

JIMMA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
DEPARTEMENT OF INFORMATION SCIENCE

**Investigation of Digital Information Literacy Skills for Academic
Competencies in Selected Ethiopian Higher Learning Institutions**

By
Hiwot Aydefer

May, 2014
Jimma University, Ethiopia

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Principal Advisor: Getachew Bayissa

Co-advisor: Worku Jimma

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Hiwot Aydefer

Name and signature of Members of Examining Board

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_____	Chairperson	_____	_____
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_____	Examiner,	_____	_____

Approval Sheet

This thesis entitled “*Investigation of Digital Information Literacy Skills for Academic Competencies*” has been read and approved as meeting the partial fulfillment for the award of degree of Masters of Science in Electronic and Digital Resource Management in Department of Information Science, School of Graduate Studies, Jimma, Ethiopia.

Departmental Graduate Committee

Chairman
	Signature	Date

Getachew Bayissa
Principal Advisor	Signature	Date

Worku Jimma
Co- Advisor	Signature	Date

Declaration

I declare that “**Investigation of Digital Information Literacy Skills for Academic Competencies in Selected Ethiopian Higher Learning Institutions**” is my work and that all the sources that I have used or quoted have been indicated or acknowledged by means of complete references.

Signature

Hiwot Aydefer

Date

Dedication

This thesis is dedicated to my beloved husband Dr. Dereje Nigussie, and our families. I love you all.

Acknowledgment

First and foremost, I would like to express my sincere gratitude to my advisors Mr. Getachew Bayissa and Mr. Worku Jimma for their patience, motivation, enthusiasm, and immense knowledge. Their guidance helped me in all the time of research and writing of this thesis. I could not have imagined having a better advisors and mentors.

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Acronyms

ALA:	American Library Association
CD-ROM:	Compatible Disk- Read Only Memory
DC:	Decision Column
ECDL:	European Computer Driving Licence
EDR:	Electronics and Digital Resource
HCA:	Hawassa College of Agriculture
HE:	Higher Education
HEI:	Higher Education Institutions
HU:	Hawasa University
F:	Frequency
IDLC:	Digital Information Literacy Competency
IL:	Information Literacy
ICT:	Information Communication Technology
IT:	Information Technology
JISC:	Joint Information Systems Committee
JU:	Jimma University
KNUST:	Kwame Nkrumah University of Science and Technology
LIASA:	Library and Information Association of South Africa
MS:	Micro Soft
NL:	New Zealand NL
OPAC:	Online Public Access Catalog
QAA:	Quality Assurance Agency
SD:	Standard Deviation
UBL:	University of Botswana Library
UK:	United Kingdom
UNESCO:	United Nations Educational, Scientific, and Cultural Organization
USA:	United State of America
WU:	Welkite University
X:	Mean

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Abstract

Digital information literacy skills allow individuals to recognize the need for, to access, and to evaluate electronic information. Information literate person can confidently use, manage, create, quote and share sources of digital information in an effective way. The way in which information is used, created and distributed demonstrates an understanding and acknowledgement of the cultural, ethical, economic, legal and social aspects of information. The main aim of this study is to investigate digital information literacy verses academic competencies in Ethiopian higher learning institutions. This study could provides a framework for developing an understanding of the digital information literacy skills of both academic staffs and students in relation to research skills, including information seeking and information use and also to ascertain the source of digital information for academic staffs and students use most. In this study the researcher used both qualitative and quantitative research design. Closed and open ended questionnaire, semi structured in-depth interviews and open-ended interviews and observation checklist were used for data collection. The study population was from three selected Ethiopian higher institutions namely Jimma University (JU), Hawasa University (HU) and Wolkite University (WU). The researcher used purposive sampling and random sampling techniques to select a sample size from academic staffs and students respectively. The finding of this study shows that digital information literacy skills was very poor, across the three institutions. The study suggested that digital information literacy course should be embedded in the curriculum to enhance academic competency through collaborative approach.

Keywords: *Digital information literacy, Academic Competency, Higher Learning Institution*

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

Information and communication technologies (ICTs) have penetrated all areas of contemporary life. While in this context, digital information literacy has become much more than the ability to recognize the extent of digital information needed, access the needed digital information effectively and efficiently; evaluate digital information sources and services critically; incorporate selected digital information into one's knowledge base; use of digital information effectively to accomplish a specific purpose; and understand the economic, legal, and social issues surrounding the use of digital information access and use of this information ethically and legally (Mutula and Wamukoya, 2007).

Digital information literacy is a major component of information literacy. It helps users cope with information from a variety of electronic formats and provides techniques and methods of collecting digital resources. It creates awareness of issues like copyright and intellectual property rights in an electronic environment (Glister, 1997).

Currently, university libraries and digital learning environments is a well planned collection of services covering many issues like: social media, information literacy, professional development, and open access, the nature of the physical space, virtual reference, and e-books. According to Horton (2007) the family of the twenty-first century is described as survival literacy with overlapping connections as closely-knit and extended family portrayed in six categories: core functional literacy competencies of reading, writing, orally and numeracy; computer literacy; media literacy; distance education and e-learning; cultural literacy; and information literacy.

The origin of the word literacy refers to the ability to read and write. Early descriptions of computer related literacy's also focus on the acquisition of sets of rules and technical capabilities. However, by the end of the 20th century, this definition had expanded considerably. According to the working definition, agreed at the UNESCO June 2003 expert meeting in Paris, literacy is the ability to identify, understand, interpret, create, communicate, compute and use printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society (UNESCO, 2004).

Digital information literacy knows how to find, evaluate, use and manage information. It is part of lifelong learning and an important skill for all academic staffs and students. Digital information literacy skills allow individuals to communicate and work more efficiently by learning to locate, find, organize, communicate, evaluate and create information using digital technology. London School of Economics (2013) recognizes that digital information literacy is of paramount importance in learning, teaching and research and essential skills for students and staff.

The key components of basic literacy training include: computer basics; Internet, email, and web usage; basic software program usage; computer security and privacy; using digital devices and opportunities in technology careers.

Digital Information Literacy Competency (IDLC) is a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information. American Library Association, (1989) affirmed digital literacy forms the basis for lifelong learning. It is common to all disciplines, to all learning environments, and to all levels of education. It enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning. A digital literate individual is able to determine the extent of needed information, to access the needed information effectively and efficiently, to evaluate information and its sources critically, and to incorporate selected information into one's knowledge base, to use information effectively to accomplish a specific purpose, to understand the economic, legal, and social issues surrounding the literacy competency (American Library Association, 2003). In addition, it is important for universities to investigate the extent to which their academia and students use these resources in meeting their information and their capability in optimal use of the digital resources. It is a critical issue because of diversity/variety of digital resources which are located in different places, and they have used various technological features in their storing and retrieval systems and require different skills in recognizing, locating, accessing, and ethically use of these resources. This may provide the education unit of university with reliable evidence to plan and program the essential courses and syllabuses.

Thus, long-range goals of universities such as improving the quality of education, research and lifelong learning ability will be available. However, by changing perspective of teaching and

learning, teaching strategies have changed from traditional approach to modern and student centered. This approach increases student's motivation in learning and discovering scientific fact by engaging them in academic and research activities. For this purpose, teachers should help students by equipping them with digital information literacy, traditional or general literacy and communication abilities. Catts, & Lau, (2008) stated that information without transformation is just raw data and use of the information requires mastery of cognitive skills like critical thinking. This is depending on location, evaluation and application of information. Digital information literacy involves four elements namely, transmission, reception, transformation and access to information, which is during the process of reception to transmission and transmission to transformation (Catts, and Lau, 2008).

Therefore, the academia and students with digital information literacy skills can determine type, scope and range of needed information, access them effectively and efficiently, evaluate digital information resources critically, integrate the selected information with prior knowledge and make effective use of them for achieving specific goals.

They should know ethical rights of social, economic and legal issues of using and accessing information and developing successful strategies to search and organized information (Asgharzade, 1987). While the research-based learning, inquiry-based and independent learning is different aspects of digital literacy as stated by Mansourian (1987); which is consistent with the goals of universities.

Now a day, the number and variety of the data resources is increasing and in other side the funding of universities for providing them is limited. Therefore, careful choice of the resources for subscription is critical. This is necessary for educational system to guarantee the high quality and systematic educational programs for optimizing use of the resources. It seems that students are familiar than their professors with online information resources due to differences in preferences and capabilities of two generations but it does not necessarily mean that the capability of critical thinking and knowledge also is similar in the two generation (Mackey and Jacobson, 2005). Therefore, this study was initiated to investigate digital information literacy skills versus academic competencies in Jimma University from Oromia region, Hawassa University and Wolkite University from Sothern region in Ethiopia.

1.2. Statement of the Problem

Academic staffs and students need digital information for a variety of activities and the e-library has vast digital resources that can meet any of these purposes. There are daily explosions of digital information resources and the challenge of using these resources effectively is becoming overwhelming. Moreover, digital information literacy skill influences academic community's efficiency and effectiveness.

A number of factors influence users' access to digital information resources, including those that go beyond just the technologies available to users and the skills they have for using them (Pedro, 2007). For example, socio-economic standing as well as gender and age influence which technologies users are exposed to as part of their lifestyle, and the attitudes they have to the technologies can impact on skill development. Pedro further indicated that a new digital divide is emerging within the new generation; whereby those with higher socio-economic status are more likely to have a computer at home and access to a wide range of information and media when communicating with peers.

