems and afro-centric librarianship suggests attempts to integrate African perspectives in the LIS curricula (Roy, Trace and Gilbert, 2013 and Bitso, 2013). This model of education was advocated by Mbeki (2005) when he suggested that all educational curricula should be grounded and oriented towards African perspectives, a view shared by Johnson (2007:66) who observed that "without applying the theory and practice of LIS to local conditions, LIS schools risk becoming pale reflections of their Western models".

6.4 Skills needed by the information industry

The third specific question of the study was "what LIS skills are needed by the information industry? The findings show that LIS work environments are demanding applied competencies and skills for information service delivery. Similar studies by ECIA (2004), Kumar (2010), and Gerolimos (2009) which investigated the skills and competencies required of LIS graduates, found similar findings. The similarity of this study and the findings of Kumar (2010) and Gerolimos (2009) might be attributed to the relatively similar methodologies used and the global propensity of LIS issues.

6.4.1 Theoretical versus applied competencies and skills

The research data revealed that LIS employers value and emphasize applied skills more than theoretical knowledge. This finding brought to the fore the question of theory in opposition to practice in LIS curricula. Galvin (1995:1) questioned "whether the most important obligation

of a professional school is to give students the practical knowledge and skills needed for entry-level jobs or to provide a theoretical base for lifelong career development". There ~~appears~~ appears to be no solution from academics about how best LIS education and training can strike an optimal balance between theory and practice in the curricula" (Galvin, 1995:1; Lynch, 2008; and Chu, 2010). LIS educators believe that LIS curricula should emphasize theory and principles rather than applied skills (Virkus, 2012). Shera (1973:335) in his response to this concern stated that "... education is not a substitute for experience, but a preparation for it. Librarianship . . . must abandon the practice of putting its students through little fake experiences in the classroom'. We must teach pupils theory, not techniques: principles not practice".

Similarly Vickery (2004:29) reinforces the point further cautioning that ~~teaching~~ teaching practice is only possible in a very static profession. In this dynamic and transient environment it is more beneficial for LIS graduates to acquire general grounding in a wide variety of professional activities and concerns; so that they have a general educational base applicable to any LIS related work environments". This perspective is strongly supported by Bawden and Robinson (2012) who argued that it is much more valuable for students to have a deeper understanding of theories, principles and concepts on which they can nurture and develop their profession through practice, lifelong learning and Continuing Professional Development and Workplace Learning (CPDWL).

Scholars like Galvin (1995), Young and Raffe (1998) and Augustyn and Cillié (2012) see nothing wrong in modest vocationalization of professional education programmes. Galvin (1995), Augustyn and Cillié (2012) and Raju (2013) concur that librarianship, archival administration, records management, law, medicine and industrial psychology are applied disciplines that evolved out of practice. Therefore their rationale as academic disciplines cannot be justified without taking cognizance of their applied nature. They further state that it is for this reason that applied disciplines cannot completely decouple from practice. Young and Raffe (1998) regard infusion of theoretical and applied skills in HE education systems as an innovative way of achieving parity of esteem between practical-training and theoretical-training. They further argue that the infusion of theory and practice draws the vocational and general education systems in line with each other and with new, labour market demands. Galvin (1995:3) cautions that the ~~issue~~ issue of theory versus application is not an ~~either-or~~ "either-or" choice, but a matter of ~~some of both~~ "some of both". The question worth asking then is, how much of

each? What is the optimal mix? And how does that optimal mix change over time, with changing conditions in the field?”

6.4.2 Broadening of LIS work environments

The trans-disciplinary nature of the competencies identified by LIS practitioners signifies that the LIS work environments have expanded beyond libraries (Sacchanand, 2012) roles of LIS professionals are evolving (Myburgh, 2010) and traditional LIS technical competencies have lost their pre-eminence, while personal and transferable skills traditionally not taught in the LIS curricula have gained importance (Subramaniam and Jaeger, 2011). This signifies a paradigm shift in the roles of LIS professionals and work environments. Moran and Marchionini (2012:v) confirm the paradigm shift, noting that the LIS profession has evolved from a “world where information was contained within walls in finite containers such as books and filling cabinets to one where information is virtual and omnipresent”.

6.4.3 Complexity and diversity of LIS work environments

The rationale of the different competencies and skills required of LIS graduates in the work environment might be attributed to the complexity and diversity of LIS professional work environments and the diversity and complexity of tasks performed by LIS professionals in current information environments. This interpretation is consistent with Dinov’s (2008) assertion that the current information environment demands LIS professionals who are able to reason independently, integrate trans-disciplinary knowledge and skills, and make informed decisions in situations where no single discipline or methodology is likely to solve a problem completely. This suggests that professional competencies and skills are shaped by the demands of LIS education and training environments, the nature and types of roles, member’s experiences, and available technologies. Gersick (1991) reinforced this, noting that organization systems “... discover their inadequacies and generate new needs that the old structures cannot meet” (Gersick, 1991:22).

6.4.4 Teaching/training skills

Teaching/training competencies are highly sought after and valued in today’s LIS work environments. Rapple (2014) and Campbell (2006) stated that teaching and training skills have become valuable in LIS work environments. They attributed this to the integration of

Information Literacy Skills modules (ILS) in academic programmes globally. Rapple (2014) noted that LIS professionals are called on to teach ILS modules and create online ILS tutorials without the relevant pedagogy. He further argued that it is high time LIS graduates are inculcated with the theory and practices of pedagogy, to enable them to transfer information skills to users. Myburg (2010) and Mammo (2011) reiterated that the teaching roles require information professionals to have corresponding proficiency in pedagogy, instructional assessment, evaluation methods, presentation and communication. Mandernack (1990) point out that very few LIS schools, mostly in developed countries, offer courses in pedagogy and user education today. The data suggested dearth of teaching/training related courses in the LIS curricula. This might be attributed to the bureaucratic bottlenecks prevalent in educational systems, lack of capacity within LIS departments and lack of collaborative teaching culture in HE. The finding suggests the need for the integration of teaching/training- related courses in the curricula.

6.4.5 Marketing skills

The data indicated that marketing skills are considered important in LIS work environments. Sharma and Bhardwaj (2009:461) suggest that marketing competencies are integral in “understanding clients needs, building user loyalty and client base, plan service provision, publicizing the available information services, delivering efficient and effective information services, justifying funding requirements, and soliciting financial and other organizational support” (Sharma and Bhardwaj, 2009:461).

6.4.6 Financial management competencies

Skills in financial management are also highly emphasized by LIS employers. The Ahmedabad Library Network (2013) stated that in today’s LIS work environments, financial management issues are no longer limited to institutional account and financial realms. Library departments and projects have to prepare budgets, reconcile and review expenditure, solicit for funds, and manage their budgetary allocation. This might be the reason why financial management competences are being demanded in LIS work environments.

6.4.7 Entrepreneurial skills

The research data suggest that entrepreneurial skills have become very important in contemporary LIS work environments. This might be attributed to the techno-economic paradigm serving society today, and to resource scarcity common in most organizations. This scarcity requires a resourceful and enterprising labour force that is able to harness the available resources in inventive ways. In addition, the entrepreneurial skills embed in LIS curricula are enterprising skills critical to support information service delivery models that offset organizational inadequacies. Bathini (2013) concluded that entrepreneurship education equips information professionals with the requisite attitudes, skills and competencies needed to directly address issues of scarce resources and evolving work environments.

6.4.8 Need for strategic change management in LIS work environments

The emphasis on applied skills and diverse skill sets that transcend disciplinary boundaries bears testimony that the LIS work environments are experiencing difficulties in adapting services, practices, and roles that are transformed by ICT developments and changes in the wider society (Miller, 2007). Cleveland (2011) urges the LIS profession and its academic discipline to devise mechanisms to understand, study, analyze, predict and adapt to the changes in the profession. This suggests that the LIS field is in the midst of a paradigm shift and there is no point of reference to understand, inform and guide the change process. The finding suggests a perceived need for a model to inform the transition in the LIS field.

6.5 Extent of ICT integration in LIS curriculum

The fourth critical question of the study was: “What is the extent of ICT integration in the LIS curricula?” The findings revealed that the extent of ICT integration in LIS curriculum is very low. This was attributed to lack of adequate ICT infrastructure, equipment, capacity, policy and regulatory framework to support ICT integration in LIS curricula. This is consistent with past findings of Farrell, Isaacs and Trucano (2007). They conducted a survey of ICT and education in Africa and they found that the level of ICT integration in education is still ongoing and at an early stage. The low level of ICT integration was attributed to inadequacies in resources, both human and physical. The similarity of the findings might be attributed to the similar context and the survey and case study approach adopted in the studies.

6.5.1 Perceived need for ICT integration in LIS curricula

The data suggested that ICTs has gained preeminence in the LIS field, as information and service delivery and professional tasks have become dependent on ICTs. Mikre (2011) noted that the demand for ICT related competencies in LIS work environments are strong pointers of the need for ICT competencies in LIS graduates. This suggests a perceived need for ICT integration in the curricula. The finding shows that the drive to integrate ICTs in LIS education and training is noticeable but the LIS educational system is not ready for change. Knezek and Christensen (1999) attributed this to shortages of funding, capacity, ICT infrastructure and resources, policies and regulatory frameworks, lack of commitment, lack of vision and political will.

6.5.2 Existence of knowledge and skills

It emerged from the findings that LIS faculty and students lack the requisite ICT skills and competencies for ICT integration in LIS curricular to be meaningful. The finding corroborate Baylor and Ritchie (2002:398) who noted that, “regardless of the amount of technology and its sophistication, technology will not be used unless faculty members have the skills, knowledge and attitudes necessary to infuse it into the curriculum” Surry and Ely (2002) observed that for an innovation to be successfully implemented there is need for the requisite competencies to be available. The shortages of the related competencies obstruct or delay the adoption of the innovations (Rogers, 1995). Dick and Carey (1996) claimed that ICT integration in public educational sectors are challenged in terms of capacity, by lack of needs assessment (Boone, 1992), unobtainable objectives and weak goals (Brown, 2008), and poor self-efficacy (Ensminger, 2001). These assertions have great relevance to the situation in LIS education and training programmes. The data show that ICT initiatives in LIS education and training institutions are not informed by research or by needs analysis. There are no concrete objectives or policies on ICT integration in teaching and learning, LIS education and training, culture, norms, and established structures are not primed for change.

In addition Moelle and Reitzes (2011) maintain that teachers need to master ICT skills for them to use ICTs in education correctly. Wetzel (1993) reinforced this further when he asserts that even faculty who have prior technical knowledge about the innovation may not use the innovation, if they do not have knowledge on how to use it correctly. Expertise in ICTs among faculty raises confidence levels and builds positive attitudes towards use of ICT in

education. The DOI theory validated this assertion stating that potential adopters should have sufficient level of how-to-knowledge preceding trial of the innovation (Rogers, 1995). This type of knowledge equips the potential adopter with the proficiency required to use an innovation correctly and efficiently (Rogers, 1995). Contrary to the claims in the DOI theory that potential adopters should have the proficiency before adoption of the innovation, Molenda and Sullivan (2000:12) observed that the majority of faculty are expected to teach about and teach with ICTs without prior ICT competencies. This has negatively impacted on ICT integration in the LIS curricula. Lacking proper grounding in instructional technology, faculty tend to replicate what they were taught (Barron and Goldman, 1994). The major barriers in the integration of instructional technology in education sectors are therefore –deficiencies in upgrading the technology skills of existing teaching staff’ (Molenda and Sullivan, 2000:12).

The findings show that LIS students lack the requisite ICT skills and competencies vital for effective ICT integration in the LIS curriculum. Egan and Katz (2007); Minishi-Majanja (2009); Minishi-Majanja (2004); and Educational Testing Service (2006) observed that there is increased use of ICT in the wider society in communication, business, education and entertainment. However students lack the required ICT literacy for educational purposes. The Educational Testing Service (2006) confirmed this, stating that many students join higher and tertiary institutions without the requisite ICT competencies for effective learning. This has further frustrated ICT integration efforts in LIS education and training programmes.

6.5.3 Availability of ICT resources

The research data suggest that the available ICT resources in LIS education and training institutions are inadequate. Brown (2008) and Rosenberg (2007) emphasized that successful implementation of technological innovations requires supportive infrastructure. Rosenberg (2007) further contends that the state and level of a country’s e-readiness in terms of infrastructural and capacity development are important determinants of the adoption and use of ICT in its educational system. It is evident that change is situation-specific; therefore, the context in which ICT integration initiatives are proposed affects the extent of integration (Brown, 2008). According to the World Economic Forum (2013) Zimbabwe is not adequately prepared for ICT integration in education and training as a result of low levels of e-readiness, faculty capacity and deep rooted dogmas about ICT use in education.

Katz (2002) perceives ICT infrastructure as a ‘_driver of change’. The research data show that hardware, software, networks, capacity, technical support, funding, communication systems, and policy and regulatory frameworks are inadequate for ICT integration in LIS education. This suggests that the ICTs innovations required in LIS education and training surpass the available technological capacity of the country and of the institutions offering LIS education and training. Hall and Khan (2002) observed that without the requisite ICT facilitative conditions in place ICT integration in teaching and learning take longer to be implemented.

In addition, observations from the data suggest that the inadequacies in terms of ICT hardware, software, supplies, funding, and technical support, time and teaching materials suppress ICT integration initiatives in LIS education and training. Minishi-Majanja (2004) attributed the inadequacies to poor government policies, while Ensminger (2001) attributed it to concerns for returns on investments. Minishi-Majanja (2004) stated that computer and related items are often regarded as luxury goods and attract heavy import duties in Africa. In the same vein Ensminger (2001) asserts that most educational institutions have a concern for return on ICT investments. This concern has inhibited reasonable investments in ICT resources in HEIs. Opati (2013) found that shortages of ICT resources result in competition for the available resources, which in turn result in negative attitudes towards use of ICT in teaching and learning. He further emphasizes that inadequate ICT resources result in scramble for the resources among faculty or students, leading to friction and an unfavorable environment for teaching and learning.

The data suggest that resource scarcity in LIS education and training institutions does not always emanate from non availability or insufficiency of the available resources. Becta (2004) attributed the competition for the ICT resources to poor organization, distribution and management of the available resources. Minishi-Majanja (2004) and Tope (2012) point to poor scheduling and allocation of the ICT resources, downturns, unreliable power supply, poor quality hardware, inappropriate software and poor internet efficiency and connectivity. Ely (1993:56) argued that an ~~in~~novation that is not supported by resources such as hardware, software, money and personnel cannot take off let alone be successful”. Therefore, the available ICT resources in HEIs are incompatible with the existing needs and ICT integration is greatly undermined (Rogers, 1995).