As digital information literacy is fundamentally gained and gauged by education, one of the major problems of digital information literacy is the knowledge of academic staffs and students. Formal training in digital information literacy is relatively rare in education programs, and ever-changing technology necessitates a continued learning on the part of teachers (Horizon Report, 2010) stated.

As faculty and instructors begin to realize that they are limiting their students by helping them to develop and use digital information literacy skills across the curriculum, the lack of formal training is being offset through professional development or informal learning, but they are far from seeing digital information literacy as a standard. This reality is exacerbated by the fact that as technology continues to evolve; digital information literacy must necessarily be less about tools and more about ways of thinking and seeing, and of crafting narrative.

Pedro (2007) claimed that teachers are unable to acquire digital information competency at a fast enough rate to remain ahead of their more technologically capable students. However, a study by Margaryan and Littlejohn (2008) found that students relied on their teachers to guide them in the

use of appropriate technologies for learning, indicating a lack of understanding by students in how to use ICTs for learning. Even though the students were competent in using technologies in social networks such as Facebook, no correlation was found in Littlejohn, Margaryan, and Vojt's (2010) four year study between the ability to use technologies in social settings, and competence in using technologies for formal university learning. However, they claim, students who perceived they had better ICT skills were more likely to favor technology-supported learning. The inclusion of digital information literacy' in the curricula is regarded by Littlejohn, Margaryan, and Vojt (2010) as important if learners are to keep up with the rapid technological change that is occurring globally.

Currently, universities highly increased electronic information through their website, institutional repository, digital library, and e-resource system. However, the usage statistics of most universities is not satisfactory. This indicates that users have no enough skill to interpret, use, and retrieve the most useful information for their need.

The digital information literacy course is not included in curriculum. That keeps the stakeholders to highly work on it. And education helps users to know what it is, how it is useful, and its effect on students teaching learning environment.

Digital information literacy is increasingly important. Higher education institutions have responded by providing instruction in digital information literacy, described as the ability to locate, manage, critically evaluate and use information for problem solving, research and decision making (Orr, Appleton, and Wallin, 2001). In developing countries like Ethiopia however, both ICT and the use of the digital information resource are still at a rising stage. The limits of the tradition way and the increasing popularity of ICT have caused the use of the digital resource to grow rapidly. Although people need no longer go to recognize, access, and share for some kinds of information, they still need help to locate the information they want.

Despite these all problem, there is no study done on DILS in Ethiopian higher institutions.

Research Questions

Five research questions were framed from the areas for identified in the call for proposals in line with the literature review and the expected outcomes for the research.

1. What digital resources are available in selected higher institutions in Ethiopia?
2. What type of digital information resources academic staffs and students use frequently in selected higher institutions in Ethiopia?
3. How do instructional initiatives affect digital information competency of the academic staffs and students?
4. To what extent does the level of digital information literacy skill affect the use of information?
5. What are the factors that affect digital information literacy skills acquisition and subsequently affecting the use of digital information resources?
6. What is the relationship between digital information literacy and academic competences?

1.3. Objectives

1.3.1. General Objectives

The general objective of this study is to investigate digital information literacy operation on academic competencies in Ethiopian higher institutions.

1.3.2. Specific Objectives

Specifically the objectives of this study are to:

1. To examine which digital resources available selected higher institutions in Ethiopia.
2. To evaluate what type of digital resources academic staffs and students use frequently in the study area.
3. To assess the effect of the instructional initiatives on the digital information competency of the academic staffs and students.
4. To assess how the level of digital information literacy affects use of resources and services.
5. To identify factors that affect digital information literacy skills acquisition and subsequently affecting the use of digital information resources.
6. To examine the association between digital information literacy and academic competency.

1.4. Significance of the Study

Digital information literacy equips the academic staffs and students with enhancing knowledge in all academic processes to empower them as future capable citizens. It helps to impart crucial knowledge about the functions of digital information channels in democratic societies, reasonable understanding about the conditions needed to perform those functions effectively and basic skills necessary to evaluate the performance of digital information providers in light of the expected functions.

The significance of this study includes the understanding of the usage of digital information resources by academic staffs and students in the selected Ethiopian higher learning institutions. Moreover, this study will attempt to identify which of the variables presented play a significant role in the academic staffs and students digital information literacy for academic competency. It is also meant to also show the problems associated with the digital information literacy and as such the result of the findings of this study will contribute to the body of knowledge on academic staffs and student's digital information literacy in higher institution in our country. Moreover, the finding of this study could also benefit academics, researchers, students and professional interested in this area of study as a baseline and reference and the results may also serve to develop a program of digital information literacy instruction at the higher institution level through the collaborative efforts of academic staffs and students.

1.5. Scope of the Study

DIL is a wide concept; however, the scope of this study is about digital information literacy (DIL) practice in universities. It was limited to DIL skills on academic performance of both staff and students of Jimma, Hawassa and Wolikite Universities in Ethiopia. Concerning the academic staff, the study was limited to staff who are on duty in all universities. Undergraduate and postgraduate students were involved.

1.6. Limitation and Delimitation of the Study

Because of scarce resources and time the researcher gathered data only from undergraduates whose status is graduating class due to their long stay in the campus and experience in searching digital information.

1.7. Operational Definition

Competency: is based learning or competency based education and training is an approach to teaching and learning more often used in learning concrete skills than abstract learning. It differs from other non-related approaches in that the unit of learning is extremely fine grained.

Academic Performance: is the meaning of academic performance is how well one does in school. Poor grades are considered bad academic performance.

Curriculum: Is the planned interaction of pupils with instructional content, materials, resources, and processes for evaluating the attainment of educational objectives

Digital Information: Digital information is information that is stored in a digital form. Most digital information is stores using a series of numbers or code called binary. And data stored on computers and in other digital media (e.g., magnetic or optical discs)

Digital Information Literacy (DIL): is the ability to recognise the need for, to access, and to evaluate electronic information. The digitally literate can confidently use, manage, create, quote and share sources of digital information in an effective way.

Digital Information Resources: are those resources whose deal with both born digital and digitized materials which can be either accessible from library's in house database or from the world-wide-web, the born digital materials includes; e-books, e-journal, e-news paper, e-magazine, thesis, dissertations, reports, website, www-resources and other related materials which can be considered necessary by the user, researcher, informational professional or even by the library management itself.

Digital Library: is an electronic library (also referred to as digital library or digital repository) is a focused collection of digital objects that can include text, visual material, audio material, video material, stored as electronic media formats (as opposed to print, micro form, or other media), along with means for organizing, storing, and retrieving the files and media contained in the library collection. Digital libraries can vary immensely in size and scope, and can be maintained

by individuals, organizations, or affiliated with established physical library buildings or institutions, or with academic institutions.

Information Literacy: is the ability to identify what information is needed, understand how the information is organized, identify the best sources of information for a given need, locate those sources, evaluate the sources critically, and share that information. It is the knowledge of commonly used research techniques.

Literacy: is the ability to read and write. The inability to do so is called illiteracy. Visual literacy also includes the ability to understand visual forms of communication such as body language, pictures, maps, and video

1.8. Organization of the Document

This research report is organized into five chapters; the first chapter covering the introduction, background of the study, the second chapter is devoted to review literatures on digital information literacy concepts and techniques, the third chapter is about how this research was conducted or what procedures were followed in order to understand the problem. It covers the methodology: sampling, the study sites, research design, data collections methods, research instruments, a brief description of data analysis and presentation. Chapter four covers the data analysis as well as the presentation and discussion of findings. The final chapter presents the conclusion in relation to the research questions of this study and recommendations.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Overview of Digital Information Literacy

Digital resources have been used to provide accurate and timely information, especially for students and academic staffs who depend greatly on the digital resources for information to boost research and collaboration with counterparts around the world for intellectual growth. Digital information is in fact very crucial for the acquisition of knowledge and development. This explains the rationale for the introduction and acquisition of digital resources in libraries around the world to facilitate scholarly communication. The literature also shows that a number of relevant studies have been carried out on the digital information literacy on academic competency by lecturers, research scholars and students worldwide.

According to Glister (1997), digital information literacy is defined as, a set of skills to access the internet; find, manage and edit digital information; join in communications; and otherwise engage with an online information and communication network. In simple terms, digital literacy is the ability to properly use and evaluate digital resources, tools and services and apply it to their lifelong learning process. The New Media Consortium (2005) stated that digital information literacy includes the ability to understand the power of images and sounds, to recognize and use that power, to manipulate and transform digital media, to distribute them pervasively and to easily adopt them to new forms. The most essential aspect of digital information literacy is the ability to make informed judgments about what is found online, unlike conventional media, much digital information is unfiltered by editors and open to the contribution of all.

Since there is little published on digital information literacy, the following definition was used as a basis to determine a comprehensive definition for digital information literacy (Gilster, 1997).

According to Sconul (2011) digital information literacy skill is an awareness of how they gather, use, manage, synthesize and create information and data in an ethical manner and will have the information skills to do so effectively.

According to Koltay (2011) digital information literacy deals with the retrieval and selection of information available. However academic staff and student needs not just to be able to search, assess and retrieve information. There is also a need for them to understand the hardware, software and applications which are involved in the storage and creation of information in order to be able to help patrons troubleshoot problems.

Hegarty et al. (2010) describe digital information literacy (DIL) as a subset of information literacy and define it as: the ability to recognize the need for, access, and evaluate electronic information. The digitally literate can confidently use, manage, create, quote and share sources of digital information in an effective way. The digitally literate demonstrate openness, the ability to problem solve, to critically reflect, technical capability and a willingness to collaborate and keep up to date prompted by the changing contexts in which they use information. Hegarty et al, (2010) concluded that digital information literacy is an evolving concept.

- The ability to understand and use information in multiple formats from a wide range of sources when resented via a computer.
- The digital information literate student will then be able to understand a problem and develop a set of questions that will solve the information need.
- Solve the problem by using search methods which allow students access to digital information sources on the Web.
- Evaluate the sources by making informed judgments about what is found online.
- Consolidate the identified resources into a broader package of information, gathered from a variety of media sources, for example the Web.
- Develop critical-thinking skills and use Web tools such as search engines, listing of favorite sites, mailing lists, etcetera.

Digital information resources have been used to provide accurate and timely information, especially for students who depend greatly on the digital resources for information to boost research and collaboration with counterparts around the world for intellectual growth. Information is in fact very crucial for the acquisition of knowledge and development. This explains the rationale for the introduction and acquisition of digital resources in libraries around the world to facilitate scholarly communication. Literature shows that a number of relevant

studies have been carried out on the digital information literacy on academic competency by lecturers, research scholars and students worldwide (Robyn R. 2014)

Digitally information literate people among others are able to determine the extent of digital information needed, access the needed digital information effectively and efficiently, evaluate digital information sources and services critically, incorporate selected digital information into one's knowledge base, use of digital and electronics information effectively to accomplish a specific purpose, and understand the economic, legal, and social issues surrounding the use of digital and electronics information access and use of this information ethically and legally.

Digital Information Literacy is a major component of information literacy. It helps users cope with information from a variety of electronic formats and provides techniques and methods of collecting digital and electronics resources. It creates awareness of issues like copyright and intellectual property rights in an electronic environment (Glister, 1997).

2.2. The Significance of Information Literacy Education

The need for digital information literacy cannot be underscored and many authors have recognized that information literacy is of crucial importance. Baro and Fyneman (2008) noted that digital information literacy is important particularly in this age because it allows us to cope with skills to know when we need information and where to locate it effectively and efficiently.

Adeogun (2006) expresses similar views by stating that the purpose of digital information literacy (DIL) education is to help students and academic to develop critical thinking and analytical skills which they will need for transforming information into knowledge. Dadzie (2009) also confirms the importance of digital information literacy by mentioning that digital information literacy has thus become one of the most vital sets of skills for the twenty first century, and therefore, everyone needs DIL skills to enable him/her to function adequately as a citizen of the community.

Idiodi (2005) also echoes the importance of digital information literacy by pointing out that the information explosion of the 20th century subsequently gave birth to the concept of digital information literacy and this in turn has gradually become a strategic issue for tertiary

institutions, where the emphasis is placed on teaching and learning strategies that deliver the skills needed by students and academic to succeed in an increasingly competitive environment.

As stated earlier, the quality, authenticity, validity and reliability of some of the materials in electronic format via the internet cannot be guaranteed, and these uncertainties are one factor in particular that makes the need for information literacy pressing (Idiodi, 2005).

Bruce, Chesterton, and Grimison (2002) have also of the same view and maintain that digital information literacy, from both national and international perspectives, is a central issue, and strategies to raise awareness and make information literacy a focal point of the academic experience within the university community should be explored and developed. They state further that computer competence and critical thinking skills are the components that give digital information literacy its unique identity and differentiate it from traditional library orientation and bibliographic instruction.

Dadzie (2009) also states clearly that some students entering college and university have limited knowledge of fundamental research and information competency skills. Dadzie goes on to mention as a reason that students may not have learnt how to effectively locate in information, or evaluate, synthesize and integrate ideas; or may not have learned how to use digital information in original work and give proper credit for information used. It is further confirmed that students who follow digital information literacy programs have fewer difficulties in writing papers; are better able to identify reliable sources and assess available resources and services provided by the library; and learn how to understand and draft bibliographical references and avoid plagiarism (Malliari and Nitsos, as cited in Dadzie, 2009).

Another important fact is that digital information literacy skills potentially enable students to succeed academically and ultimately help them also to secure future job opportunities (Dadzie, 2009).

Adeogun (2006) also shares similar views that there is the need for graduates to acquire lifelong learning skills which will not only be beneficial in education, but will help them to continue to grow even outside the classroom after their education. The researcher concludes that such skills are acquired through an educational system that enables students to develop a set of critical thinking skills involving the use of information to create meaning and the researcher adds that

building such skills requires interaction with real world digital information resources for information gathering and synthesis, and this calls for the development of digital information literacy skills among tertiary institution students.

Wurman (2001) summarizes it all by stating that without digital information literacy people are condemned to lack of information, dependence upon others for access to knowledge and information, and even to acute levels of information anxiety (Wurman, as cited in Bruce, 2004). Digital information literacy is no doubt very important in education and therefore a convenient approach must be used to teach it in order to make it more effective.

2.3. The importance of Incorporating DILS to Curriculum

The literatures published on digital information literacy skills reveal some useful and interesting findings that assist in planning, designing and implementing programs to develop as well as measure digital information literacy skills of specific user communities. A digital information literacy programs at university of Texas at Austin serve as a case study for implementing information literacy skills into traditional library services and collaborative activities (Dupuis, 1997).

An ongoing survey of information literacy competencies of graduate students of University of California- Berkeley also examines the extent of which undergraduate students are information literate (Davitt Maughan, 2001).

The result revealed that students think they know more about accessing information and conducting library research than they are able to demonstrate when put to the test.

New methods of teaching digital information literacy skills, combining with problem solving techniques, to develop, promote and assess critical and analytical thinking of students further using information technology available in the contemporary environment have also been highlighted (Macklin, 2001).

Efforts were also made to develop an instrument for measuring of digital information literacy skills of University students. This instrument will be administered to students to assess entry

skills upon admission to the University and longitudinally to ascertain whether there is significant change in skills levels from admission to graduation (O'Connor, 2002).

According to (Feast, 2003) evaluated the impact of an action plan that aimed to assist in integrating information skills into teaching and learning practices of eight first-year core business courses at University of South Australia. Content analysis and staff interviews were made to evaluate the success of the action plan. The findings showed that the action plan had not delivered the expected outcomes. (Brettle, 2003) conducted a study to undertake a systematic review of literature on digital information literacy skills to determine the effectiveness of information skills training, to identify effective methods of training and to determine whether information skills training affects patient care. Accordingly, the finding of the study by this author revealed (Brettle, 2003).

The majority of studies took place in (United States) US medical schools. Wide variations were found in course content and training methods. Eight studies used objective methods to test skills, two compared training methods and two examined the effects on patient care. There was limited evidence to show that training improves skills, insufficient evidence to determine the most effective methods of training and limited evidence to show that training improves patient care. Further research was suggested in a number of areas.

A project was conducted at the University of Melbourne during (2002) to evaluate the effectiveness of different methods adopted for teaching information literacy skills to students in the Arts Faculty.

The three programs that were evaluated used different modes of delivery. The paper discussed the rationale of the project, the methodology and the results of the evaluation (Fiona and Ellis, 2003).

The need for the training the library and information professionals in the planning and implementation of digital information literacy programmes working in Indian University libraries was emphasized by (Nyamboga, 2004).

Another study conducted in KUVEMPU University to assess the computer literacy and digital information literacy of the post graduate students revealed that majority of the students lack awareness regarding the printed reference sources, highest percent of them do not possess the

ability to identify the key concepts in the given information environment. About 44% of the respondents are unable to use computers and many of them do not possess the knowledge about software, hardware and storage devices. Significant percent of them are not able to use the Internet.

Majority opinioned that the computer literacy and digital information literacy programs are very important for them (Ramakrishna and Valmiki, 2004). These findings suggested the design and implementation of digital information literacy programs for students at postgraduate and undergraduate level and the librarian need to play crucial role in imparting digital information literacy education to students.

The importance of incorporating courses on digital information literacy skills to address the individual needs of students with disabilities for successfully meeting the academic standards for all the students has been demonstrated by (Vreeburg Izzo et al 2003).

A case study reported by (Alfino et al 2008) explains the importance of integrating library skills into course goals to add coherence to the curriculum. In the project, staffs were included in the instructional team, and information literacy skills that relate to critical thinking. Critical and philosophical arguments for constructivist based approaches to teaching critical thinking skills through online library instruction have been provided by (Allen, 2008).

Kupier et al (2008) have conducted a study on the adequacy and specific characterizes of school students' use of web literacy skills and strategies. Morgan and Walton (2008) reported how staffs and students embraced new methods of working to general library and IT inductions at higher education level. In another project by Sounders and Coles (2008), the creation of a new research interface for academic users to improve their digital information literacy suggested that the diverse information literacy practices the users demonstrated could be enhanced if on screen clarity and consistency of terminology were improved.

An investigation by Gross and Don Lathan (2009) focused on student conceptions of and experiences with interacting with information. Using interview technique the students has been assessed in terms of their digital information literacy skills. Findings revealed that a general view of digital information literacy focused on product rather than process, a perception of achieving information skills on their own, a performance for people over their information sources and an emphasis on personal interest as key to successful information seeking. Contemporary research

has also focused on digital literacy and its relationship to information literacy (Kenton and Blummer, 2010).