6.5.4 Availability of time

The findings revealed that there is a ubiquitous time problem in LIS education and training programmes. The findings are similar to the results of the SARUA (2010) study which states that given the increased demand for higher education and rising student numbers, academic workloads have risen enormously leaving little time for faculty to carry on research obligations and other extracurricular activities. Ely (1999) and Rogers (1995) quantified time as company time, as well as personal time needed to acquire skills/knowledge, plan, adapt, reinvent, integrate and reflect on the innovation to suit their situation. Backhouse stated that “time management is a challenge that faculty face on daily basis. Time for planning, preparing course work materials, professional learning, record keeping, assessment, reporting, research, teaching and learning, collaboration with peers, scheming and extracurricular activities” (Backhouse, 2003:5). Backhouse (2003) and Al-Awani (2005) concurred that teachers are often unwilling to adopt innovations that are perceived to put extra demands on their time. This was also confirmed by Crosby, MacArthur and Wang’s (2003) study. They surveyed community college professors’ attitude towards online learning. It was revealed that the professors were reluctant to adopt online learning in their areas of specialty due to the extensive nature of the time and the effort required to design them. The DOI theory by Rogers (1995) also emphasizes time as a major variable in the diffusion process and in the “trialability” variable.

6.5.5 Rewards or incentives

The observations from the data reveal that the associated incentives for ICT integration in LIS curricula are very minimal. Research evidence has shown that incentives in terms of financial rewards, gifts, professional staff development opportunities, social praise, professional awards, achievement certificates/awards, bonuses, release time and recognition promote ICT assimilation in education (Ely, 1990b; Brown, 2008; and Anderson, Varnhagen and Campbell, 1998). This view is also supported by Dick and Carey (1990) who state that for any successful innovation transfer to take place, rewards and incentives should be provided to motivate and encourage implementation. The SARUA (2010) study noted that there are few incentives to support ICT integration in institutions of higher and tertiary education in the SADC region. The DOI theory by Rogers (1995) posits that incentives in the form of direct cash payments or kind increase the degree of relative advantage of the new idea and as a result speed up the rate of its adoption.

6.5.6 Key players and stakeholders participation in ICT integration

The findings also reveal that stakeholder's participation is a critical factor in ICT integration in the educational sector. The data further show that stakeholders' participation in ICT integration in LIS education and training programmes is limited. This was attributed to the top-down decision models prevalent in most LIS education and training programmes. Silliman, Sidney and Garnes (1998) emphasize that stakeholder's participation contribute meaningfully to educational innovations. LIS accreditation bodies, faculty, administrators, donors and private organizations, communities, parents, industry, policy makers and government need to be actively involved in ICT integration initiatives in LIS education and training programmes. Ely (1993) noted that all stakeholders should be active participants in the implementation process of an innovation. He argues that stakeholders should be involved in making decisions related to planning, design, reinvention, and use of the innovation as this instills a sense of ownership in all concerned parties. Brown (2008:23) postulates that key players and stakeholders should be actively involved in –shared decision making; mutual feedback; reciprocal encouragement; and vertical and horizontal communication. This takes place among all stakeholders and implementers involved, and when direct participation is not possible, the implementers should feel that their ideas are represented through a surrogate”.

6.5.7 Commitment to ICT integration in LIS education

The research data show that there is lack of commitment for ICT integration in the LIS curricula at both national and institutional levels. This was demonstrated by lack of a specific policy and regulatory framework on ICTs in education and lack of sustainable funding of ICT investments as well as capacity building (Isaacs, 2007). Brown (2008) suggested that leadership commitment is measured by the visible endorsement, ongoing support, sustainable funding and commitment to meet set targets of ICT integration projects. For ICT integration to be effective in LIS education and training, there is need for government, policy makers, institutional administrators, supervisors, leaders, and key stakeholders to be committed (Brown, 2008).

Likewise Opati (2013) confirmed that ICT initiatives in education cannot flourish in the absence of a cohesive national ICT policy. He opined that the policy should be comprehensive enough to coordinate the different ICT integration initiatives in the country and across institutions. Isaacs (2007) postulated that policy and regulatory frameworks on

ICT use in education provide specification guidelines. In addition it provides standard and frameworks for ICT integration in the curricula (Isaacs, 2007). Lack of specified ICT policy and regulatory frameworks in education and training prevents incorporation of ICT in the LIS curricula and teaching and learning. This might be a key reason why what is taught, and how it is taught is left to individual lecturer's discretion. This relates to ICT knowledge, competencies, subject pedagogy, teaching methods, available ICT resources and time (Haydn, 2009).

The data suggest that there is need for a major overhaul of the LIS education system. Weston and Bain (2010) stated that without an overhaul of the whole educational system, new innovations are implemented for traditional practices, while paradigmatic change in teaching, learning, and assessment methods associated with technology-rich environments are not in place. Moelle and Reitzes (2011) argued that unless new paradigms of teaching, learning and assessment are adopted and infused in education systems (compatible and supportive of ICT use in education); technological integration in education is not likely to succeed (Moelle and Reitzes, 2011). The finding suggests the need for major paradigm shift in LIS education and training learning models and assessments methods.

ICT integration attempts without ICT, human, financial, policy and regulatory infrastructure, leadership support and commitment, result in piece-meal type of changes posited in the Punctuated Equilibrium Theory as tuning and adaption. The theory puts forward that tuning and adaption does not yield the required transformative changes in LIS education and training as the changes are occurring within the framework of the existing paradigm of education which no longer provide answers to solve current issues. Therefore the attempts to reform tend to be bound by the existing paradigm (Nadler and Tushman, 1995). Arguably, what is required is to invigorate LIS education and training through reorientations and re-creations. –Reorientations involve redefinition of the organizational strategies, power, structure and systems towards a new basis of alignment” (Tushman and Romanelli, 1985:173) while recreations entail simultaneous change of the organization's basic tenets and destruction of some elements of the old system (Nadler and Tushman, 1995). These assertions point to the need for major transformations in LIS education and training systems.

6.5.8 Leadership

The findings also revealed that visionary, committed and competent leadership is a critical resource in LIS education. Fullan (2002:11) defines leadership as “the capacity to engage in solving a complex problem”. In educational settings, leadership consist of ministers of educational ministries, policy makers, chairpersons of department, deans/heads of departments/schools, and institutional experts in ICT, early adopters of ICT and opinion leaders (Ehrmann, 2001). Effective leadership is therefore important in LIS education and training as they allocate resources, endorse projects, plan, and lead, organize and motivate others (Ely, 1999). In addition Brown (2008) reiterated that leader’s ensure that training is available for policy implementers, offer encouragement and shared enthusiasm. However, political partisanship, corruption, mismanagement and incompetence have negatively affected the quality of leadership in institutions offering LIS education and training. Fullan (2002) advises that “leaders will increase their effectiveness if they continually work on the five components of leadership...pursue moral purpose, understand the change process, develop relationships, foster knowledge building, and strive for coherence”.

6.5.9 Context of ICT integration

Additionally, without taking cognizance of the context and available ICT resources, ICT integration initiatives in LIS curricula are tantamount to an “adds on” ethos which does not revitalize LIS education and training. Richards (2005) confirms this, declaring that ICT integration in education without the facilitative antecedents in place results in “add on” activities that are unlikely to revitalize HE systems, paradigms, resources, and capacity, goals, visions and teaching and learning models. This assertion is reinforced by Rosenberg’s (2007) assertion that initial conceptualization of an invention needs the appropriate supportive infrastructure, technical capabilities and skills to make it viable.

6.6 Human and physical resources for delivering LIS education

The fifth critical question of the study is “What human and physical resources are available for delivering LIS curriculum?” The findings revealed that the human and physical resources available are inadequate for delivering LIS curricula. These resources were underlined as: skilled human capital, ICT infrastructure and connectivity, physical infrastructure, national and regional policy frameworks, equipment, financial resources, information resources, time, practicum placements, up to date curricula and quality cohort of students. The findings

corroborated the Punctuated Equilibrium Theory's inferences that an organization's continued successes are a function of its internal and external unique competitive resources (Tushman and Romanelli, 1985). The findings presented here were relatively similar to the study of Minishi-Majanja (2004) in some respects. The relative similarity of the findings may be attributed to the targeted population (LIS schools)-common in both studies, the context of the studies (Sub-Saharan Africa and Zimbabwe) which is relatively similar, and the methodology and methods used for data production.

6.6 .1 Skilled human capital

The research data reveal that skilled human capital is an integral resource for delivering LIS curricula. Bhasin (2012) point out that the effectiveness and utility of LIS education programmes largely depend on the expertise of the teaching staff and their availability. He reiterated that the most vital resource for any industry is its human capital and the most desirable attributes are their competencies, skills, experiences, attitudes and knowledge. The World Bank (1994) further noted that high quality and well motivated teaching faculty and a supportive professional culture are vital in building excellence. The findings suggest that the available human resources in LIS education and training programmes are inadequately capacitated for the effective delivery of the LIS curricula. This is due to limited continuous professional development opportunities and limited collaborative linkages with the practitioners.

The SARUA (2010) study reported that universities in Zimbabwe were understaffed as a result of brain drain. These institutions are unable to attract highly qualified and experienced faculty because of poor working conditions, lack of robust research and low remuneration. Another SARUA (2008) study corroborated the findings and emphasized that academic remuneration in most SADC universities is poor, and working conditions are not conducive for research. Many highly qualified and experienced academics were forced to leave the country for greener pastures. The skills inadequacies and unavailability has negatively impacted on LIS education in terms of quality, quantity, community engagement, and research output. The finding corroborates the Punctuated Equilibrium Theory claims that human resource scarcity results in organization failure to meet set goals (Tushman and Romanelli, 1985).

In addition, there is anecdotal evidence in the findings that LIS education and training programmes provide limited opportunities for staff development. However, the data suggested that there is no guarantee that employees sent overseas for staff development fulfill their obligation to serve the organizations after completion of their studies. Chestanga (2010) postulates that staff sent overseas on staff development do not fulfill their contractual agreement. Most often they breach the contract and get jobs in other organizations that are able to offer them higher remuneration, better working conditions and research opportunities. These issues compound further brain drain and skills scarcity (Ikoja-Odongo, 2006). Accordingly, Chestanga (2010:52) bemoans this state of affairs noting, “... these manpower losses were very unfortunate because these universities had earlier invested considerable financial resources in the staff training. Addressing the existing staff shortages is going to require either more funding spent on training new lecturers or finding ways of attracting former lecturers who have been lost to the Diaspora”.

6.6.2 ICT infrastructure and connectivity

The data reveal that reliable and efficient ICT infrastructure is a critical resource in delivering LIS curricula. The data further suggested that building a robust ICT infrastructure is not prioritized at both national and institutional levels. This phenomenon is not unique to the Zimbabwean context but is a common trend in Africa. Adams (2003) states that most HEIs have been experiencing major budget deficits and cannot afford to invest in the requisite physical and ICT infrastructure. He points out that ICT initiatives in many HEIs were not on high priority areas and hence are often relegated to the tail-end of the institutional budget list. Furthermore Adams (2003) attributes the poor ICT infrastructure in HEIs in Africa to the exorbitant initial costs required to put ICT infrastructure in place. He further argued that it is for this reason that many HEIs in Africa have inadequate ICT infrastructure and are dependent on donor ICT initiatives.

Adams' (2003) assertions have been exemplified in Zimbabwe where there is a decline in government funding in HEIs. This has prompted HEIs to seek alternative means of funding for survival. Many of them have resorted to donor communities for support (Isaacs, 2007). A number of the ICT infrastructure development projects have been instigated by donor organizations. Donor organizations such as World Link, Kubatana Trust of Zimbabwe,

College IT Enhancement Programme (CITEP), The African Virtual University (AVU), The African Development Bank (AfDB), NORAD, Rockefeller Foundation, the Ford Foundation, Bill and Melinda Gates Foundation, are visible funding agencies (Isaacs, 2007).

However, due to prevailing political conditions and imposed sanctions in the country most donors have withdrawn funding in protest at the human rights abuse by the current government (SARUA, 2010). The donor community has adopted “wait and see” attitude and this has severely repressed ICT infrastructure development in HEIs. Accordingly, this has left many HEIs with few options. They have to develop their ICT infrastructure through “piecemeal add-on approaches” (Adams, 2003). These attempts, although laudable, do not meet the ICT needs and demands of the HEIs and models of education currently advocated in HE globally (Adams, 2003). This corroborated the Punctuated Equilibrium Theory inferences that organizations have resources that drive their actions and the resources are integral to the organization’s success (Tushman and Romanelli, 1985).

The observations in the data also suggest that internet connectivity is a critical resource in delivering LIS education. SARUA (2010) stated that reliable and affordable internet connectivity is a necessity for revitalization of higher education teaching, learning and research. SARUA (2012) noted that connectivity problems in the SADC region have been resolved by the installation of the fiber-optic submarine infrastructure as of 2010. However, investments in creating high-speed connectivity between institutions and the international cables, in campus-based broadband infrastructure, is greatly needed (SARUA, 2012).

Additionally, the SARUA (2012) report also noted that investment in campus fixed or wireless broadband was inadequate in HEIs. The report further claimed that wireless access can liberate access to knowledge, liberate students from the confines of computer laboratories and classroom learning and leverage e-learning practices. Isaacs (2007) and Adams (2003) concur that internet connectivity is dependent on the availability, reliability and affordability of electricity. The irregularity of public power supply means that ICT facilities cannot be used for instruction whenever there is a power failure (SARUA, 2012).

6.6.3 Physical infrastructure

The research data suggest that well maintained facilities and an environment free of political interferences were crucial for delivering LIS curricula. Equally important are learning facilities such as classrooms, furniture, and office space and study areas. McKimm (2007) also found that teaching rooms, office space, social and study space to allow students to spend time outside the lecture rooms should be enough. He further notes that sufficient space and an enabling environment to work in and meet with students should be provided. A study by SARUA (2010) found that in Zimbabwe the physical facilities such as lecture halls, classrooms, laboratories, administrative offices, libraries, staff and student accommodation, offices, study areas, and sporting facilities were either in short supply or aged and in a state of decay. This was attributed to lack of funds to refurbish and retrofit the facilities. There is also lack of funds to initiate, complete and expand construction projects in most universities. SARUA (2010) reported that most universities (with the exception of the University of Zimbabwe) in Zimbabwe have been established in the past 15 to 10 years and the significant components of their physical infrastructure are yet to be built. The report further states that completion; expansion, refurbishment and retrofitting of the physical infrastructure in HEIs are beyond the reach of the cash-strapped Zimbabwe government. Without these physical infrastructures investment's quality assurance goals for higher and tertiary education institutions are likely to remain elusive.