They suggest the application of novel educational techniques in institutions of higher education using imparting digital information literacy programmes. Librarians could develop tools to support students' interaction in course management system and virtual worlds, assist faculty in the creation of course curriculum as well as moderate online book discussions. Pinto (2010) proposed a methodology known as creating concept maps what helps in diagnosing and improving information analysis, synthesis, organization and representation skills and competencies of students. These authors have tested its usefulness using action research methodology on a group of university students of library and information Science. This method provides information on the strengths and weakness of the students' skills, thus enabling their training to be improved by means of specific actions.

2.4. Digital Information Literacy in Higher Education Institutions

Digital information literacy, often confused with digital skills by large commercial interests, has grown both as an idea and a focus of interest for higher education institutions (HEIs), as the so-called web 2.0 has evolved. 'Web 2.0' may now be obsolete due to its pervasiveness, but digital literacy has yet to make a significant impact on the way that higher education operates.

The range and extent of digital information literacy education in HEIs is hard to assess as it is primarily embedded and therefore hidden. One consequence of digital information literacy being below the radar is that it is not well developed in HEIs because it is not an explicitly articulated requirement. Developing Digital information literacy's programme suggested that this is the case. Many programmes of study, particularly in post-1992 universities, include the teaching of some aspects of IT skills, driven by influences such as the Leitch report (1996) and Quality Assurance Agency (QAA) benchmark statements, but few concentrate on the full range of digital tools or the full range of 'literacy' skills, and there is often poor embedding of literacies into the curriculum, particularly at the level of feedback and assessment (Beetham et al. 2009).

Manchester Metropolitan University MMU (2009) a quick trawl of HEI websites reveals that, typically, IT services provide software training and libraries provide information literacy training.

2.4.1. Students Digital Literacy Skill when Joining University

Many students arrive at university believing they are skilled IT users but there is a substantial body of evidence that indicates they underestimate the range of skills that are important, overestimate the extent of their skills base and are completely unaware that ‘driving the software’ is only part of the story (Redecker et al. 2009).

At Manchester Metropolitan University (2009) business school they ran a school wide first year unit developing digital literacy to prepare students for the rest of their degree. Anecdotal evidence revealed many gaps in their ability to find, analyse, evaluate and present digital information.

This study revealed that students were unaware of the use of quotes or Boolean operators in Google, could not use even simple functions in excel, were not able to identify reliable sources of data on the web and could not use styles to consistently format a document. And yet, despite huge efforts to make this module flexible, interesting and stimulating, it has been dropped because students did not see its relevance and importance.

This supports the point made by Beetham et al (2009) that digital information literacy education needs to be situated in authentic, relevant tasks. They would add that these tasks also need to be aligned with core content. However, such an approach relies on the literacy skills of the teaching staff Mcgonigle et al. (2010) and a deeper understanding of the wider benefits of digital information literacy (Beetham et al. 2009).

Reviews suggested that such skills and awareness are not widely present at Manchester Metropolitan University (2009) and there is no reason to suspect that this is peculiar to MMU.

2.4.2. The Need to Upgrading Digital Literacy Skill of University Community

However, the upgrading of staff IT skills is a tricky change management problem given the person culture of universities Handy (1985) which encourages self-managed and self-guided behavior. The e-skills UK report (2009) estimates that 77% of jobs require IT skills but academics routinely discount this as being part of their responsibility because of the transitory nature of such skills.

Arguably, it is the transitory nature of many digital skills and the increasing pressure to support employability that creates a mandate to give students lifelong learning skills that will support their ongoing professional development in a changing technological environment.

An important aspect of any assessment is the ability to distinguish levels of achievement. While not articulated as criteria for student assessment, the authors believe that the three levels of literacy outlined by the Martin and Grudziecki (2006) provide a useful measure of overall achievement that can be applied to students' work. Level 1 includes digital competence (skills, concepts, approaches, attitudes, etc.) level 2 covers digital usage (professional/discipline application) and level 3 expects digital transformation (innovation/creativity).

2.4.3. Digital Information Literacy verses Academic Productivity

In an assessment of the relationship between digital information literacy skills and information for academic or research, the Purdue online writing lab as cited by Igbo (2008) argued that it is necessary for one to decide where to look, what clues to search for and what to accept especially now that they are faced with staggering quality of information.

Armstrong (2005) asserts that understanding availability of resources requires the researcher to have the ability to identify what resources are available, for exploitation, where they are available, how to access them, the merits of individual resource, type and when it is appropriate to use them. This may have great implication for researchers. There is therefore the need to determine how it affects academic staff and student's productivity.

Apart from the need to access digital information, academic staff and student also has the need to evaluate the accessible information. Dillon et al as cited by Igbo (2008) asserts that as the availability of information increases, there is a growing need for skills not only in accessing information but also in assessing critically its validity. This involves evaluation which is the determination of the merit or significance of the information or source. Evaluation is often used to characterize and apprise subjects of interest in a wide range of human enterprise, governments, education, information etc. Basically, evaluation according to Armstrong (2005) involves the ability to evaluate information for its authenticity, accuracy, currency, value and bias. It also involves the ability to evaluate the means by which the results are obtained in order to ensure that the approach used does not produce misleading or incomplete results in academic research.

Evaluation of information and its sources is an important skill needed all the time for research. According to Ormondroyd (2004) learning how to determine the relevance and authority of a given resource is one of the core skills of the research process. This position is very important for this present research which seeks to determine the influence of information literacy skills as academic staff productivity.

On the role of awareness and ability to use information resources, the American Library Association (ALA) (1989) affirms that information literacy can only be fostered if textbooks, workbooks and lecture, can give way to a learning process based on information system and resource. Information awareness here according to CILIP (2005) involves the ability to recognize the information needed, understanding why information is needed, what information are required as well as associated constraints.

These skills are necessary for research hence this present study tries to find out how it affects productivity. Writing on e-learning in a virtual world in the Navy and its relationship to information literacy (Brynjolfsson, 1996).

He concluded that IL skills initiate, sustain and extend lifelong learning and complement the aggressive work underway throughout the department to become a knowledge centric organization and achieve knowledge superiority. There is a between an individual's understanding and the ability to access what he needs from the external environment. Digital information literacy, providing what could refer to as meta information (or information about information), helps close that gap and provides ways of increasing an individual's ability to access what they need from the external information environment.

George et'al cited in Igbo (2008), assert that curriculum based approaches and the professional development of teaching staff in information literacy recognize the highly technical nature and increasing complexity of the Information age. The roles of teaching staff, librarians and other support staff including those in student support and professional development will need to be reconceptualised to ensure that the strengths and skills of each group are coordinated to contribute to the desired productivity.

Relationship of information literacy on the teaching and learning in South Australia, they argue that the University of South Australia's approach to information literacy in the context of

lifelong learning is situated within a broader teaching and learning strategy. The university has taken a particular approach in responding to the changes in the more general social and economic climate. Institution wide planning and development processes are directed by a set of curriculum outcomes the seven qualities of a University of South Australia graduate and by student centered approaches which foster student access to and control of their learning processes.

In recent years, the relationship between information technology and productivity has become a source of debate. According to Brynjolfsson et al. (1996), empirical research associated with information technology, generally, did not significantly improve academic productivity. They argued further that most recently, as new data are identified, and new technologies are applied, several researchers have found evidence that information technology is associated not only with improvements in productivity, but also in intermediate measures and economic supply. This survey reviews the literature, identifies questions and concludes with recommendations for application of methodologies to new data sources, as well as alternative, broader matrix of welfare to assess and enhance the benefits of information technology.

2.4.4. Digital Information Literacy Skills for Academic Competencies

According to Sconul, (2011), information literate people will demonstrate an awareness of how they gather, use, manage, synthesize and create information and data in an ethical manner and will have the information skills to do so effectively whereas, according to Koltay (2011) information literacy deals with the retrieval and selection of information available.

However, library staff need not just to be able to search, assess and retrieve information. There is also a need for them to understand the hardware, software and applications which are involved in the storage and creation of information in order to be able to help patrons troubleshoot problems.

Hegarty et al. (2010) described digital information literacy (DIL) as a subset of information literacy and define it as the ability to recognize the need for, access, and evaluate electronic information. The digitally literate can confidently use, manage, create, quote and share sources of digital information in an effective way.

The digitally literate demonstrate openness, the ability to problem solve, to critically reflect, technical capability and a willingness to collaborate and keep up to date prompted by the changing contexts in which they use information.

Hegarty et al (2010) concluded that digital information literacy is an evolving concept. For the purposes of this study the definition given by Hegarty et al. (2010) would appear to be the most useful, coming as it does from a New Zealand context. The broad scope of the definition, including aspects such as usage, technical ability, creation, problem solving and collaboration is the most descriptive of the range of operations carried out at NZ public library front desks.

Much has been made of the concept of core competencies or lists of specific skills which are perceived by authors to be critical skills for library staff. Eells and Jagusewski (2008) described the development of a set of core IT skills at the University of Minnesota. Skills are using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate and create information in order to function in a knowledge society and sharing and troubleshooting. Gutsche (2009) provided an exhaustive list of competencies for every area of librarianship, from acquisitions, to personal skills, technology skills and more.

Thompson (2009) described core competencies as the underlying understanding which enables users to build skill sets, and suggests they be written into job descriptions. Houghton-Jan (2010) described skills lists as a moving target changing every month or two and recommends yearly reassessment of lists, at variance with Thompson's suggestion they be written into job descriptions. Lists of specific competencies whilst useful as a needs assessment tool could be viewed as a narrow and prescriptive approach to digital information literacy skills.

Rapid development and adoption of emerging technologies ensures that the goalposts will always be shifting with respect to lists of competencies, and that such lists will become ever longer. A concern with this approach is that some staff may not respond accurately, as they may not feel confident with technologies, and may not wish to appear less able than others.