6.6.4 National and regional policy frameworks in education

The research data also indicate that policy frameworks at both national and institutional levels are important for delivering LIS curricula. The finding is based on the premise that educational systems are depended on national and regional policy settings and, regulatory frameworks by government and regional bodies for their operations. The policy and regulatory frameworks are key determinants of how the educational system operates, what can be done and not be done as well as control the changes that take place (Isaacs, 2007 and Adams, 2003). SARUA (2008) reported that the policy and regulatory frameworks that monitor and regulate HE in Zimbabwe are in place. The Zimbabwe Council for Education Act of 2006 regulates HE. Its major function is to control, monitor, provide a frame of reference for accreditation, and regulates quality assurance (SARUA, 2008). The statutory bodies that monitor and regulate the provision of higher and tertiary education in Zimbabwe include the following: the Zimbabwe Council for Higher Education (ZIMCHE), the National

Manpower Advisory Council (NAMACO), the Zimbabwe Manpower Development Fund (ZIMDEF), the College Lecturer Association of Zimbabwe (COLAZ), the National Economic Consultative Forum and the Zimbabwe Occupational Standards Service (ZOSS) (SARUA, 2012). These bodies address diverse issues ranging from quality assurance, training and research needs, representation of faculty and occupational standards compliance (SARUA, 2012).

Regionally, there are diverse regional policy frameworks in place to guide higher education in SADC and these include the SADC Protocol on Education and Training, the Regional Indicative Strategic Development plan, and the SADC Quality Assurance Framework (SARUA, 2008). However, the SADC Protocol on Education and Training is rather antiquated and lacks practical implementation details in the contemporary higher education environment (Butcher et.al, 2008). Both the national and regional policies and regulatory frameworks inform LIS education and training on a broader standpoint. The research data points to a dearth of specific policies and regulatory bodies responsible for monitoring and holistically regulating LIS education and training and this links with Tushman and Romanelli (1985) who conclude that obligation or lack of it limits organizational change.

6.6.5 Equipment

Equipment such as overhead projectors, printers, microphones, television, videos, power point projectors, laptops and relevant software are essential in delivering LIS curricula. Empirical research findings by Rosenberg (2000) found that there is a general lack of teaching and learning equipment in HE in Africa. The SARUA (2010) study confirmed that HEIs lack access to basic resource essential for teaching and learning. The SARUA report also noted that the available ICT infrastructure, hardware and software and other instructional technology in HEIs are antiquated. Most of them were refurbished gifts/donations that are out-dated and no longer compatible with contemporary operation systems, softwares, available services, parts, and teaching needs.

Furthermore, it has been observed from the results that LIS schools have inadequate dedicated ICT laboratories and computers to support LIS curricula delivery. According to Minishi-Majanja (2004), 62% of LIS schools in Sub-Saharan Africa do not have

departmental ICT laboratories and the centralized laboratories are badly administered, insufficient, inadequately resourced, and lack maintenance. She further states that the inadequacies have forced students and faculty to scramble for the few available facilities, resulting in unfavourable conditions for teaching and learning. The SARUA (2010) study authenticated Minishi-Majanja (2004): according to this study the current lecturer/computer ratio in Zimbabwe universities is 8:1 and the student computer ratio is above 10:1. The overwhelming faculty and student computer ratio constrain teaching, learning and research (SARUA, 2010).

6.6.6 Financial resources

Financial resources are critical in the delivery of LIS curricula. SARUA (2010) confirmed that financial resources in HEIs are insufficient to sustain teaching, learning, research, infrastructural investments, human capital development and for effective operations. Minishi-Majanja (2004) observed that the rapid pace and transient nature of ICT requires sustained funding. OECD (2007d) reported a trend towards moving away from public to private sources of funding in HEIs. The OECD study identified that 24% of expenditure on HE across OECD countries came from private sources. However in the SADC region, the largest percentage of HE funding is from public funding (government subsidies and students tuition fees) (SARUA, 2011). Pillay (2008) observed that the problem of inadequate and declining financial resources in HE is, in most cases, compounded by inefficient and inappropriate use of available financial resources by HEIs administrators. This assertion has been observed at the Zimbabwe Open University where close to US\$600 000 was misappropriated on gratuities, while part-time lecturers, module writers, examination markers and other service providers had not been paid for years” (Moyo, 2014: J-5). These acts of corruption, although publicized by the media, went unpunished as a result of political protectionism. Accordingly Uzodike (2009:4) argues that —... many African governments have remained either criminally blind to, or unable to redress ... this financial violence [and it] typically goes unhampered and unpunished”. Therefore committed, honest, politically tolerant, visionary, innovative leadership that is well trained, experienced, highly competent and able to run educational institutions professionally has become indispensable for delivering LIS curricula. Based on the insights from the Punctuated Equilibrium Theory, Mayasari (2010) emphasized that reforms in HE must be a collaborative effort among all the stakeholders.

6.6.7 Information resources

Adequate and current information resources are critical for teaching LIS curricula. However, information resources are in short supply; outdated and full access to digital resources is limited due to lack of funding. This may be attributed to budgetary constraints experienced in HEIs. Rosenberg (2007) has noted that there is a general lack of teaching and learning materials in Africa. Rosenberg attributed the lack of indigenous information resources to low research output by faculty and Bozimo (1985) has argued that this has led LIS academics to depend heavily on foreign published resources for teaching and learning and for research. He cautioned that until LIS faculty actively participates in the generation of information resources locally the problem will remain endemic.

SARUA (2010) reported that teaching and learning capacity in HEIs is further eroded by inadequate library resources, lack of full access to digital resources and lack of robust institutional repositories. The report further stated that currently the student and information resource ratio at Midlands State University is 20:1 as opposed to a desired ratio of 3:1. However, this state of affairs is prevalent in almost all HEIs. According to the perspectives of the Punctuated Equilibrium Theory, this situation is undesirable and organizations must strive to have a free flow of information relevant to its goals, strategy, and competitive timing from its environments and within the organization (Tushman and Romanelli, 19985). Furthermore, the theory claims that the organization need to promote ownership and entrepreneurship of the information flow (Gersick, 1991).

6.6.8 Time as a resource

Time constitutes a major resource for teaching LIS curricula. The LIS faculty and administrators need time to conceptualize the changes in the profession, to plan and invest in the requisite resources, to realign with the changes in terms of re-skilling of faculty and curricula reorientations, to advocate for change to accreditation bodies, policy makers, government and stake holders, to experiment with the new innovations and to research about the new innovations to inform practice. The Punctuated Equilibrium Theory claims that when managers are faced with an imminent need to change, they are relatively constrained in terms of time in what they can do and there will be less time for planning, insufficient time to

involve many people, little time to experiment, inadequate opportunities to influence shifts in principles, culture, practices, and strategy (Romanelli and Tushman, 1994).

6.6.9 Practicum or internship placements

Students' industrial placements are regarded as a critical resource in delivering LIS. However, the internship placements have become scarce as libraries and industries close due to the prevalent socio-economic and political problems in the country. Galvin (1995) states that there is limited quality in practicum placements available in LIS work environments because good internship is costly to provide. This supports the Punctuated Equilibrium Theory inferences that organizations are not self sustaining as they exchange resources with their environments for survival (Tushman and Romanelli, 19985).

6.6.10 Up to date curricular

A relevant curriculum is regarded as an important resource for delivering LIS education. The data indicates that LIS curricula are out-dated and LIS departments lack adequate funding to review their curricula. However, the stringent bureaucratic processes involved in curricula reviews or reforms have further compounded the problem. Virkus (2012) suggested that the curriculum is the best measure to reflect the changes, trends and challenges taking place in the profession and its educational programme. In this regards, Lawal (2000) advocated for continuous reviews of LIS curricula to reflect and align with the changes, challenges, needs, employment market, contemporary professional thoughts, manpower forecast and the trends of research interests of the profession. Tushman and Romanelli (1985:177) posits that organizational obligations limit change: ~~even~~ if a system can overcome its own cognitive and motivational barriers against realizing a need for change, the networks of interdependent resource relationships and value commitments generated by its structure will often prevent it being able to achieve the required change".

6.6.11 Quality cohort of students

The findings revealed that quality student cohorts are essential for the delivering of LIS curricula. However, it was observed that although LIS departments expect to attract quality students in their programmes, they ~~more~~ often than not, have to be contented with the left overs', or the cross' who have failed to secure admission in the areas of their first or second

choices” (Lallo, 2013:32). Singh and Wejetunge (2006) and Issa and Nwalo (2008) reiterated this concern, further stating that most students who gain admission in LIS education programmes do so as a last resort, having failed to secure admission to their preferred disciplines. Nevertheless, Lallo (2013:32) observed that only a ~~tiny~~ minority of students with excellent entry qualifications that might have gained them admission in any department of their choice opted for LIS Schools as their first choice. He further noted that these students do so out of curiosity or adventure associated with treading unfamiliar paths, and it is this group of student that is the saving grace of these departments”. Alabi (2004) contends that the most important asset in every form of higher education is the faculty and students, and that if quality people are not put at the heart of education, the process is bound to fail. Based on the Punctuated Equilibrium Theory, Mayasari (2010) notes that when an organization face challenges such as competing resources, legitimacy and winning consumer hearts it has to change radically in its focus and way of thinking: if not, it is threatened with extinction.

6.7 LIS faculty awareness about paradigm shifts in the information industry

The sixth critical question of the study was, “What is the level of awareness by LIS faculty regarding paradigm shifts in the information industry?” The research findings revealed that LIS faculty have a higher level of awareness and perceived knowledge of the paradigm shifts the information industry. However a relatively small minority had negative attitudes towards the shifts. This was attributed to individual personal dispositions, values and dogmas. A relatively similar study in India (Prakash, 2009) which investigated the causes of resistance of LIS employees towards change, found relatively similar findings with those of the present study. The similarities were based on the in-depth interview techniques employed in both studies in the data production process, and the relatively similar population.

6.7.1 Awareness of paradigm shifts in the information industry

The research findings revealed high levels of awareness of paradigm shifts among LIS faculty. The high levels of awareness-knowledge of the paradigm shifts in the information industry were attributed to the effectiveness of the established communication channels in the LIS field in the form of conferences, workshops, published literature, exchange programmes, corroboration efforts and the internet. In addition the data suggest that the LIS community is highly interconnected and information can be easily transmitted to its members. Furthermore the interconnectedness of the LIS field suggests that they have established norms and a

culture of sharing information. Rogers (1995) DOI theory claims that the diffusion process takes place within a social system and the members of the social system share information or knowledge about the new innovation through their communication channel. However, Moseley (2004) and Rogers (2004) noted that the communication channels of social systems have been revolutionized by advanced development in ICTs. They further noted that the ubiquitous nature of digital social communication channels have brought many kinds of social change such as change through social dialogue, civic participation, agenda setting and media effects.

6.8 LIS faculty attitudes towards paradigm shifts

The last critical question of the study was, —What are the attitudes of LIS academics towards the changes in the information industry?” The research data confirmed that 93% of LIS faculties have optimistic attitudes towards paradigms shifts in the information industry while the minority (7%) has pessimistic attitudes towards the shifts. The differences emerging from the findings reinforce the debate on paradigm shifts in literature. There are two opposite thoughts about paradigm shift in LIS education and training: pessimistic and the optimistic.

The pessimistic group implies that information science has taken over library education, and in so doing, has relegated the core principles of the profession to the archives (Dillon and Norris, 2005; Gorman, 2000). Prakash (2009) attributed the negative attitudes to individual temperament, paradigm effect, and paradigm paralysis”. While the optimistic group hailed the changes taking place in the profession as they felt that it has given LIS professionals unlimited horizons to career opportunities, teaching, research and has uplifted the image of the profession (Apostle and Raymond, 1987; Hazeri, Martin and Sarrafzadeh, 2009). The findings suggest that the attitudes towards an innovation might be attributed to individual personal dispositions: individual innovativeness, and level of education, experience, and self-efficacy. The finding is in agreement with Prakash’s (2009:373) assertion that —for some change is embraced enthusiastically; others are more cautious-responding to change by seeking to test and examine change before preceding; and while for others, change threatens their established values and understanding and therefore change is deeply unsettling and change is something to be resisted”.

The categorization of LIS scholars and faculty into optimistic and pessimistic groupings is relatively similar to the DOI adopter's categories which groups adopters into five categories: innovator, early adopter, early majority, late majority, and laggards (Rogers, 1995). The DOI theory claim that the five personal characteristics of adopters affect their perceptions of innovations, decisions regarding adoption, attitudes towards innovations, rate of adoption, and individual innovativeness (Rogers, 1995).

The research data attributed the negative attitudes to the changes in the LIS profession to factors such as the transitory nature of the changes, inadequate resources, incapacity, lack of incentives, lack of management support and deep rooted dogmas. The transitory nature of the changes in the LIS profession renders individual or group change strategies ineffective and this usually incites negative attitudes. Prakash (2009) argues that the external and internal changes taking place in the profession are highly ephemeral and thus create a lag in understanding, appreciation, coping strategies, and acceptance of change, hence, resistance to change. Based upon the DOI Theory, the transient nature of the changes in the LIS profession that is due to advanced development in ICTs, may be equated with innovations fads that are described "as innovations that represent a relatively unimportant aspect of culture, which diffuses very rapidly, and then is rapidly discontinued" (Rogers, 1991:214). The transient nature of the changes in the LIS profession might be attributed to the negative attitudes among faculty.

Furthermore, the findings have shown that there are inadequate resources (see section 6.3.5) in terms of skilled human capital, ICT infrastructure and connectivity, physical infrastructure, policy and regulatory frameworks, time for example, to support change. Prakash (2009) noted that insufficient resources negatively impact on employees' attitudes towards the change process. Inadequate resources are a contributory factor in the negative attitudes among faculty towards paradigm shifts in the information industry. The finding is in agreement with the DOI Theory which posits that resource scarcity (hardware and software) negatively impact on organizational change. Therefore sufficient resources are significant factors in the diffusion of innovation in LIS education and training.