Farkas (2006) is much nearer the mark with her very broad categories she described the ability to embrace change, comfort in the online medium, ability to troubleshoot new technologies, ability

to easily learn new technologies and ability to keep up with new ideas in technology and librarianship (enthusiasm for learning).

The beauty of these broad categories is that they can be applied to any level of staffing, from frontline to management and are more of a big picture approach than detailed lists. These big picture categories would be more appropriately added to job descriptions and recruitment strategies. Hegarty et al (2010) found that capabilities rather than check box skills are fundamental, echoing Farkas's message.

2.5. Preferences of Digital Information Sources

In order to get relevant information on preferences of information sources by students and academic staffs, there was the need to broaden the search to cover other areas like information needs and behavior of different user groups such as academics, researchers, postgraduate students and undergraduates.

Mittermeyer and Quirion (2003), reported in a study of incoming first year undergraduate students in Quebec that many students used the internet extensively to find course-related information. In another study conducted in the University of Botswana by Fidzani (1998), it was established that graduate students relied heavily on library books, textbooks and journals as sources of information used for course-work.

Kerins et al (2004), in another study of undergraduate engineering students reported that the majority of the students indicated that the internet was the first source of information they used for a project, course assignment (Kerins et al, as cited in Baro and Fyneman, 2009).

Another study of first year undergraduate students reported that all of the participants felt that they had little need to look for information outside what faculty provided for them in their courses, and where information was needed they felt they were able to acquire it using general search engines (Seamans, 2001). It was also found that student participants were comfortable using technology to learn and that web-based modules could be used in the future to teach library instruction.

Two other studies conducted differently by George, Bright, Hurlbert, and Linke (2006) and Vezzosi (2008) also showed that both Master and Doctoral students rely heavily on the internet for their research work, but they also consulted the physical library for their information needs.

2.6. Conceptual Framework

A conceptual framework is a model on how one theorized or made logical sense of the relationship among the several factors relevant to the problems being studied. The variance in the dependent variable was academic performance which could be explained by the five independent variables namely searching skill, evaluating skill and referencing skill using digital technology from the components of information and digital literacy. The framework of this study is shown on Fig. 2.1 and 2.2.

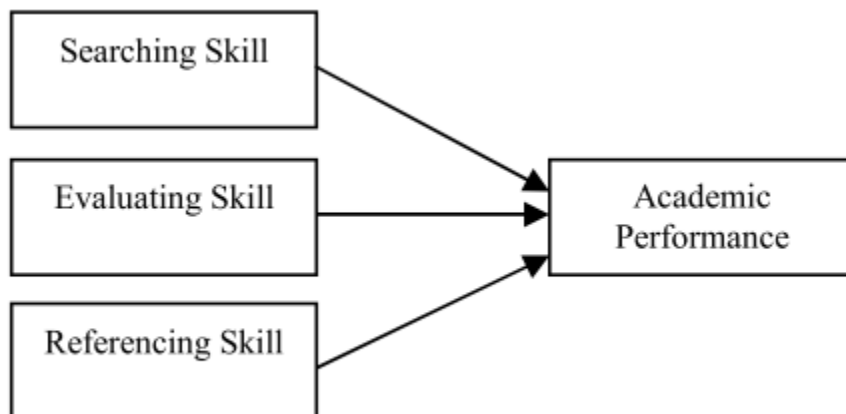


Figure 2.1. Conceptual framework (Mohd I. and Raja A, 2011)

Conceptual framework of digital information literacy through the integration of different types of literacy that may help us to understand the different types of skills contained within the concept digital information literacy. This study defines digital information literacy in terms of a growing variety of technical, cognitive and sociological skills, necessary to perform tasks and solve problems in digital environments (Aviran, Guirion and Esthet-Alkalai, 2006).

The framework we use is adapted from Rhona Sharpe and Helen Beetham's 'Developing Effective E-Learning: The Development Pyramid' (2008) which describes the development of digital literacy's in terms of access, skills, and practices as prerequisites to becoming a critical, informed, expert user of digital technologies.



Figure 2.2. Conceptual Framework Adopted from Rhona S. and Helen B. (2008)

This is where the real value of work placements lies in bridging the gap between students’ learning and how this is applied in a work environment, and in making that connection in the student’s mind, too, so that they are digitally ready and so that they have the awareness and the ability to articulate that readiness in order to make stronger applications, perform better in interviews, and, ultimately, better able to do their jobs. Developing those higher-level attributes and attitudes digital information literacy’s requires reflection. Cindy and Hannah (2008) spoke about the ways in which they encourage students to reflect on their placement experience and how this is linked to assessment, which surely then have to be based on students’ ability to draw out and illustrate their learning and development rather than a descriptive account of, say, the academic activity or their day-to-day tasks while on placement.

Cindy finally comments were twofo2ld: firstly, to encourage anyone involved in planning, assessing and evaluating placements to consider what digital opportunities might be embedded in them. And secondly, to consider whether the development pyramid might be applied to planning,

assessment and evaluation of academic work placements more generally, not just to look at the digital angle. After all, having the right tools for the academic work, learning how to use them and knowing what to do with them, are the building blocks required to develop any sort of expertise. Thus the development pyramid might provide a useful framework for designing digital information literacy for academic activities.

2.7. Delivery of Digital Information Literacy Skills

Research so far indicated that tailored delivery packages are more effective than off the shelf models. King, McMenemy and Poulter (2006) report on a survey of staff reactions to a UK wide ICT training programme (European Computer Driving Licence, (ECDL)). The Findings revealed that 91% of staff responding either had or were receiving the training, and although relatively effective, there were some drawbacks to using an off-the-shelf package. Notably, the lack of trouble shooting training was highlighted the ECDL being seen as more of a how to programme. Respondents recognized that some of the most effective training was by trial and error whilst solving queries for customers, and that there was a need to follow up formal training with time to practice skills learnt. However, training in the basics did give staff the confidence to problem solving, and a set of skills to build on. In their conclusions the authors noted the need for a tailored package to deliver ICT skills to frontline library staff.

Eells and Jagusewski (2008), described the assessment process used in 2005 by the University of Minnesota to develop a training package for their 300 plus library staff. A staff task force was formed which evaluated the existing training programme. Lists of core competencies to identify real as opposed to perceived training needs amongst staff were developed. Much effort was put into achieving staff buy in during the process of identifying competency lists. Results from these reports were used to identify organizational training strategies and individual performance appraisals. Whilst the authors found much to recommend in the process used, it was notably both time consuming and labour intensive.

Blowers and Reed (2007) took the process one step further and described the programme developed by them at the public library of Charlotte and Mecklenburg County in the USA, consisting of four levels of core competencies Core I (basic competencies of hardware and software knowledge, Internet, email and word processing basics). Core II (competencies utilized

in assisting the public) Core III (specialized location dependent software competencies e.g. computer booking system) Core IV (audiovisual set up, public technology training skills). Building on this they developed a learning programme based on Web 2.0 skills named learning 2.0, which is online, self paced learning with an emphasis on fun. Whilst very little quantitative data is provided by the authors regarding efficacy, the completion rate by staff and adoption by a number of other libraries attest to the workability of the approach used.

Training programmes may be delivered by a number of approaches. Houghton (2010) detailed these as follows: 23 things (a self paced exploration of any one specific technology, commonly Web 2.0, but can be troubleshooting, of MS Office tips and tricks) peer training, lunchtime sessions, technology petting zoo (opportunities to experiment, play with and learn new technologies in a one-off training day), online training and train the trainer. Both Blowers and Reed (2007) and Houghton-Jan (2010) report favourably on the use of incentives to encourage participation in staff training initiatives. Hegarty et al. (2010) in New Zealand study sponsored by the Ministry of Education, and various New Zealand tertiary level institutions, reported considerable success using supported and collaborative learning and the ability to play.

According to the New Zealand Digital Strategy (Ministry of Economic Development, 2008), there is an urgent need for the key players in a digital future i.e. learners and teachers. This phenomenon was eloquently stated by Marshall (2006): Critically, capability included the ability of an institution to sustain digital information delivery and the support of learning and teaching as demand grows and staff change.

2.8. Approach to Digital Information Literacy Education

It is worth noting that digital information literacy education or instruction may be approached differently either as a course-related library instruction, course integrated projects, online tutorials or a standalone course. However, the best approach is that which integrates information literacy into the curriculum ACRL, as cited in (Adeogun).

According to Dadzie (2009) a number of authors share in the opinion that the ideal method for enabling students to develop their digital information literacy skills is by embedding the digital information literacy activity into the student's course materials. This opinion is shared by authors

like (Cmor (2009), and (Hook and Corbett 2004). Cmor (2009) states clearly that building a curriculum-integrated information literacy programme that provides students the opportunity to learn, practice, and refine their skills and knowledge throughout their programmes is a worthy goal in higher education.

Hook and Corbett (2004) also agree and emphasize it by mentioning that because digital information literacy is not discipline specific, students are able to transfer skills and research techniques from one course to another, and mostly for that reason, implementing digital information literacy across the university curricula should receive greater attention and focus. They further state that it is important to constantly keep in mind that information literacy is really for the students and it must be incorporated in the curriculum in a way that will encourage students to see the value of using it in their academic studies.

One reason cited in support of this method of teaching digital information literacy is the that it allows digital information literacy to be delivered in the context of the subject students are studying, as well as consolidating the partnership between librarians and teaching faculty in providing DIL training (Dadzie, 2009).

Korobili, Malliaria and Christodoulou (2009) are equally convinced that a course for credit integrated in the curriculum of each department which would be prepared by faculty in cooperation with librarians would provide the necessary knowledge for students so that they could operate in the emerging information environment Kinengyere (2007) also supports the idea that digital information literacy course should be embedded in the curriculum: DIL should be included in the respective universities curricular so as to give it more emphasis and this will make all researchers an potential researchers and other library users realise the importance of being digital information literate.

Cochrane (2006) agrees with other authors and states that ideally, DIL should be embedded into degree pathways and students offered the opportunity to develop their competence as they progress through their degree. These ideas show to some extent the significance of digital information literacy course and it must therefore be given the needed attention to make it more effective.

2.9. Challenges to Digital Information Literacy Education

The researcher sharing views on making digital information literacy a success, Kinengyere (2007) mentioned that helping people become information literate is a responsibility of all stakeholders, whether they are librarians, lecturers, or administrators. It involves all disciplines that are involved in research and teaching in an institution. Ideally, administrators support DIL goals for their institutions. Course instructors help their students achieve DIL in their chosen fields, and librarians and other campus professionals collaborate with course instructors in this effort.

Kinengyere (2007) identified that digital information literacy course has not been embedded in the curriculum and sees it as one of the challenges to information literacy education. She states that not embedding information literacy education into the curriculum, will not give it more seriousness. She also mentions that limited knowledge in ICT can influence greatly the development of digital information literacy programs.

Lwehabura and Stilwell (2008) mentioned that there is no dedicated DIL policy to guide DIL practices, and also there is lack of awareness among students and faculty about the DIL instruction sessions on offer.

They identified these challenges among other challenges such as lack of proactively by librarians, lack of partnerships between librarians and teaching staff to mainstream DIL, availability of resources, all these weaken the effectiveness of imparting DIL knowledge and skills.

2.10. Digital Information Literacy Skill Gaps

Both Brookes (2009) and Cherrie (2009) have identified skill gaps with respect to digital information literacy skills amongst NZ public library staff and have identified further training needs in this area. The Library and Information Association of New Zealand included information and communication technologies in its continuing professional development scheme under 'body of knowledge' application of information and communication technologies to library and information products and services.

Cherrie (2009) considered that the book scheme is not sufficiently rapid to up skill the existing workforce to the level required. He argued for a continuous, effective, available, work-based

learning around agreed skill sets. Chawner (2008) in a survey on information managers described barriers to technology adoption in New Zealand as falling into three categories institutional, technological and personal. The research examines how these barriers affect frontline library staff. The gap in access to digital tools and skills is wide and troubling. This new era poses major challenges to the flow of news and information people depend on to manage their complex lives.

Scholar Howard Besser (2000) contends that the digital divide is more than just a gap between those who have access to technology and those who don't. This issue encompasses aspects such as digital information literacy, appropriateness of content, and access to content digital disparity gaps, including: effective use of information, the ability for an information user to be more than a passive consumer, and the availability of relevant, useful, appropriate, and affordable content. Beyond access, a digital divide exists between those who apply critical thinking to technology or not, those who speak English or not, and those who create digital content or merely consume it.

2.11. Information Literacy Interventions in Africa

Baro, Emmanuel E.; Keboh, Tarela (2012), A survey of five leading university libraries in Africa showed them mainly practicing IL training by means such as library tours/orientation sessions, introductory information skills classes, and teaching advanced information skills (e.g. database searching). There are, however, many barriers: a lack of interest by students, professors, and library management; inadequate human resources to teach IL; lack of facilities; low use of distance education for teaching IL, and an absence of IL policies. These respondents argues that university authorities in Africa and other developing countries must see the need to provide the necessary facilities such as: computers with Internet connectivity in university libraries, regular power supply, training for librarians on IT, and most of all, librarians should collaborate with other stakeholders in their institutions to ensure IL policy formulation and implementation in their institutions.

Lwehabura and Stilwell (2008) reported that the acquisition of adequate IL knowledge and skills among information users is a fundamental issue because competent information users are empowered and enabled to become competitive in using information in the global information age. Through IL, information users also acquire lifelong learning skills.

Ojedokun (2007) asserted that information literacy has not been accorded its position in the higher education curricula in Africa. According to Ojedokun, (2007), information literacy skills acquired, especially during the tertiary education training, are very useful for knowledge-based development and lifelong learning, even long after they would have left school.

Rasaki (2008) in his comparative study of credit earning information literacy skills courses of three African universities revealed that only little emphasis is placed on computer and technology skills at Federal University of Technology, Akure and Lagos State University all in Nigeria. The reason given is that courses are out-of-date, and were created when the emphasis was mainly on library literacy.

Baro (2011) conducted a study on information literacy education in library schools in Africa to ascertain whether librarianship is taking the leading role in the development of information literacy in the universities. The study revealed that only few library schools have successfully integrated an information literacy course as a stand-alone course in their curriculum. Problems such as lack of personnel and facilities were mentioned in that study as obstacles to the integration of IL course in the curriculum.

Agyen-Gyasi (2008) in his study identified some problems facing the user education programme at the Kwame Nkrumah University of Science and Technology (KNUST) Library Ghana. They are students' apathy to user-education programmes, lack of personnel in the libraries, training need of librarians, irregular internet connectivity and financial constraints.

Similarly, Sitima-Ndau (2010) reported on the information literacy programme at the Chancellor College, University of Malawi that the library's information literacy programme equipped students with sufficient skills, but facilities to surf the internet are too limited. The author observed that many students are not adequately computer literate when they started their studies at Chancellor College. Other problems such as electricity failure, service charges for using the internet were identified. However, the author added that majority of the students were happy with the content and delivery of library, information and internet skills courses. This may be why Baro and Asaba (2010), in their study on Internet connectivity in university libraries in Nigeria, stated

that for university libraries to deliver effective and efficient services to its clients including information literacy programmes, they must all have stable internet connectivity in their libraries.

Writing on the user education programme at the University of Ghana Dennis (2004) identified inadequate number of qualified staff to instruct students during orientation, and inadequate time allocated to the programme as some of the challenges facing the programme.

Similarly, Dadzie (2007) in her study on information literacy: assessing the readiness of Ghanaian universities identified a number of problems hindering the implementation of IL programmes at university of Ghana and University of Cape Coast. They are lack of university commitment to the project, inadequate information about what IL is, unwillingness of the various departments already handling components of the IL programmes to collaborate with each other to form a campus-wide project, unwillingness to accept innovations in curricula planning, inadequate technological infrastructure/computers, inadequate electronic resources and inadequate human resources.

In like manner, Lwehabura (2008) identified a number of factors hindering the IL delivery in Tanzania universities. They are lack of clear IL policy, inadequate time, the teaching of IL as a stand-alone course on a voluntary basis and non-involvement of teaching staff. Similarly, Lwehabura and Stilwell (2008) pointed out that, to a large extent, IL instruction is weak in terms of its effectiveness in imparting IL knowledge and skills in Tanzania. Among the reasons given are there is no dedicated IL policy to guide IL practice; there is a lack of awareness among students about the IL instruction sessions; instruction sessions are affected by time constraints because IL is not allocated official time university academic timetables; attendance by students is voluntary and as a result not all students take advantage of the sessions that are in place; there is lack of resources such as computers and CD-ROMs to support hands-on-practice; and information skills sessions are not integrated into the curriculum.

Kavulya (2003) observed that there is failure on the part of librarians to push IL to the fore as a function of the university library. Somi and De Jager (2005) in their study revealed that while there is some evidence that the University of Fort Hare Library in Ghana is engaging in

information literacy activities, students still have difficulty in finding, critically evaluating and using information.

In South Africa, the Library and Information Association of South Africa (LIASA) has since started to address how best to lobby for the integration of IL in the curriculum. Good progress has been made by drawing on policy directives for advocacy purpose and to position libraries as partners with academics in the teaching and learning process, making explicit the links between information literacy, graduate skills and lifelong learning (De Jager and Nassimbeni, 2005).

In Botswana, the University of Botswana Library (UBL) in its project proposal admitted that, information literacy skills are fundamental to the students' academic life on campus as well as adult life, being part of the lifelong learning process.

Kavulya (2003) stated that, information literacy skills are essential for successful university study as well as for career development. According to Kavulya (2003), new university students are reluctant to use electronic sources, the main reason being a lack of databases search skills, lack of awareness of what to expect, and what assistance these services are capable of providing. The most remarkable development in IL efforts in Kenyan universities is the communication skills course for undergraduate students regardless of their subject specialization. Kavulya (2003) states that, students are taught a variety of skills including library, reading, as well as writing skills in the course. According to Kavulya (2003), the communication skills course is designed to assist new university students to become familiar with the necessary skills associated with university academic work.

2.12. The Status of Digital Information Literacy in Ethiopia

According to Abebe Chekol (2013), like many countries, the status of digital information literacy in Ethiopia does not have sufficient digital literacy for supporting digital economy and knowledge economy activities. However ICT training is becoming more and more important as the demand of computer literacy and knowledge of data processing and application skills increasing. Unfortunately, ICT training seems to be the most important activity given emphasis in Ethiopia.

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Description of the Study Site

Currently there are 33 public universities operating in different parts of Ethiopia. Those universities are classified in to three generations based on their establishment period. Out of the 33 universities, 12 were established recently and they are in the course of developing electronic and digital resource. Eleven of them are relatively well experienced on developing and using electronic digital resource and advanced on the use. The remaining ten of them are more experienced in using electronic digital resource and relatively more advanced than the second group on the use.