The research data suggested that LIS education and training programmes have adopted new innovations. The data further suggest that some of the LIS faculty have under developed ICT proficiency. Therefore underdeveloped ICT competencies among faculty might be the reason

why some have negative attitudes about the innovations. This has been demonstrated in LIS education and training programmes where LIS faculties are expected to teach new information and ICT related courses without well developed ICT competencies and skills. This has resulted in resistance reflected in the unconstructive approach to what is taught in these modules. How it is taught is left to individual lecturer's discretion in terms of ICT knowledge and competencies, subject pedagogy, availability of ICT resources and time. This view is also shared by Moelle and Reitzes (2011) who argued that without the development of the prerequisite capacity faculty, confidence level is lowered and results in negative attitudes towards the changes and subsequently to resistance.

Additionally, the findings suggest that innovation incentives in LIS education and training are low. Lack of incentives both in kind and financial support are a contributory factors in negative attitudes towards change (Prakash, 2009). Prakash further noted that when internal or external incentives are not comparable with counterparts in the private sector or region, change may be resisted. Rogers (1991) posited that offering incentives is a major strategy that affects the perceived relative advantage of innovations and influence its adoption rate among a social system.

More so, the negative attitudes towards paradigm shift in LIS education may be attributed to lack of management support and commitment to change in LIS education and training. The finding is corroborated by Brown (2008:24) when he observed that "lack of leadership support and commitment has resulted in poor planning, lack of funding, and communication of change projects, failure to identify and involve key stakeholders, failure to adopt the philosophy, goals and needs of the organization and resulting in negative attitudes towards change". This view is also supported by Surray and Ely (2002) who claimed that without management acknowledgement and appreciation of change, employees tend to resist change.

Furthermore the research findings support the assertion that LIS education and training as community of practice have deep rooted paradigms, culture and norms that might act as inhibiting factors among LIS faculty to embrace change. Prasher (2009) has postulated that deep rooted dogmas and technophobia are significant factors of resistance to change among LIS employees. In an earlier study, Rogers (1991) claims that innovations that fall outside the boundaries of a social systems' embedded culture, values, norms, and prior experiences can be resisted. Rogers also posits that "old ideas are the mental tools that individual utilize to

assess new ideas and individuals cannot deal with change except on the basis of what is known” (Rogers, 1995:225-226).

6.9 Broader issues in HE

The data suggest major transformations in the HE sectors characterized in the Punctuated Equilibrium Theory. However, instead of adopting radical changes such as reorientations and recreations, HE by nature of its culture and resource inadequacies seems to be responding to the changes incrementally (tuning and adoptions). This does not bring about the anticipated radical changes needed to revitalize the educational system in the country. Tushman and O'Reilly (1996) claim that organizations that try to adapt radical changes by making incremental change are unlikely to succeed. The adopted type of change according to Nadler and Tushman (1995) affects the focus for change efforts, the sequence of steps in the change process and the locus for change in the educational system. Therefore, the locus of change in HEIs is situated in an environment already stifled with the following challenges:

- scarcity of skilled human capital,
- brain drain,
- declining government funding,
- poor governance and leadership,
- insufficient and deteriorating infrastructures,
- skills mismatch,
- irrelevant and dated curricula,
- dated and generalized policy frameworks,
- inflexible policy and regulatory frameworks,
- questionable relevance and quality of teaching, and
- learning and research capacity,

These inadequacies suggest lack of facilitative conditions to support the changes in HE. This suggests that deep-seated changes in HEIs remain repressed due to the prevailing inadequacies. As Mayasari (2010) notes, the magnitude and success of educational reforms are deeply rooted in available resources. Available resources determine the extent of change in the educational systems and it is for this reason that this study suggest that HEIs and policy makers should capacitate for the changes in HE.

6.10 Summary of research findings

The research findings seem to suggest that the goals of LIS education and training have diversified to include new goals and visions. This is characteristic of transforming organizations in which new goals, visions and missions are strategically devised to repositioning the organization in new environments and markets.

LIS education and training is offered in dual sectors: university and TVET. The learning models in LIS education and training include: conventional, parallel, block release and distance and open learning. The qualifications of LIS education programmes falls within three levels (1) sub-baccalaureate (NC, ND and HND) (2) baccalaureate degrees (3) post graduate (diploma, master and doctoral degrees). However, LIS educational programmes in Zimbabwe are undergraduate teaching-focused and therefore their major focus is on teaching rather than research.

LIS education programmes have retained the nomenclature “LIS department/school” and either exists as independent stand-alone departments or affiliated under the Faculty of Communication and Information Science or Applied Social Sciences. The competencies encapsulated in LIS curricula signify that LIS education and training programmes are in the midst of radical social change. The competencies encapsulated in the curricula reveal transformative changes aligned to advanced development in ICTs, adoption of the information paradigm, user-centered, and entrepreneurial paradigms. However, the results also show that although LIS education and training programmes have adopted ICT innovations and broadened their focus beyond traditional libraries, they have managed to retain their hold on the traditional tenets of the LIS profession.

LIS work environments are demanding applied competencies and skills for information service delivery. Traditional LIS technical skills have lost their preeminence in the LIS labour market and ICT, information, IPR and generic and transferable skills are highly valued. The extent of ICT integration is very low due to lack of resources, political and leadership commitment.

Faculty awareness of the paradigm shift in the information industry is very high and this is attributed to the omnipresent nature of the contemporary digital communication channels.

The majority of faculty have positive attitudes towards the shifts while an insignificant minority harbor negative attitudes and this may be attributed to lack of capacity or underdeveloped competencies, poor leadership, and lack of leadership commitment, inadequate resources, and incentives as well as the transitory nature of the changes.

CHAPTER SEVEN

SUMMARY OF FINDINGS AND CONCLUSIONS

7.1 Introduction

The purpose of this chapter is to provide a synthesized synopsis of the overall research study, reaffirming the research problem, justifying the methodologies used, providing answers to the major research problem and the six key questions guiding the study. The findings of the study presented and discussed in chapters five and six respectively are summarized, bringing together the main conclusions drawn within the context of the findings, integrative theoretical framework, literature and practice. The study's contributions to theory and practice are discussed and suggestions for further research outlined. The chapter concludes by highlighting possible areas of action.

This chapter is divided into seven sections: 7.2 research purpose; 7.3 summary of the study; 7.4 summary of the findings; 7.5 research contribution to the body of knowledge; 7.6 future research directions; and 7.7 recommendations for further action.

7.2 Research purpose and research questions

The aim of the study was to explore why LIS education programmes in Zimbabwe are criticized for churning out graduates who are not “industry ready”. The study assessed LIS education and training in Zimbabwe in the context of paradigm shift in the information industry and how the indicators of change, mostly at the global level, reflect the interplay of these factors in Zimbabwe. Although diverse studies on LIS education and training in the context of paradigm shifts have been done (as described in chapter 3), the question of why LIS education programmes are reproached for churning out LIS graduates without the requisite skills to perform right away in their first jobs has not been clearly answered. Furthermore, previous studies on LIS education focus on other countries while minimal research has been done in the Zimbabwean context.

The study sought to address the following research questions:

1. What are the goals of LIS education and training in Zimbabwe?
2. What competencies are encapsulated in LIS curriculum?
3. What LIS skills are needed by the information industry?
4. What is the extent of ICT integration in the LIS curriculum?
5. What human and physical resources are available for delivering LIS curriculum?
6. What is the level of awareness by LIS faculty regarding paradigm shifts in the information industry?
7. What are the attitudes of LIS academics towards the changes in the information industry?

7.3 Summary of the study

This section provides a short synopsis of the methodological and theoretical approach used in this study. The study was informed by the post positivist paradigm (described in chapter 4) where combined qualitative and quantitative methodologies were used to inform the research design and the data collection. The qualitative perspective was dominant, complemented by the quantitative. A combination of case study and survey research designs was used. Respondents were surveyed using questionnaires and in-depth interviews. The document review method was also used to collect data from LIS curricula.

The case study design was found appropriate because LIS academic departments are –service organizations involving social realities. These were places rich in meaning created by the individuals who work in the environment and in which groups and individual behavior constitute an important factor” (Gorman and Clayton, 2005:16). The case study design therefore represented a viable means to collect data to address the research problem from those who have lived experiences in LIS education and training. Furthermore, in-depth interviews, survey questionnaires, and documentary research techniques provided an opportunity to collect individual or group insights and salient issues in LIS education and training. This allowed the researcher to have comprehensive, quality, trustworthy and context specific data on LIS education and training.

The purposive sampling method was used to select respondents for the study. The purposive sampling method represented a viable means to get insights of knowledgeable and experienced individuals with genuine interests in LIS education and training issues.

According to Merriam ~~where~~ sampling has been conducted purposefully from knowledgeable individuals noteworthy, appropriate, and dependable data is produced” (2001:63). The field study that was conducted involved interviewing 5 deans/HODS and 17 LIS employers across 17 institutions. 155 survey questionnaires (47 LIS academics and 108 final year students) were distributed and 71% were completed and returned. Qualitative data were analyzed using NVivo version 10 while quantitative data were analyzed using SPSS version 20.

The study blended two change theories namely DOI Theory by Rogers (1995) and Punctuated Equilibrium Theory by Tushman and Romanelli (1985) (described in chapter 2). DOI and Punctuated Equilibrium Theories have been used independently or in combination with other theories to investigate change issues in LIS education. The researcher failed to retrieve other studies in LIS education that have used a combination DOI and the Punctuated Equilibrium Theory in a single study. The combination of these theories in a single study is therefore a (major) breakthrough as it provides baseline data on the applicability and effectiveness of the integrative theoretical framework to understand, describe, predict and provide a systematic research procedure for research studies in LIS education and training. The the integration of the two theories in this study was meant to increase credibility and effectiveness of the two theories as analytical lens to inform the study.

The findings of the study suggest that the purpose of LIS education and training programmes is not to produce industry ready graduates but to equip them with abroad educational backgrounds applicable in diverse information related environments. The goals of LIS education and training are teaching and learning, research, community service/engagement, stimulating use and research about ICT and stimulating entrepreneurial culture. The transitory nature of change in the LIS field has brought a disjuncture between what is taught in LIS education programmes and what is expected in LIS work environments. This has alienated LIS education from its principal mission of professional scholarship and training and from its major function of producing adequately prepared skilled personnel for the industry and the profession. The findings attributed this gap to inadequate resources; lack of policy and regulatory frameworks; lack of leadership commitment and political will; LIS faculty’s lack of prior experience as practitioners; uncertainty and lack of capacity among faculty. The interplay of indicators of change at global level was also noticeable. The indicators of change

were characterized by preeminence of information related concepts and courses in LIS curricula, changing goals, expanding core competencies, changing skill sets, evolving roles, ICT integration in LIS curricula, transient LIS work environments, uncertainty and the presence of inter/multi/transdisciplinary competencies. These indicators of change are reflective of deep revolutionary transformations taking place in the LIS field that are permanent.

7.4 Summary of the findings

The sections that follow provide a comprehensive summary of the findings based on the six research questions guiding the study, theoretical framework and literature that have been discussed in chapters 1-3 respectively.

7.4.1 Goals of LIS education and training

The first research question sought to determine the goals of LIS education and training in Zimbabwe. The findings indicated that the goals of LIS education and training in Zimbabwe are teaching/ learning, research, community service, and stimulating entrepreneurial culture. These five goals represent the existing deep structure (underlying order) of LIS education and training in Zimbabwe. However, the first three goals; teaching and learning, research, and community service, summarize the primary focus of LIS education and training globally.

Moreover, the study confirmed that teaching and learning was found to be heavily emphasized in LIS education and training to the detriment of the other goals. This finding suggests that teaching and learning is the fundamental choice in which the basic patterns of LIS education system's units are organized. Teaching and learning, therefore, represent the basic, highly durable underlying order of LIS education programmes. The underlying order controls and rules out alternatives outside the teaching and learning boundaries in LIS education and training. This might be the reason why other goals such as research and community service are neglected. Gersick (1991:16) asserts that a ~~system~~ system's deep structure is highly stable, and the trails of choices made by a system rules many options out at the same time as it rules mutual contingent options in". This suggests that community service and research have been ruled out by teaching and learning in LIS education. Therefore there is a

perceived need to reinvigorate research and community engagement as functions of LIS education.

In addition the research data suggest that LIS education programmes provide a general education adaptable in diverse information environments. This implies that LIS education underlying order does not focus on producing industry ready LIS graduates. This may be the reason of the disjuncture between what is offered and what is required. Furthermore, this suggests a shift in the perceived purpose of LIS education and training. The data suggest that LIS education has shifted its perceived purpose of training for library institutions to training for an evolving broader information environment. This makes it difficult to predict the competencies required in the next five years. Therefore, the transitory nature of the information environment might be another reason why LIS education and training programmes are purportedly reproached for inadequately preparing LIS graduate. Moreover, the shift in perceived purpose demands major investments in faculty capacity and resources in LIS education and training. In addition, the shift also demands development of creative, well envisioned and adaptable educational programmes and curricula. Therefore, lack of capacity, up to date resources and envisioned and adaptable educational programmes might be the reason why LIS graduates are inadequately prepared for their future roles.

The other two goals, stimulating use of and research about ICT and developing entrepreneurial culture suggest major revolutionary changes in the structure, strategies and orientation of LIS education systems after a long period of continuous evolutionary transformations. LIS education and training therefore need to prepare for the change and get ready to embrace the opportunities and challenges brought by the revolution.

7.4.2 Competencies encapsulated in LIS curricular

The second critical question of the study was, “what competencies are encapsulated in LIS curricula?” The findings suggest that the competencies encapsulated in LIS curricula are foundational/ core; technological; business/managerial; communication and community services; workplace competencies and interpersonal skills; legal framework for practice; practicum; research; and specialized competencies. The competencies are translated into qualifications as described in the following subsections:

a) Articulation of LIS qualifications

LIS qualifications are conferred within two sectors: University and TVET. Four levels of qualifications are awarded: undergraduate, postgraduate, masters and doctoral degrees. There is a trend towards developing higher degrees in LIS qualifications in Zimbabwe. This was noticeable by the recent introduction of the post graduate diploma, masters and doctoral Degrees. The additions of higher degrees in LIS programmes signify growth and maturity of the academic discipline. However, although there are observable signs of growth and maturity in the LIS academic discipline, LIS educational programmes are fragmented and not synchronized to allow seamless mobility of learners between universities as well as the TVET sectors. An integrated educational system is critical at this point in time where LIS education and training programmes are faced with a myriad of challenges including justification of their existence and relevance, resource constraints, limited faculty capacity, lack of equipment, limited funding and inadequate policies and regulatory frameworks. Therefore, institutional harmonization and collaboration within and across sectors in LIS educational systems might tackle issues of duplication of cost and effort, sustainable use of the available resources, capacity and maximization of free movement of skills.