Therefore, three universities were purposively selected from the above mentioned generations, one from each. The choice was made based on their level of using Electronics and Digital Resource (EDR) applications and their proximity to the researcher's home institution, Jimma University. Accordingly the selected universities were Jimma University (JU) from First generation, Hawasa University (HU) from second generation and Wolkite University (WU) from the third generation.

Jimma University is one of the public higher education institution established in December 1999 by the amalgamation of Jimma College of Agriculture (founded in 1952), and Jimma Institute of Health Sciences (established in 1983). The two campuses are located in Jimma city 352 K.M. South West of Addis Ababa Oromiya region, Jimma Zone. Jimma University is the only university in Ethiopia with its education philosophy, innovative community oriented education. Currently, the university has 72 MSc programs, 9 PHD programs and 9 specialties in different fields of study (JU, 2014).

Hawassa University (HU): is another public university it was established at Hawassa in April 2000. Since 1976 the different colleges of HU had been operational starting with the college of Agriculture. The University has been formed by merging three colleges in Southern Ethiopia: Awassa College of Agriculture (ACA), Wondogenet College of Forestry and Dilla College of

Teacher Education and Health Sciences. The main Campus and several Faculties located in Hawassa city, 270 km south of the capital Addis Ababa. At this moment, the university has 17 MSc programs, and undergraduate programs in different fields of study (HU, 2014)

Wolkite University (WU): is also one of the public universities established in October 2008, and is located in South Nations and Nationalities Peoples Regional State (SNNP), Guraghe zone, Wolkite city, at a distance of 152.7 km from the capital Addis Ababa. Wolkite University has currently 7 colleges 28 Undergraduate programs in different fields of study.

3.2. Study Design

The study design used for the study was using questionnaire consisting both close and open ended items for mixed method design, thus both qualitative and quantitative approaches for data collection and subsequent analysis. “Mixed methods design is formally defined as the class of research where the researcher mixes or combines quantitative and qualitative techniques, methods, approaches, concepts or language into a single study” (Johnson and Onwuegbuzie, 2004).

3.3. Study Population

The study population is undergraduate students (graduate class), postgraduate students and academic staffs of the three universities in the academic year 2013/2014 of Jimma University (JU), Hawasa University (HU) and Welkite University (WU). The total population size listed in table 3.1.

Table 3.1: List of study population academic staff and students of the study sites (2014 G.C)

No	University	Under graduate (Graduate Class)	Postgraduate	Academic Staff	Total
1.	JU	3756	1290	1210	6256
2.	HU	3533	1275	811	5619
3.	WU	70	0	167	237
Total		7359	2565	2188	12112

Source: Ministry of education statistics annual abstract. November, 2013/2014 E.C

3.4. Sampling Technique

Stratified random sampling technique was used to determine the number in each university, and the number in the category of undergraduate, postgraduate and academic staff's categories. Accordingly, the samples were taken from the study population as source of information from undergraduate (graduating class) randomly selected and proportionally constituted 61.2%, from postgraduate students randomly selected and proportionally made up 17.8% and from academic staff randomly selected and proportionally comprised 21%.

3.5. Sample Size Determination

The total populations identified for this study formed 12112. From this total number of populations 7359 were undergraduate students (graduating class), 2565 were postgraduate and 2188 were academic staffs. Three hundred seventy one (371) respondents from faculty staffs and students was the sample size of the study. The study sample size was determined using a sample size determination formula, which is as follows:

So, the sample size was determined using the statistical formula given below:

$$n = \frac{n_0}{1 + \frac{n_0}{N}} \quad \text{Where } n_0 = \frac{Z_{\alpha/2}^2 pq}{d^2} \quad (\text{Kothari, 2004})$$

Where n = sample size	$\alpha = 0.05$
$d =$ margin of error	$q = 1 - p$
$N =$ total number of students	$q = 1 - p$
$p =$ proportion of population	$p = 0.5$
$\alpha =$ level of significance	Where: $d = 0.05$

$$n_0 = \frac{(1.96)^2 \times 0.5 \times 0.5}{0.05^2} = 384$$

Accordingly the sample size formula the sample size the sample proportion is as follow

$$n = \frac{384}{1 + \frac{384}{12112}} = 371$$

Sample size allocation (proportional allocation)

$$n_1 = \frac{n * N1}{N}, n_1 = \frac{371 \times 6256}{12112} = 192 \quad \text{From Jimma University}$$

$$n_2 = \frac{n * N2}{N}, n_2 = \frac{371 \times 5619}{12112} = 172 \quad \text{From Hawasa University}$$

$$n_2 = \frac{n * N2}{N}, n_2 = \frac{371 \times 237}{12112} = 7 \quad \text{From Wolkite University}$$

According to the sample size formula the sample sizes the sample proportion.

Jimma University

$$n_1 = \frac{n * N1}{N}, n_1 = \frac{192 \times 3756}{6256} = 115 \quad \text{From undergraduate students}$$

$$n_1 = \frac{n * N1}{N}, n_1 = \frac{192 \times 1290}{6256} = 40 \quad \text{From postgraduate students}$$

$$n_2 = \frac{n * N2}{N}, n_2 = \frac{192 \times 1210}{6256} = 37 \quad \text{From academic Staff}$$

Hawasa University

$$n_1 = \frac{n * N1}{N}, n_1 = \frac{172 \times 3533}{5619} = 108 \quad \text{From undergraduate students}$$

$$n_1 = \frac{n * N1}{N}, n_1 = \frac{172 \times 1275}{5619} = 39 \quad \text{From postgraduate students}$$

$$n_2 = \frac{n * N2}{N}, n_2 = \frac{172 \times 811}{5619} = 25 \quad \text{From academic Staff}$$

Wolkite University

$$n_1 = \frac{n * N1}{N}, n_1 = \frac{7 \times 70}{237} = 2 \quad \text{From undergraduate students}$$

$$n_1 = \frac{n * N1}{N}, n_1 = \frac{7 \times 0}{237} = 0 \quad \text{From undergraduate students}$$

$$n_2 = \frac{n * N2}{N}, n_2 = \frac{7 \times 167}{237} = 5 \quad \text{From academic Staff}$$

3.6. Data Collection Method

In order to meet the objectives of the study and to answer the research questions, the researcher used self-administered questionnaire, interview and observation. The questionnaire was distributed to the academic staff and students where as the interview was applied to ICT and Library head in order to get valuable information on the area. Questionnaires, semi-structured interviews were carried out with library director and ICT heads of each university. Observation was done to supplement the quantitative results.

The questionnaire was tested and validated by the academician of the university to know understandability of the items included in research questionnaire. Some questions were modified based on the recommendations before the instruments use for the data collection purpose. Since the respondents are familiar with the English language, the questionnaire was prepared in English language.

3.7. Research Instruments

In order to carry out a quantitative and qualitative study, the researcher used both questionnaires and interviews were used as research instruments to collect both quantitative and qualitative data for the research. In addition to closed ended questionnaire, interviews were conducted as it allows participants to discuss their opinions, views and experiences fully in detail where as mere set of interview with closed ended questions may inhibit them to express their full opinions and feelings. Moreover, structured interview and observation check list were also used as instruments

3.7.1. Questionnaire

A self-administered questionnaire was chosen as the main data collection method for this study because it provides an effective way to collect large amounts of quantitative data in a short period of time. The questionnaire provided data on investigation of digital information literacy skills on academic competencies of students and academic staffs in selected higher institutions in Ethiopia.

3.7.2. Interview

Interview was designed to cover all five research questions. The interview was developed with 8 questions that addressed Investigation of digital information literacy skill of academic competence. Interview was conducted with library directors and ICT director in all the three

selected higher learning institutions to gain in-depth data about digital information literacy skills. The interview was designed to be conducted within a time frame of 30 minutes and the researcher used English language, the interviews were recorded on tape and then transcribed for analysis.

3.7.3. Observation

Observation is the third instrument that was used as it helps to gauge their availability, structure of digital information resources in the institute, to collect data on investigating digital information literacy skills on academic competency on Ethiopian higher learning institutions.

3.8. Pre-test

A pre-test study was done to test their reliability and validity. The pre-test would assist to make all the necessary changes and corrections before the actual data collection. 5.4% (20) respondents were selected for the pre-test study from the total sample size. Five (5) of them were taken from faculty staff, five (5) from postgraduate students and the remaining ten (10) were taken from undergraduate students. Only fifty (15) out of the twenty (20) questionnaires were completed fully and returned. Various comments and suggestions were received from some of the respondents and the necessary modifications were made in some of the questions to clarify any ambiguity. Specific modifications were made to questions regarding understanding of digital information literacy skill, competency to digital information literacy, and respondent's preference of information source.

3.9. Method of Data Analysis

After collection of raw data by using questionnaire, interview, and observation; the data was organized, processed and analyzed. With the modifications for the qualitative part, significant statements and phrases pertaining to the phenomenon being studied were extracted from each transcript. Meanings were then formulated from the significant statements. Then the meanings were organized into themes, and these themes evolve into theme clusters, and eventually into theme categories. Then, the researcher scripted a rich and exhaustive description of the experience and opinions formulated.

For the quantitative data collected using questionnaire, the data were encoded, cleaned, processed and analyzed using SPSS software version 20 and the result is presented in tables, graphs and charts, frequency, and percentage. Also the researcher used inferential statistics such that ANOVA, and Chi-squer a 5% significant confidence level.