The findings suggest that the competencies encapsulated in LIS curricula are diverse, interdisciplinary and/or trans-disciplinary in nature, and are continually increasing. The diversity of the competences is consistent with the characterization of revolutionary transformations depicted in the Punctuated Equilibrium Theory. The diverse nature of the competencies in LIS curricula suggests diffusion of disruptive innovations in the profession and its academic discipline. The influx of the competencies in LIS curricula is suggestive of massive deskilling of LIS faculty and practitioners. This suggests that as new competencies are encapsulated in the curriculum LIS academics are continuously deskilled. Similarly as new technologies are released in the market, practitioners are also deskilled. This suggest that as new innovations are added in the LIS field, faculty and practitioners are found wanting in the requisite competencies and knowledge to teach the new courses or perform their roles efficiently. Likewise, this signifies that LIS academics cannot successfully transfer these competencies to their students, exacerbating the problem further. This might also be another reason why LIS graduates are purportedly reproached for not being adequately prepared.

In addition the adoption of disruptive innovations has led to the development and integration of ICT related courses in LIS curricula. This has dismantled the old underlying order and the emerging of a new underlying order is perceptible in LIS education and training. This has been exemplified by the loss of preeminence of LIS traditional technical skills and the ascendancy of ICT, information, interpersonal and multi/inter/transdisciplinary competencies and skills in the LIS curriculum. The transitory and multiplicity nature of the competencies signifies that the new configuration has not been fully achieved, but LIS education programmes and the profession it serves is operating within the hybrid model parameters.

The nature, diversity and multi/inter/transdisciplinary nature of the competencies encapsulated in LIS curricula suggest that LIS education curricula have adopted an outward looking and proactive approach rather than a discipline-specific outlook. The novelty of the courses encapsulated in LIS curricula suggests that they were designed to mitigate perceived environmental demands such as ICTs, globalization, and knowledge/information paradigm or economy. This suggests that new innovations such as ICT, evolving communication cultures and societal changes are driving transformations in LIS education. This suggests that competency, skills and the focus of LIS education and training is molded by the needs and demands of the society it serve. Additionally, the diversity of the competencies signifies that work problems in the LIS profession cannot be understood within the parameters of a single discipline, but there is need to draw from multi/inter/transdisciplinary perspectives.

In addition, the diversity of the competencies suggests expanding core competencies in LIS education curricula. This suggests that the spectrum of competencies encapsulated in LIS curricula is too broad to be covered thoroughly within the time specification of the curricula. The discrepancy between the multiplicity of the competencies encapsulated in LIS curricula and the available time to teach the competencies might be attributed to the alleged claim that LIS graduates were not adequately prepared for their first jobs. A careful evaluation of LIS curricula is therefore needed to obliterate what has become obsolete; envision and add on relevant aspects; preserve and adapt what is essential. There is also a need to balance what is taught within a given time frame for quality reasons. The time limitations therefore indicate the need to develop specialized professional tracks in LIS curricula to ease the congestion, as suggested by Boll (1972).

Furthermore, the data suggest that some of the competencies encapsulated in LIS curricula fall within the confines of IFLA, CILIP, ALA, and SLA published competency frameworks. This suggests that LIS education programmes are aligning their curricula with international trends. However, the trend towards internationalization of LIS curricula, if not properly assessed, might result in the reproduction of curricula from the developed world that do not address perceived environmental needs of the Zimbabwean context. It is, therefore imperative for LIS education and training programmes to design and align LIS curricula according to the needs, capacity and available resources and ICT infrastructure and socio- economic development levels of the country rather than conforming to global trends. Some of the ICT courses integrated in the LIS curricula surpass the available technological capacity of the HEIs and at times of the country. The courses are then taught theoretically and this might be a major reason why LIS graduates are reproached for being inadequately prepared.

Additionally, the diversity of competencies encapsulated in LIS curricula suggests lack of a controlling national accreditation board. A great need exist for a national professional accreditation board for LIS education. Furthermore, in the face of diverse competencies being encapsulated in the LIS curricula, the fundamental tenets of the LIS profession is noticeable in the curricula. This is laudable, as these are the fundamental tenets that define and distinguish the LIS profession from other information related professions and this defining core knowledge will remain useful long after the technological and workplace leaning competencies have cycled out. These fundamental LIS tenets are capable of steering the academic discipline and its profession into the future.

The commonalities of the competencies encapsulated in LIS curricula in university and TVET LIS programmes suggest the blurring of the distinction between paraprofessional and professional work and education. This suggests that LIS graduates are being prepared to understand and perform the whole work processes or roles in the profession. This moreover, suggests that work processes in LIS work environments require a professional who is able to perform tasks with easy transfers across different departments with minimal supervision. This brings into question the rationale of the duplicative LIS education training models (undergraduate and post graduate) as well as the binary divide between university and TVET educational sectors. It is therefore, imperative that issues of LIS education and training models be given serious consideration to avoid duplication of effort and resources, improve

quality control, synchronize the educational programmes and use the available resources in a sustainable manner.

Similarly, the blurring of the distinction between para professional and professional work suggests new organizations of work in the LIS profession. This signifies new organizations of work with flat hierarchical structures characteristic of transformational leadership styles. A paradigm shift from transactional to transformational leadership style in LIS work environments is therefore needed, as well as for LIS education and training programmes to adopt and incorporate transformational leadership doctrines in LIS curricula.

7.4.3 Skills needed by the information industry

The third research question of the study established the LIS skills that are needed by the information industry. The data confirmed that LIS information industry requires LIS professionals to master a suit of LIS domain specific, ICT, knowledge of intellectual property rights, entrepreneurial, teaching/training, and marketing, as well as generic and transferable competencies applicable to real work situations. The diversity and nature of the required competencies suggest unprecedented radical transformations in long-standing sets of professional practices, roles, core knowledge and tools. These shifts point to a great need for enskilling programmes in the profession that requires the development of CPD programmes in LIS education. Furthermore, this also draws attention to the need for lifelong learning focused educational systems in the LIS field.

Additionally, the nature of skills being demanded in the LIS labour market indicates that the special significance of LIS disciplinary knowledge, though still required, is being slowly surpassed by generic and transferable skills. Similarly, the diversity of the competencies required and encapsulated in the LIS curricula, suggests LIS disciplinary evolution and scholarly expansion of the academic discipline. This signifies maturity and growth for the LIS academic discipline.

Furthermore, the emphasis on functional competencies suggests that LIS employers are strongly advocating for the vocationalization of LIS education curricula. The demand on LIS graduates with vocational skills does not only indicate a shift towards operational competencies as opposed to abstract knowledge in LIS work environments, but symbolizes a

paradigm shift in power dynamics between faculty and practitioners in terms of who defines what counts as useful core competencies and whose discourse achieve dominance” (Becher and Trowler, 2001:5). This suggests a struggle for control of LIS education and training products and LIS education processes between educators and industry.

Alternatively, this might signify a paradigm shift from traditional content-driven educational models to competency-based, student-centered, and results-focused education delivery models in LIS education. These trends are observable in LIS educational systems in developed countries and LIS programmes in Zimbabwe need to be prepared in terms of physical, technological, human, and financial infrastructure as well as supportive policy and regulatory frameworks for the imminent shift to the new educational models.

In addition, the demand for applied skills by LIS employers suggests that the balance between abstract versus applied knowledge is not well addressed in LIS curricula. This suggests that LIS education programmes have not optimally mixed theoretical knowledge with significant work place knowledge in the curricula. This could be a contributing factor to the criticism that LIS education programmes are failing to produce industry ready graduates and also signify a gulf between LIS education and practice. LIS education and training is therefore required to develop mutual partnerships and collaborative synergies with practitioners in designing curricula contents and teaching to bridge the gaps.

The environmental changes or new innovations such as exponential growth in information and knowledge, advanced developments in ICTs and changing societal priorities are pressuring change in LIS educational systems. LIS education programmes are operating in an environment where the components of the curricula taught are not in alignment with the changes taking place in the profession, and consequently the requirements of the work environments. By their nature, LIS education and training programmes are slow to respond to change. This might be another reason why LIS education and training programmes are allegedly criticized for not producing adequately prepared graduates. There is, need for wholesale revolutionary transformations in LIS education and training programmes and a swift response to change. In addition the data suggest the need for developing a formal needs assessment model or tool for assessing and predicting future needs in LIS education and training and the profession.

7.4.4 Extent of ICT integration in the LIS curriculum

The fourth research question was to determine the extent of ICT integration in the LIS curricula. The findings revealed that the extent of ICT integration in LIS curriculum is very low. The research data suggested that Zimbabwe is not e-ready in terms of ICT infrastructural development, ICT capacity, connectivity, financial infrastructure, and policy and regulatory frameworks. This suggests that a country's e-readiness is a major contributory factor in ICT integration in LIS curricula and in teaching and learning. There is therefore, a need for the Zimbabwean government to urgently work towards making the country e-ready.

Furthermore, the basis or antecedents for ICT integration is not in place in LIS education and training institutions within Zimbabwe. At the outset the educational structure is not designed to use ICT in teaching and learning and the pedagogical, assessment techniques, learning facilities and resources are at variance with ICT integration and use. This signifies that ICT use in educational systems is not an established culture. It is therefore very difficult to change established education culture overnight without proper awareness programmes, coercive policies and regulatory frameworks. The need to put in place facilitative fundamentals for ICT integration and use in LIS curricula is urgent. This demands sustainable funding, prior research to inform the initiatives, robust regulatory frameworks, leadership commitment and political will.

Despite the inadequacies outlined above, there have been attempts to integrate ICT in LIS curriculum. ICT integration in LIS curriculum is done within the locus of the old paradigm which does not address current needs. This equals to 'add on' ethos or short run adaptations meant to offset pressing perceived environmental demands. This type of change usually deflects attention away from the real problems and suggests that the real problems in LIS curricula are being misdiagnosed. What is required is a complete overhaul of the whole educational system in LIS education and training without which ICT integration will remain at the periphery of LIS education and will not yield the required transformations. Failure to do so will threaten the survival of LIS education.

7.4.5 Human and physical resources for delivering LIS curricula

The fifth research question of the study was meant to ascertain the available human and physical resources for delivering LIS curriculum. The data suggest that the human and

physical resources available for delivering LIS curricula were: skilled human capital, ICT infrastructure and connectivity, physical infrastructure, national and regional policy frameworks, equipment, financial resources, information resources, time, practicum placements, up to date curricula and quality cohort of students. However, the results indicate that the available resources were inadequate to support efficient and quality implementation of LIS curricula changes. The research data attributed the inadequacies to brain drain, limited opportunities for CPD, financial challenges, lack of prioritized physical and ICT infrastructural development (nationally and institutionally), lack of robust, effective and up to date policy and regulatory frameworks to support reforms, and socio-economic challenges prevalent in the country. Therefore, contextual factors play a significant role in educational reforms. There is need to address these contextual factors for noteworthy reforms in LIS education and training to take place.

Resource inadequacies in LIS education and training programmes signify that LIS graduates were not being adequately prepared for their future work roles. This might be a contributory factor to the reproach from employers that LIS graduates were not adequately prepared for the jobs they apply for. It is therefore imperative that LIS education programmes should harness the requisite resources so that quality graduates are produced. Furthermore, resource inadequacies signify that the pace of educational reforms will be very slow. There is, therefore, need for major investments in physical, human, financial, and ICT infrastructure in LIS education and training programmes. This is critical for establishing requisite, modernized and adequate human and physical resources for delivering LIS curricula.

7.4.6 Awareness by LIS faculty about paradigm shifts in the information industry

The sixth research question of the study was to establish the level of awareness regarding paradigm shifts in the information industry by LIS faculty. LIS faculty have a high (93%) level of awareness and perceived knowledge of the paradigm shifts in the information industry. This suggests that members of a social system share information about new innovations through established communication systems. The ubiquitous nature of contemporary social communication channels has facilitated rapid diffusion and adoption of new innovations in the information industry.

7.4.7 Attitudes of LIS academics towards the changes in the information industry

The final research question meant to find out the attitudes among LIS academics towards the revolutionary changes in the information industry. The data suggest that 93% of LIS faculty have positive attitudes while 7% have negative attitudes toward paradigm shifts in the information industry. This suggests two distinct categories of LIS faculty: pessimistic and the optimistic. The optimistic group represents the majority and the pessimistic are the minority. The rising differential between the two groups constitutes the principal evidence that LIS faculty are dissatisfied with the status quo in the LIS field and are ready to embrace the paradigm shifts in the information industry. However, the pessimistic group is satisfied with the status quo and resists change. This suggests that individuals perceive change differently. Therefore, some individuals embrace change enthusiastically, while others resist it.

Conversely, resistance to change might be an indicator of underdeveloped antecedents of change such as competencies, financial, physical and ICT resources. Furthermore, resistance to change may also be attributed to lack of proper strategies for change, lack of management support and commitment, deep rooted dogmas and technophobia. It could be argued that the Bill Gates technological era has resulted in unprecedented transformation and the only alternative for LIS education is to embrace the change. Yet the major question is how to change without losing the core tenets of the profession. This calls for visionary leadership, research to guide the transitions, adequate resources and state of the art technologies.

Within the context of these findings, the study concluded that LIS education and training is changing through short term adaptation measures meant to offset pressing environmental demands. However, although the piecemeal changes in LIS education and training are commendable, they are unable to bring about the fundamental revitalization called for by UNESCO (2009) in HEIs globally. What is needed is radical reengineering of the whole template of LIS education and training (teaching and learning models, curricular contents, assessment methods and teaching and learning philosophies). Piecemeal changes within the framework of past educational principles which served the industrial era are incapable of bring about meaningful educational reforms that are required in LIS education and training in the knowledge economy. Stakeholders in LIS education and training (government, institutional administrators, LIS faculty and students) should seize the opportunities presented by paradigm shifts in society to envision and prepare for the changes philosophically,

financially and in terms of ICT infrastructure, human capacity and teaching and learning methods.

7.5 Research contributions to the body of knowledge

Creswell (1994:2009) asserts that the contribution of research studies to the body of knowledge is determined by the extent to which the studies add to scholarly research in the field of study; inform practice in a community of practice; inform policy; and drive policy improvements in the field.

7.5.1 Contributions to theory

Despite an abundance body of knowledge on LIS education globally such as Ocholla (2007); Mutula (2007); Chu (2001); Rath (2006); Johnson (2007); Buarki, Hepworth, Murray and McKnight (2009); Tenopir (2002); Asundi, Karisiddappa (2007); Andrews, Ellis (2005); Nonthacumjane (2011); Okello-Obura, Kigongo-Bukenya (2011); Virkus (2012); Raju (2013); Al-Dalhani (2011); Buarki, Hepworth, Murray (2011); Chikonzo (2013); Edegbo (2011); Kamba (2011); Subramaniam and Jaeger (2011), there is a dearth of research studies on LIS education and training that focus on the Zimbabwean context. This study, therefore, contributes to this body of scholarly literature by adding Zimbabwe to the global scholarly discourse, literature and research on LIS education and training.

Despite the numerous studies that have been done on most of the specific questions guiding the study, a number of the research questions explored in this study are context specific and unique to this study. For example, specific questions such as: What are the goals of LIS education and training in Zimbabwe? What human and physical resources are available for delivering LIS curriculum? What is the level of awareness about paradigm shift in the information industry by LIS faculty? What are the attitudes of LIS academics regarding paradigm shifts in the information industry? - are unique to this study. As such, this study is an attempt to break new ground in understanding the goals of LIS education and training, human and physical resources required for delivering LIS curriculum, awareness of paradigm shifts and attitudes towards paradigm shifts. This study, therefore, generated baseline data and useful insights that could provide valuable frameworks for further research in LIS education.

The combination of the DOI and Punctuated Equilibrium Theories in studying LIS education and training was unique to this study because the researcher was unable to retrieve other studies that have integrated both theories in a single study. The integrative theoretical framework provides a holistic approach for questioning revolutionary changes and innovation issues in LIS education and training. It offers guidelines for exploring change beyond the norm of most change theories through the provision of robust multiple level analysis platforms such as innovation antecedents, innovation diffusion, and innovation consequences (outcomes) on organizations. The applicability of the theoretical framework in the Zimbabwean context suggests that the framework can be used for exploring similar phenomenon in other environments. The primary contribution of this study consists therefore, of showing the analytical power and robustness of the DOI and Punctuated Equilibrium Theories in analyzing diffusion of innovations and their outcomes in LIS education and training.

Furthermore, the blending of the theoretical constructs gleaned from DOI and Punctuated Equilibrium Theory increased their theoretical powers, credibility, and effectiveness. It also enabled the researcher to study three distinct aspects of innovations (1) antecedents of innovations (2) diffusion of innovations (3) consequences (outcomes) of innovations in a single study. It also facilitated exploration of different forms of change (incremental and revolutionary) by blending one form of change into another. This provided important conceptual tools for understanding, explaining, and making predictions about LIS education and training. Therefore, the integration of two relatively similar change theories (DOI and Punctuated Equilibrium Theory) from distinct research domains in this study enabled the researcher to position this approach in LIS education scholarly discourse, literature and extending research in LIS education and training to new ideas, theories and practices. Conversely, the theoretical approach also enabled the research to position change discourse in LIS education to innovation and organizational revolution literature and research.

7.5.2 Contributions of the research to practice

The study has revealed that advanced developments, knowledge economy and evolving communication culture and changing social priorities have revolutionized LIS practitioner's roles, work environments, information service models and tools. This has had significant

implications for LIS professional education programmes. Should the findings be published in scholarly and professional journals, the expectation is that it will raise understanding and create awareness of the transformation taking place in the society at large and specifically in the LIS profession and its academic discipline.

In addition, for the past decades LIS education and training programmes in Zimbabwe have to a greater extent been redesigning their curricula driven by burning needs to align with perceived environmental demands. However, these transformations were not guided by knowledge derived from empirical studies. The study findings therefore, provide the much needed empirical evidence, baseline data, relevant and insightful guidelines to support informed decisions in curricula designing, reforms and reviews in LIS education and training programmes. LIS education programmes can benefit from the responses provided by LIS employers and LIS graduates in this study. Therefore, the findings of this study have major contributions to make in the future development of LIS curricula and LIS education systems.

Similarly, the study contributes to practice by clearly answering the major question of the study, why LIS education and training programmes are purportedly reproached for producing LIS graduates without the requisite skills to perform right away in their jobs. The study revealed that given the expanding LIS work landscape it is difficult for LIS education programmes to provide the kind of education and training that fits the diverse segments of LIS work environments while at the same time LIS education programmes are bedeviled with lack of faculty capacity, funding, ICT infrastructure, ICT resources, and transient work environments. If the results are acted upon, LIS faculty capacity, funding, ICT infrastructure development, ICT resources could be improved to allow the production of quality LIS graduates.

7.5.3 Contributions of the research to policy

The study hopes to inform and drive policy improvement in LIS education and training by advocating through this study and future publications that LIS educational systems are like any other educational systems and therefore require its own specific guiding policies and regulatory frameworks. This will facilitate proper management, developed and regulation of the educational sector for efficiency and quality education. Thus, the design and provision of discipline specific legislative mechanisms could facilitate synchronization of educational

programmes that facilitate seamless horizontal and vertical mobility of students, establish standards, performance hallmarks, equitable access, quality, relevancy, accountability, and integrity of LIS educational systems.

Additionally, there is a need to develop formal standards of e-readiness in Zimbabwe through robust policy and regulatory frameworks. This will drive the development of the requisite infrastructures and create awareness, raise the importance, and use of ICTs in the wider society and educational systems. Furthermore, there is also need for the development of a specific policy on ICT use in education. This policy will be able to stimulate use of ICT in educational systems from primary to higher and tertiary education. It will also pressurize the development of the requisite ICT infrastructure both at national and at institutional levels as well as the development of ICT proficiency.

The findings provide fundamental information for decision makers at national and institutional levels. It can be used for the purpose of analysis, advocacy and strategic planning for educational reforms. Therefore the findings of this study can be valuable in improving policy in public educational systems. It will contribute towards effective management of LIS education programmes. Moreover, the findings provide valuable insights into why change is slow in educational systems. This might be valuable information to those trying to guide change in public educational systems.

7.6 Future research directions

Based upon the insights gained from this study, several research gaps have been observed which need further research. Notwithstanding, there are several limitations to this study that might be developed into areas of future research directions. Firstly the study focused on public HE LIS education and training programmes in Zimbabwe, therefore little is known about LIS education programmes in private institutions. Further research might provide comparable data on type of programmes offered, challenges, innovations and type of infrastructure available.

Issues of collaboration between LIS faculty and practitioners in teaching were not within the scope of this study. Therefore, further research is required on building collaborative synergies between LIS academics and practitioners and how these mutual synergies can improve the quality of teaching and learning, research and community engagement, and allow equitable access to learning tools and resources which are in short supply in LIS education and training.

Furthermore, research is also required to determine the possibility of establishing LIS special professional tracks in the curricula such as health informatics, law librarianships, school librarianship and knowledge management to ease the congestion of core competencies in LIS curricula.

There is also need to determine the best possible ways to balance teaching and learning, research, and community service and to determine why community service/engagement is relegated to inferior status in LIS education and training.

Future research should take into account all the theoretical variables of the DOI and Punctuated Equilibrium Theories. This might provide a broader understanding of diffusion of innovations and their outcomes in LIS education. Similarly, applying the theoretical framework used in this study in different contexts, with different methodological approaches might yield different or comparable results. Furthermore, after a proposed period of five years of this study, review studies need to be carried out to determine the changes that might have taken place in LIS education and training in Zimbabwe.

7.7 Recommendations for further action

This study suggests that teaching and learning is emphasized more than research, community engagement, ICT and entrepreneurship in LIS education and training. Therefore, the government of Zimbabwe may wish to consider development of strategies for the advancement of research, community engagement, ICT and entrepreneurship. Similar strategies have been developed in other countries such as South Africa (Republic of South Africa, Department of Science and Technology, 2007) that have managed to advance research, ICT development and community engagement. South Africa in 2007 developed a

national Research and Development (R&D) strategy. The strategy was meant to advance ICT, research, development, and innovation (Republic of South Africa, Department of Science and Technology, 2007). The strategy managed to set the agenda and framework for advancing R&D and innovation in science and technology in South Africa. It has managed to strengthen research activities in HE and private institutions and this has facilitated the development of world-class research competencies in South Africa (Republic of South Africa, Department of Science and Technology, 2007).

Furthermore, the findings highlighted that LIS education programmes are not synchronized, there are no common standards guiding the educational sectors, and there are no quality control measures in place. This was exemplified by the diverse arrays of competencies encapsulated in the LIS curricula and the commonalities of competencies in TVET and universities. This may suggest that a professional accreditation body for the LIS profession need to be urgently developed by the Zimbabwe Library Association, to assure accountability, quality control, compliance, and standardization of LIS education programmes. Similar schemes have yielded observable results in countries such as the United States of America (American Library Association (ALA); and the United Kingdom (Chartered Institute of Library Information Professionals (CILIP) (IFLA Education and training Section, 2012; American Library Association, 2009; CILIP, PKSB, 2012).

Similarly, the findings also show that LIS graduates lacked the required competencies needed in the work. This was attributed to a myriad of inadequacies in both human and physical resources. This reflected a disjuncture between what is taught and what is required in LIS work environments. LIS education and training in Zimbabwe is required to build collaborative teaching linkages with practitioners. This needs to be established to rectify the problem of resource inadequacies. Sacchanand (2012) reported that collaboration between LIS educators and practitioners has been used as a strategy to cope with changes and challenges of resource inadequacy before. This strategy is used in the contemporary digital information environment at the Sukhothai Thammathirat Open University (STOU) in Thailand. He further states that this initiative has resulted in developing the required skills in LIS students. The development has improved the quality of teaching and learning, research and promoted learning in context. Collaborative teaching initiatives such as these could also help in bridging the gap between LIS education programmes and practitioners. It could also ensure the provision of the requisite skills required in the transient information environment.

ICT integration in LIS curricular is seriously constrained by lack of ICT capacity, inadequate ICT infrastructure and resources, deficient ICT policy and regulatory frameworks to support ICT use in education, and lack of political will to mobilize the available resources. The government of Zimbabwe may therefore wish to consider the development of national initiatives meant to build and reinforce ICT capacity, ICT infrastructure and policy and regulatory frameworks on ICT use in education. Kotecha, Wilson-Strydom and Fongwa (2012) and Isaacs (2007) stated that similar initiatives have worked in South Africa and Mauritius. He further pointed out that South Africa and Mauritius are exceptional cases in the SADC region. In both of these countries the governments successfully spearheaded ICT infrastructure and capacity development in preparation for the knowledge economy. Such initiatives need to involve a wide network of stakeholders such as: communities, private sectors, donors, and development agencies as well as the government organizations. In South Africa for example, such initiatives have led to at least 22% computer penetration in all public schools” (Isaacs, 2007:2).

Additionally, the findings revealed that CPD structures are nonexistent in the LIS education sector in Zimbabwe. Policy makers, LIS education administrators, and private players should therefore establish sustainable, home grown and structured CPD frameworks for the LIS profession. Rothstein (1965) argued that, LIS education programmes should involve specialized professional organizations and private players rather than general LIS professional organizations. In the South African context, Sewdass and Theron (2004) developed a structured framework for CPD of LIS personnel. Initiatives such as these have also been adopted and implemented successfully in United States of America by the American Library Association (ALA) and in the United Kingdom by the Chartered Institute of Library and Information Professionals (CILIP) (American Library Association, 2009; CILIP, PKSB, 2012). The ALA and CILIP CPD initiatives have successfully managed to offer robust CPD programs in their respective countries.

In addition LIS curricula in Zimbabwe are not designed to promote lifelong learning. Policy makers and LIS education programmes should promote lifelong learning. This can be supported by the adoption of a spiral curriculum in LIS education programmes. Other professional educational programmes such as medicine, nursing, music; ballet and contemporary dance have adopted a spiral curriculum in support of lifelong learning. Masters and Gibbs (2007) suggest that a spiral curriculum in medical education deepens learning and

promotes lifelong learning. This curriculum involves continuously revisiting concepts previously studied. Each time the concept is revisited it is broadened to a higher and higher levels and to new problems and issues (Masters and Gibbs, 2007).

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LIST OF APPENDICES

APPENDIX 1: Interview schedule for Deans/HODS



Research Topic: Library and Information Science (LIS) education and training in Zimbabwe and paradigm shift in the information industry.

Researcher: Pedzisai Munyoro

Interviewer: The study is on LIS education and training in Zimbabwe and paradigm shift in the information industry. Participation is voluntary and participants are free to withdraw from the study at any stage. Data collected in this study is intended for the purpose of the research. Data collected through this interview will be kept for three years in accordance with the University regulations and thereafter will be discarded. Anonymity will be ensured when reporting the findings in the thesis, conferences and from any publications resulting from this study. I kindly ask your permission to tape record the interview as well as write supplementary notes. If you agree that we may proceed with the interview, would you please sign this consent form.

Signature_____

Interview date: _____

Name of institution: _____

Section A

Q1: Can you comment on the changes that have taken place in the LIS profession.

Prompts: How have these changes impacted on your professional career?

Q2: Reflecting on your own training and education and your preparedness for the various roles and positions you have had in your career, can you comment about the type of education you received and its applicability and adequacy for your first job in the LIS profession?

Q3: What are the goals of LIS education and training programmes in Zimbabwe?

Section B

Q4. The Vice Chancellor of the University of Nairobi when addressing LIS professionals in 1997 poignantly stressed that “...LIS graduates are not well suited or prepared for the job market...” Comment on this view point in light of education and training for LIS in Zimbabwe.

Prompts: Do you think LIS education and training programmes are meeting the needs of LIS employers in Zimbabwe?

Section C

Q5. Have LIS education and training programmes invested in ICT infrastructure to facilitate ICT integration in the curricular?

Prompts: To what extent have you invested in ICT infrastructure, resources and facilities?

Section D

Q6. What human and physical resources are available integral for delivering LIS curricular? Elaborate.

Prompts: Could you expand on your views?

Section E

Q7. Have you published in scholarly journals?

Yes.....

No.....

If yes please list the name of scholarly journals you have published in.

Q8. Do you have any additional comments you feel would be helpful for this study?

Section F: Biographical data

Highest qualification.....

Position held.....

Experience.....

Thank you for your time.

APPENDIX 2: Interview schedule for LIS employers



Research Topic: Library and Information Science (LIS) education and training in Zimbabwe and paradigm shift in the information industry.

Researcher: Pedzisai Munyoro

Interviewer: The study is on LIS education and training in Zimbabwe and paradigm shift in the information industry. Participation is voluntary and participants are free to withdraw from the study at any stage. Data collected in this study is intended for the purpose of the research. Data collected through this interview will be kept for three years in accordance with the University regulations and thereafter will be discarded. Anonymity will be ensured when reporting the findings in the thesis, conferences and from any publications resulting from this study. I kindly ask your permission to tape record the interview as well as write supplementary notes. If you agree that we may proceed with the interview, would you please sign this consent form.

Signature: _____

Interview date: _____

Name of institution: _____

Section A

Q1: Can you comment on the changes that have taken place in the LIS profession.

Prompts: How have these changes impacted on your professional career?

Q2: Reflecting on your own training and education and your preparedness for the various roles and positions you have had in your career, can you comment about the type of education you received and its applicability and adequacy for your first job in the LIS profession?

Section B

Q4. The Vice Chancellor of the University of Nairobi when addressing LIS professionals in 1997 poignantly stressed that —.LIS graduates are not well suited or prepared for the job market...” Comment on this view point in light of education and training for LIS in Zimbabwe.

Prompts: Do you think LIS education and training programmes are meeting the needs of LIS employers in Zimbabwe?

Section C

What skills are required of LIS professionals‘ in the contemporary workplace?

Prompts: Could you expand on your views?

Section D: Biographical data

Highest qualification.....

Position held.....

Experience.....

Thank you for your time.

APPENDIX3: Questionnaire for LIS faculty



Library and Information Science Education and Training in Zimbabwe and Paradigm Shift in the Information Industry.

Researcher: Pedzisai Munyoro

The study is on LIS education and training in Zimbabwe and paradigm shift in the information industry. Participation is voluntary and participants are free to withdraw from the study at any stage. Data collected in this study is intended for the purpose of the research. Data collected through this survey questionnaire will be kept for three years in accordance with the University regulations and thereafter will be discarded. Anonymity will be ensured when reporting the findings in the thesis, conferences and from any publications resulting from this study. If you agree, would you please sign this consent form.

Signature_____

Interview date: _____

Name of institution: _____

Thanking you in advance

P. Munyoro

munyoropedzisai@gmail.com

Section A:

Name of institution.....

Q1. What changes in LIS have impacted on your professional/academic career, practice or working life?

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Q2. Reflecting on your own training, education and your preparedness for the various roles and positions you have had in your career, how do you think the professional education you received prepared you adequately for your first job?

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Q3. The Vice Chancellor of the University of Nairobi when addressing LIS professionals in 1997 poignantly stressed that —. LIS graduates are not well suited or prepared for the job market...” Comment on this view point in light of education and training for LIS in Zimbabwe.

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Section B

Q4. Have you integrated ICT in teaching and learning? Elaborate

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Section C

Q5. What human and physical resources are available and are integral for delivering LIS curricular? Elaborate

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.....

Q6. How adequate is the available resources in your department to deliver LIS education and training curricular? (Please tick the appropriate answer)

More than adequate

Adequate []

Undecided []

Inadequate []

Most inadequate []

Section D

Q7. What are your perceptions about paradigm shifts in the information industry?

Q8. Have you published in scholarly journals?

Yes.....

No.....

If yes please list the name of scholarly journals you have published in.

.....

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Section B

Q9. Please read each statement carefully and then tick the number that represents your degree of agreement or disagreement with the statement using the following options:

1 =Strongly agree

2=Agree

3= Undecided

4=Disagree

5=Strongly disagree.

Questions	1	2	3	4	5
LIS education programmes in Zimbabwe have invested considerably in ICT infrastructure.					
There have been paradigm shifts in the information industry from: specific domains to information pathways; repository to open access; user to a client paradigm; from analogue to digital paradigm; from “just in case” to “just in time” and from Library Science to Information science.					
Adoption and use of ICT in LIS education and training has an advantage over previous innovations					

Q10. Do you have any additional comments you feel would be helpful for this study?

.....

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.....

.....

Section C: Biographic Information of respondents

Age range 20-30 years_____

31-40_____

41-50_____

51-60_____

Gender

Male _____ Female _____

Years of experience _____

Highest attained qualification _____

Position held _____

Thank you for taking your time to complete this questionnaire

APPENDIX 4: Questionnaire for LIS final year students



Library and Information Science Education and Training in Zimbabwe and the Paradigm

Shift in the Information Industry.

The study is on LIS education and training in Zimbabwe and paradigm shift in the information industry. Participation is voluntary and participants are free to withdraw from the study at any stage. Data collected in this study is intended for the purpose of the research. Data collected through this survey questionnaire will be kept for three years in accordance with the University regulations and thereafter will be discarded. Anonymity will be ensured when reporting the findings in the thesis, conferences and from any publications resulting from this study. If you agree, would you please sign this consent form.

Signature_____

Interview date: _____

Name of institution: _____

Thanking you in advance

P. Munyoro

Email: munyoropedzisai@gmail.com

Instructions

Please indicate your appropriate response by means of a cross or tick. Where possible elaborate in the space provided.

Part A

Q1 Qualifications to be attained

☐ Degree

☐ Diploma

☐ Other please specify

Q2 Gender

☐ Male

☐ Female

Part B

Q3. LIS graduates are not well suited or prepared for the job markets... comment on this view point.

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Q4. Do you think the training you received has sufficiently prepared you to address the current job environment?

☐ No

☐ Yes

Please elaborate

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Q5. Do you have any additional comments you feel would be helpful for this study?

.....

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.....

Thank you for taking your time to complete this questionnaire

APPENDIX 5: Document review checklist



Library and Information Science Education and Training in Zimbabwe and the Paradigm

Shift in the Information Industry.

1. How are LIS education and training programmes articulated in Zimbabwe?
2. How are LIS education and training programmes accredited in Zimbabwe?
3. What are the competencies encapsulated in the LIS curricular?
4. What is the extent of ICT integration in the LIS curricular?

APPENDIX 6: List of libraries

LIBRARY	TEL. NO.	FAX NO.	ADDRESS
NLDS Harare	705441/734051-9	705441	Box 758 Harare
NLDS Bulawayo	09-230196	257662	Box 1773 Bulawayo
Ministry of Education	734051-9 Ext2208	705441	Box 758 Harare
Agriculture (AREX)	704531	734646	Bag 594 Harare
Zimbabwe National Army	731831 Ext 2025	723710	Bag 7720 Harare
Central Statistical Office	706681 Ext 131	728529	Box 342 Harare
Civil Aviation Authority	585073	-	Box 7716 Harare
Surveyor General's Office	775550/2	780880	Box 540 Harare
Education Service Centre	333820	-	Box MP 133 Harare
Higher & Tertiary Education	796441	795891/5	Box 275 Harare
Finance	739365	-	Bag 7705 Harare
Foreign Affairs	794681	790501	Box 4240 Harare
Geological Survey	726342	253626	Box 210 Harare
Herbarium Botanic Gardens	726313	-	Box 550 Harare
Ministry of Health	729154	729154	Box 1122 Harare
Industry and Commerce	791823	723765	Box 7708 Harare
Information and Publicity	703891/5	790402	Box 4240 Harare
Municipality of Chitungwiza	070-23399	-	Unit F Chitungwiza
Meteorological Services	704955	-	Box BE Belvedere
Public Service	790871	794568	Box 7707 Harare
National Arts Council	304526	304510	Box 10463 Harare
Murewa Culture Centre	0278-22129	-	Box 608 Murewa
Physical Planning	706258	735662	Box 968 Harare
Research and Specialist Services	704531	731133	Box 8108 Harare
Research Council of Zimbabwe	727559	726860	Box 294 Harare
Transfer Technology and Transfer	253905	-	Box 597 Harare
Transport and Communication	734384	708225	Box 595 Harare
Veterinary Research Laboratory	-	-	-
Rural resources and Water Development	700596	738165	Box 7767 Harare
Attorney General's Office	774586/9	-	Bag 7714 Harare
National Parks and Wildlife Authority	707624 Ext 126	721491	Box 140 Harare
Natural Resources Board	705662	793123	Box 385 Harare

LIBRARY	TEL. NO.	FAX NO.	ADDRESS
Local Government	704561	729481	Box 441 Harare
High Court of Zimbabwe	725113	736431	Box 275 Harare
Supreme Court	798634	-	Box 870 Harare
Science and Technology	794129	-	-
High Court Bulawayo	09-61603	-	Box 579 Bulawayo
Environment and Tourism	701681	773276	Bag 7753 Harare
Ministry of Lands	797325	792936	Box 7779 Harare
Public Service Commission	700881	-	Bay 440 Harare
Parliament of Zimbabwe	700181-9/ 252936/40	252935	Box 298 Harare
Ministry of Defence	-	-	Bag 7713 Harare
ZIPAM	062-2001/7	3580	Box 126 Norton-
MTB	486804	486435	Box 240 Harare
Vocational Training Centre	486872	486941	Box 182 Harare
Domboshava Training Centre	882960	882960	Box 7746 Harare
Alvord Training Centre	0239-62026	-	Box 9024 Masvingo
HIT	741422	741406	Box 227 Harare
Highlands National Training Centre	497272	332183	Box 197 Harare
Zimbabwe Military Academy	0254-2874	-	Box 734 Gweru
Police Staff College	700931	253103	Box 1365 Harare
Chibero College of Agriculture	062-2230	-	Bag 901 Norton
Mlezu Agriculture Institute	055-3087	-	Bag 8062 Kwekwe
Esigondini Agriculture Institute	088-296/7	-	-
Gwebi College of Agriculture	3045116	338855	Bag 376 Harare
Bulawayo Technical College	09-2333181	71165	Box 1392 Bulawayo
Chinhoyi Technical College	067-27215	23726	Box 7724 Chinhoyi
Gweru Technical College	052-23117	21870	Box 137 Gweru
Harare Polytechnic College	752311	720955	Box 407 Harare
Kwekwe Technical College	055-22991	22102	Box 399 Kwekwe
Masvingo Technical College	039-52176	53093	Box 800 Masvingo
Mutare Polytechnic College	020-63141	66912	Box 640 Mutare
Masvingo Teacher's College	039-63529	72072	Box 760 Masvingo
Marymount Teacher's College	020-64734	63889	Box 20 Mutare
Seke Teacher's College	070-23578	-	Box 41 Seke
Hillside Teacher's College	09-242283	-	Bag 2 Hillside Bulawayo

LIBRARY	TEL. NO.	FAX NO.	ADDRESS
Mkoba Teacher's College	054-50041	-	Box 20 Mkoba
Mutare Teacher's College	020-64623	64665	Box 3293 Mutare
Morgenster Teacher's College	039-7220	-	-
Bondolfi Teacher's College	039-63893	63894	Bag 9050 Masvingo
Nyadire Teacher's College	0272-2516	2516	Box 210 Mutoko
Belvedere Teacher's College	778189	778171	Box 100 Belvedere
ZINTEC (Morgan Trs College)	770534	771192	Box 1700 Harare
Joshua N. Nkomo Polytechnic College	084-22593	2223	Bag 5832 Gwanda
Kushinga Phikelela Technical College	0279-24484	24462	Bag 3716 Marondera
Zimbabwe Open University	758062	303151	Box MP 1119 Harare
University of Zimbabwe	303211	353822	Box PM145 Harare
Africa University	020-66172	-	Box 1320 Mutare
Solusi University	09-83226	-	Bag T5399 Bulawayo
NUST University	09-282842	-	Box 1460 Bulawayo
Catholic University	570169	573973	Box 3442 Harare
Bindura University	071-7530	-	Bag 1020 Bindura
Midlands State University	054-60519	60069	Bag 9055 Gweru
Westgate Vocational Training Centre	09-74110	77492	Box 1585 Bulawayo
United College of Education	09-71162	-	Box 1156 Bulawayo
Zimbabwe College of Forestry	020-664328	60158	Box 660 Mutare
Harare Theological College	573936	-	Box 60 Harare
Madziwa Teacher's College	0775 140 098	-	Box 140 Shamva
Forest Industries Training Centre	020-62748	-	Box 977 Mutare
ZESA Technology Centre	741525	-	Box 4360 Harare
Marondera General Hospital	0279-24876	23082	Box 20 Marondera
ICL Zimbabwe	-	-	Box 2196 Harare
Marondera Children's Library	0279-23356	24944	Box 261 Marondera
Technical Library Air Zimbabwe	575111 Ext 2426	575092	Box AP1 Harare
Municipality of Kwekwe	055-40052	24301	Bag 8013 Kwekwe
City Treasure's Dept	752979	-	Box 1680 Harare
Air Force of Zimbabwe – Gweru	054-23241	-	Box 738 Gweru
School of Social Work	751815	-	Box 66022
ZAMASCO	053-6441	701944	Box 902 Peak

LIBRARY	TEL. NO.	FAX NO.	ADDRESS
Ministry of Youth	707741	701944	Bag 7762 Harare
Harare City Library	751834	-	Box 1087 Harare
Harare Municipality Library	668516	-	Box 1976 Harare
Dombotombo Library	0279-24224	24944	Box 7 Marondera
Zim Tourism Authority	758730	758826	Box 286 Harare
Kwekwe School of Nursing	055-22333	-	Box 391 Kwekwe
ZBC	498631	-	Box 9040 Harare
Bindura Hospital	071-7880	-	Bag 940 Bindura
ZNFPD	620281	-	Box 220 Harare
Chinhoyi Hospital	067-223055	-	Box 17 Chinhoyi
Redcliff Municipality	055-68787	-	Box 100 Redcliff
Matopos Research Centre	0838-212	-	PBK 5137 Matopos
FAO	252015 Ext 226	700724	Box 3730 Harare
SIRDC	-	-	Box 6640 Harare
Scanlen and Holderness	702560	-	-
IUCN- World Conservation Union	728266	-	Box 745 Harare
SARDC	-	-	-
ZWRCN	-	-	Box 2192 Harare
SAPES Trust	736035	-	Box MP 111 Harare
WHO	-	-	Box 348 Harare
UNIFEM	792681	-	Box 4775 Harare
Zimbabwe Prison Services	496959	-	Bag 7718 Harare
Nyahuni Adventist High School	0278-2058	-	Bag 623 Murewa
UNIC	-	-	Box 4408 Harare
RBZ	703001	-	Box 1283 Harare
ZIMRA Mutare	020-64332	64371	Box 890 Mutare
ZIM AIDS Network	0733 252 742	-	9 Abel Road Greendale Harare
ZIMRA Harare	790811	-	Box 4360 Harare
Victoria Falls Public Library	-	-	Box 41 Victoria Falls
Zimbabwe Staff College	700428	-	Box 7769 Harare
Umbermensch	573974	-	13 Audley Cranborne
Chitungwiza Central Hospital	070-31138	-	Box CZA 245 Zengeza
Harare Central Hospital	621100-19	66449	Box ST 14 Harare
Harare Central Prison Adult School	793891	-	Bag 188 Harare
Heritage School	861988	-	Box BW 1220 Harare
Legal Resources Foundation	251170	-	Box 918 Harare
ZIMISIS	-	-	-
Gwanda Provincial Hospital	-	-	Box 125 Gwanda

LIBRARY	TEL. NO.	FAX NO.	ADDRESS
NRZ	0773 477 186	-	-
Media Information and Publicity	-	-	-
Zimbabwe Defense Forces	-	-	Box 7713 Harare
Edward Memorial Library	0284-21418	-	-
Auditor General	0772 541 685	-	-
Morgan Zintec	771190 Ext 223	-	-
City of Harare	752979	-	-

APPENDIX 7: List of final years students

NUST:LIST OF FINAL YEAR STUDENTS	
REG. NO	
N011 1361A	H0111233*
N011 1272E	P0111234F
N011 0564A	P0111432D
N011 1302E	P0111123A
N011 1319K	P0111123A
N011 1310P	P0111761N
N011 1321E	P0111654C
N011 0171R	P0111234B
N011 1400R	P0111321T
N011 1380Q	P0111142Q
N011 1385P	P0111356Y
N011 1381D	P0111261R
N011 1364I	P0111621S
N011 1261J	P0111412J
N011 1365W*	P0111221M
N011 0224E	P0111312K
N011 0468A	P0111214F
N011 1377Q	P0111461K
N011 0551A	P0111416H
N011 1344K	P0111815M
N011 0308G	P0111714L
N011 4391D	P0111371K
N011 1536D	P0111532P
N011 1373D	P011 1495Y
N011 1274G	P011 2521B
N011 1295J	P011 1632H
N0111372D	P011 193V
N0111267K	P010 8170Z
N0111312G	P011 3967L
N0111265L	P011 3825T
N0111386P	P011 1741B
N0111201J	P011 3850Z
N01113042K	P011 1467P
N0111223P	P011 9782B

HARARE POLYTECHNIC:LIST OF FINAL YEAR STUDENTS	
REG. NO	
GR141 02	BN3416
GR14103	BN3417
GR14104	BN3418
GR14105	BN3419
GR14106	BN3420
GR14107	BN3421
GR14108	BN3422
GR14109	BN3423
GR14110	BN3424
GR14111	BN3425
GR14112	BN3426
GR14113	BN3427
GR14114	BN3428
GR14115	BN3429
GR14116	BN3430
GR14117	BN0117
GR14118	BN0118
GR14119	BN0119
GR14120	BN0120
BN341	
BN342	
BN343	
BN344	
BN345	
BN346	
BN347	
BN348	
BN349	
BN3410	

BULAWAYO: LIST OF FINAL YEAR STUDENTS	
REG. NO	
SS02	SS116A
SS03	SS117
SS04	SS118
SS05	SS119
SS06	SS120
SS07	SS121
SS08	SS122
SS09	SS123
SS10	SS124
SS111	
SS112	
SS113	
SS114	
SS115	
SS116	

JUSHUA NQABUKO NKOMO: LIST OF FINAL YEAR STUDENTS	
REG. NO	
NQ20122	
NQ20133	
NQ20134	
NQ20135	
NQ20136	
NQ20137	
NQ20138	
NQ20139	
NQ201310	
NQ201311	
NQ201312	
NQ201313	

APPENDIX 8: Ethical Clearance Letter



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

27 March 2012

Mrs P Munyoro (212557163)
School of Information Studies

Dear Mrs Munyoro

Protocol reference number: HSS/0193/012D

Project title: Library and Information Science (LIS) Education & Training in Zimbabwe and Paradigm Shift in the Information Industry

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

A handwritten signature in black ink, appearing to read 'S. Collings', is written over a dotted line.

Professor Steven Collings (Chair)
Humanities & Social Science Research Ethics Committee

cc: Supervisor: Professor SM Mutula
cc: Academic Leader: Professor Victor Muzvidziwa
cc: Mrs B Jacobsen

APPENDIX 9: Letter of Introduction



TO WHOM IT MAY CONCERN

RE: Introducing Mrs Pedzisai Katuli Munyoro – PhD Student at University of KwaZulu Natal

This letter serves to introduce and confirm that Mrs Pedzisai Katuli Munyoro is a duly registered PhD (Information Studies) candidate at the University of KwaZulu Natal. The title of her PhD research is 'Library and Information Science Education in Zimbabwe and paradigm shift- in the information industry.

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 she is expected to undertake original research in an environment and place of her choice. The UKZN ethical compliance regulations require her 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 Mrs Pedzisai Katuli Munyoro permission to carry out research in your organisation(s). Should you need any further clarification, do not hesitate to contact me.

Thank you in advance for your understanding

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

Founding Campuses:  Edgewood  Howard College  Medical School  Pietermaritzburg  Westville

School of Social Sciences

Postal Address: Private Bag X01, Scottsville, 3209, South Africa

Telephone: +27 (0) 33 260 5571

Facsimile: +27 (0) 33 260 5092

Email: mutulas@ukzn.ac.za

APPENDIX 10: Letter requesting permission to conduct research



Room 17, Block A
Denison Residence Phase 5
University of KwaZulu-Natal (UKZN)
Pietermaritzburg Campus
Private Bag X01
Scottsville 3209
South Africa
Cell: Zimbabwe – 0772 874512
South Africa- 0027-0826232708
Email: Munyoropedzisai@gmail.com
Sose47@yahoo.com

16May 2012

The Registrar
National University of Science and Technology (NUST)
P. O. Box AC 939
Ascot
Bulawayo
Zimbabwe

Re: Application for permission to conduct research in your institution

I am a student with the University of KwaZulu-Natal, Pietermaritzburg Campus, South Africa, studying towards a PhD in Information Studies. As part of my studies I am carrying out a research project entitled '**Library and Information Science Education/Training and Paradigm shift in the Information Industry**'. I write to seek permission to include your institution in the study. I am studying all institutions offering Library and Information Science education and training in Zimbabwe which include: National University of Science and Technology, Zimbabwe Open University, Harare Polytechnic, Bulawayo Polytechnic and Kwekwe Polytechnic.

The respondent the study are academics and I will collect data through interviews and questionnaires. Participation in this research is voluntary and respondents may refuse to participate or withdraw from the

Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

School of Social Sciences

Postal Address: Private Bag X01, Scottsville, 3209, South Africa
Telephone: +27 (0) 33 260 5571 Facsimile: +27 (0) 33 260 5092
Email: mutulas@ukzn.ac.za

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 the respondents will be maintained by the Department of Information Studies, at the University of KwaZulu-Natal. For further information please refer to the Informed Consent Letter and the motivation letter from my supervisors.

For any questions or concerns concerning this study please feel free to contact my supervisors. The details are as below:

Supervisor: Prof. Stephen Mutula
Institution: University of KwaZulu-Natal
Telephone number: 0027-33-260 5571
Email address: Mutulas@ukzn.ac.za

Thank you in advance.

Mrs Pedzisai Katuli Munyoro



Founding Campuses:  Edgewood  Howard College  Medical School  Pietermaritzburg  Westville

School of Social Sciences

Postal Address: Private Bag X01, Scottsville, 3209, South Africa
Telephone: +27 (0) 33 260 5571 Facsimile: +27 (0) 33 260 5092
Email: mutulas@ukzn.ac.za

APPENDIX 11: Letters Granting Permission to Conduct Research

*All official communications should
be addressed to*
"The Secretary"

Telephone: 795891-5, 796441-9,
730055-9
Fax: 733070
Telegraphic address "EDUCATION"



Reference: E/7/6

SECRETARY FOR HIGHER AND TERTIARY
EDUCATION, SCIENCE AND TECHNOLOGY
DEVELOPMENT

P.O. Box CY 7732
Causeway

HARARE

4th March 2014

Mrs. P. Munyoro
House Number 8547
Kuwadzana Phase 3
P.O. DZ
Harare

Dear Mrs. P. Munyoro

REQUEST FOR PERMISSION TO CARRY OUT RESEARCH ON "LIBRARY AND INFORMATION SCIENCE EDUCATION/TRAINING PARADIGM SHIFT IN THE INFORMATION INDUSTRY."

Reference is made to your letter, in which you request for permission to carry out an educational research on ***"Library and Information Science Education/Training paradigm Shift in the Information Industry."***

Accordingly, be advised that the Head of Ministry has granted permission for you to carry out the research at ***Harare, Bulawayo and Kwekwe Polytechnics***

It is hoped that once completed your research will benefit the Ministry. Accordingly, it would be appreciated if you could supply the Office of the Permanent Secretary with a final copy of your study, as the findings would be relevant to the Ministry's strategic planning process.

A handwritten signature in dark ink, appearing to read 'MJ Chirapa'.

MJ Chirapa

for: PERMANENT SECRETARY



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

14 January 2013

Mrs Pedzisai Katuli Munyoro
University of KwaZulu-Natal
Private Bag X01,
Scottsville, 3209
SOUTH AFRICA


Dear Mrs Munyoro

RE: REQUEST FOR PERMISSION TO CONDUCT A RESEARCH AT NUST

Reference is made to your letter dated 16 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 project: *"The Library and Information Science Education/Training and Paradigm shift in the Information Industry"*, for your PhD studies in Information Studies.
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



ZIMBABWE OPEN UNIVERSITY

"Empowerment Through Open Learning"



MEMORANDUM

TO : Acting Chairperson,
Information Science and Records Management **REF:** NC/14/1/1

FROM : Registrar **EXT:** 236

DATE : 16 August 2012

RE : **PERMISSION TO CARRY OUT RESEARCH IN THE
INFORMATION SCIENCE AND RECORDS MANAGEMENT
DEPARTMENT: PEDZISAI KATULI MUNYORO**

Reference

'A' Your memorandum ASS/1/7/1 dated 15 August 2012.

We acknowledge receipt of reference 'A' above.

Please be advised that permission is granted for the applicant to include Zimbabwe Open University in her research. We would really appreciate it if the University gets feedback on the research findings.

Thank you.

D. NDUDZO

APPENDIX 12: Informed consent letter



Information Studies
School of Social Sciences
University of KwaZulu-Natal
Pietermaritzburg Campus Private bag X01
Scottsville
3209
South Africa

26 March 2012

Informed Consent Letter

Researcher Contacts

Pedzisai Munyoro
University of KwaZulu-Natal
Cell No. SA: 0826232708
E-mail: Munyoropedzisai@gmail.com

Supervisor Contacts

Prof. Mutula S.M.
University of KwaZulu-Natal
Phone: 0332605571
E-mail Mutulas@ukzn.ac.za

Dear respondents

I, Munyoro Pedzisai of the University of KwaZulu-Natal, kindly invite you to participate in the research study entitled **Library and Information Science Education and Training in Zimbabwe and Paradigm shift in the information industry**. The study is undertaken as

part of the requirements of the PHD programme, which is undertaken through the University of KwaZulu-Natal, Information Studies department.

Participation in this study is voluntary and you are free to withdraw from the study at any stage for any reason without any form of disadvantage. Data collected in this study is exclusively intended for the purpose of this study. 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. Data collected in this study will be kept for three years in accordance with the University regulations and thereafter will be disposed. Complete anonymity will be ensured when reporting the findings in the thesis, conferences and from any publications resulting from this study.

If you have any questions or concerns about participating in the study, please feel free to contact myself or my supervisor at the contact details above. Please kindly sign the consent form if you agree to participate.

I..... Hereby consent to participate in the study.

Name.....

Signature.....

Date

Thank you for participation in this study.

APPENDIX 13: Definition of terms

Antecedent Variables	Factors preceding the process of disseminating the innovation these include: the innovation, the targeted adopters and their socio-organizational contexts, as well as the flow of information about the innovation through various communication structures and channels (Warford, 2005:5).
Attitude	Attitude is defined as a learned predisposition to behave in a consistently favorable or unfavorable way with respect to a given object (Schiffman, Kanuk, and Wisenbirt, 2010:246).
Deep structure	Deep structure is the set of fundamental "choices" a system has made of (1) the basic parts into which its units will be organized and (2) the basic activity patterns that will maintain its existence (Gersick, 1991:14).
Diffusion	Diffusion is "the process by which an innovation is communicated through certain channels; over time among the members of a social system" (Rogers and Scott, 1997: 4).
Employability skills	Employability skills are a set of achievements – skills, understandings and personal attributes – that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy” (ESECT and HE, 2004:8).
Innovation	Innovation is any new idea, practice, or object considered new to individual or other units of adoption” (Rogers, 2003:11).
Paradigm	A paradigm may be viewed as a set of basic beliefs (or metaphysics) that deals with ultimates or first principles. It represents a worldview that defines, for its holder, the nature of the world ,” the individual’s place in it, and the range of possible relationships to that world and its parts, as, for example, cosmologies and theologies do. The beliefs are basic in the sense that they must be accepted simply on faith (however

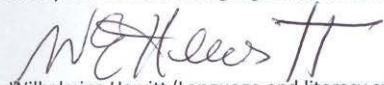
well argued); there is no way to establish their ultimate truthfulness (Denzin 1994:107).

Revolution periods Revolution periods is defined as “brief intense periods of transformative changes”(Tushman and Romanelli, 1985:175).

APENDIX 14: Editors report

To Whom It May Concern

This is to certify that the PhD Thesis of was submitted for language editing. A full language editing was done with comments and recommendations given concerning how the text can be further improved for clarity and the use of language more concise.

A handwritten signature in black ink, appearing to read 'W. Hewitt', with a stylized flourish at the end.

Wilhelmina Hewitt (Language and literacy specialist)

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