3.10. Data Quality Control

A brief orientation was given to the data collectors and site supervisors. Moreover, pre-test of the questionnaire was done at first time and necessary adjustments were done based on the feedback. The completeness and consistency was checked at the site by the researcher and supervisors. The missing data, outliers, completeness and consistence were checked before data analysis. This increases the validity of the research.

3.11. Inclusion and Exclusion Criteria

Since the research was focused on the academic DIL for academic performance the study populations were limited only to students and academic staffs. Other university communities were not involved. Because of scare resources and time the researcher.

3.12. Ethical Consideration

Since human subjects were used in both methods of data collection, namely questionnaires and face-to-face interviews, there was the need to consider ethical issues. Respondents were assured of maximum confidentiality possible and the data collected, no names were recorded during the interviewing process and data was accessible only to the researcher. Letters of support was collected from the department of Information Science and was submitted to the responsible bodies at the respective study sites to get permission of data collection. In addition, consent was obtained from the study participants before data collection.

CHAPTER FOUR

4. RESULTS AND DISCUSSIONS

4.1. Results

4.1.1. Response Rate

The total numbers of distributed questionnaires were 371. Only 353 (95.1%) questionnaires were filled and returned. The entire 353 questionnaires were found to be appropriate for the analysis of this particular research study. The questionnaire was made up of both open-ended and close-ended questions. In addition to the questionnaire, face-to-face interviews were also conducted with six respondents three library director and three ICT director.

4.1.2. Socio-Demographics of the Respondents

4.1.2.1. Classification of Respondent's Gender, Category

Table 4.1. Classification of Respondent's Gender and Category of JU, HU and WU Students and Academic Staffs (May, 2014 G.C) N=353

University	Gender			Category			
	Male	Female	Total	Instructor	PG Student	UG Student	Total
Jimma University	114	71	185	35	38	112	185
	61.6%	38.4%	100%	18.9%	20.5%	60.5%	100%
Hawassa University	96	64	160	23	36	102	161
	60.0%	40.0%	100%	14.3%	22.4%	63.4%	100%
Wolkite University	5	2	7	5	0	2	7
	71.4%	28.6%	100%	71.4%	0.0%	28.6%	100%
Total	215	137	352	63	74	216	353
	61.1%	38.9%	100%	17.8%	21.0%	61.2%	100%

According to the result obtained and presented, in Table 4.1 above, 61.1 % (216) of the respondents were males while 38.9% (137) of them were females. Undergraduate students (graduating class) account to 61.2% (216), and 21.0% (74) were postgraduate students and the rest 17.8% (63) of the respondents were instructors. This shows that most of respondents of the were males.

4.1.2.2. Academic Status of the Respondents

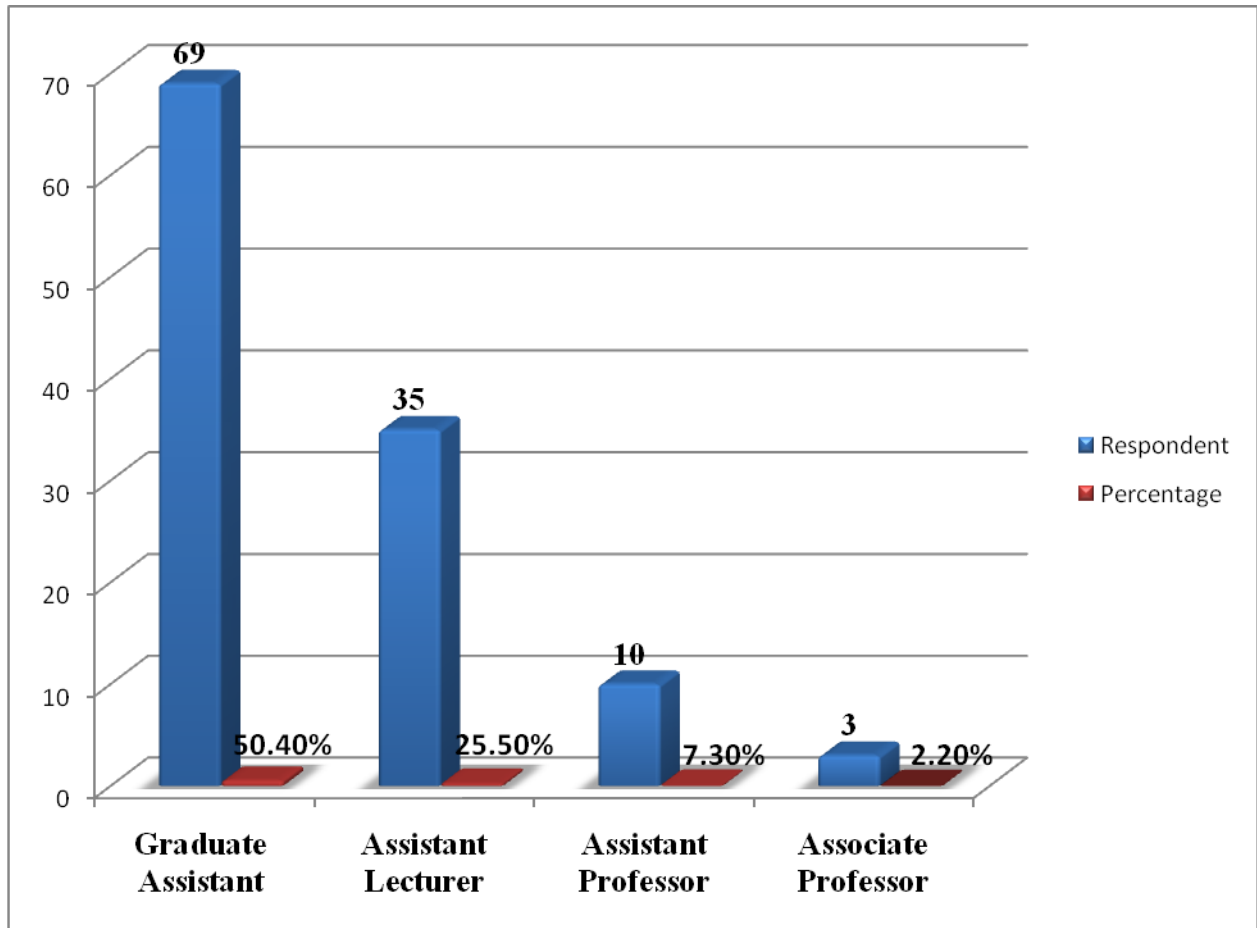


Figure 4.1. Academic Status of JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

The above figure 4.1 indicates that from the academic staff and postgraduate students, majority 50.4% (69) of the respondents were graduate assistants, followed by assistant lecturer 25.5% (35), lecturer 14.6% (20), assistant professor 7.3% (10) and associate professor 2.2% (3). This result shows that the majority of academic staffs and postgraduate student's academic status is graduate assistant.

4.1.3. Quantitative Study Results

4.1.3.1. Availability of Digital Resources

Table 4.2. Availability of Digital and Electronics Resource in JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

Digital/Electronic resources	JU		HU		WU	
	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%
E-journals	108	58.4	128	79.5	0	0.0
E- thesis/dissertation	95	51.4	114	70.8	0	0.0
Mailing lists	120	64.9	68	40.0	2	28.6
News groups	26	14.1	0	0.0	0	0.0
E- archives	82	44.3	0	0.0	0	0.0
E- magazines	65	35.1	0	0.0	0	0.0
E- database	86	46.5	61	37.9	0	0.0
E- books	150	81.1	110	68.3	4	57.1
E-Newspapers	64	34.6	0	0.0	0	0.0
Multimedia	145	78.4	120	74.5	5	71.4
Subject gateways	70	37.9	98	60.1	0	0.0
Online abstracts & indexes	92	49.7	24	14.9	0	0.0

Table 4.2 shows the result on the availability of digital resources in each university is presented in table 4.2. E-journals availability in JU, 58.4% (108) of the respondents said it is available, whereas in HU 79.5% (128) of the respondents said it is available and in WU there is no e-journal at all. As to the E-thesis/dissertation availability in JU 51.4% (95) said it is available and in HU 48.6% (90) said it is available and in WU, E-thesis is completely not available. With respect to mailing lists availability in JU 64.9% (120), in HU 40.0% (68) and in WU 28.6% (2) of the respondents said yes it is available. On one of the very important digital resources, namely for e-database, 46.5% (86), 37.9% (61) of the respondents from JU and HU respectively said it is available and for electronics books 81.1% (150) of the respondents from JU, 68.3% (110) from HU and 57.1% (4) from WU confirmed the existence of e-books. And as to multimedia 78.4% (145), 74.5% (120) and 71.4% (5) of the respondents from JU, HU and WU respectively said it is available. This result indicates that all digital/electronic resources are available only in Jimma University and while some resources are available in Hawassa university, but in Wolkite university only three resources, namely mailing list, e-books and multimedia are available.

4.1.3.2. Use of Digital and Electronics Resources

Table 4.3. Use of Digital and Electronics Resources among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

Uses of digital resources	Never used		Used infrequently		Used regularly	
	F	%	F	%	F	%
Electronic journals	271	76.8	61	17.3	21	5.9
Electronic thesis/dissertation	266	75.4	60	17.1	26	7.4
Mailing lists	223	63.2	110	31.2	20	5.7
News groups	207	58.6	108	30.6	38	10.8
Electronic archives	261	73.9	64	18.1	28	7.9
Electronic magazines	235	66.6	108	30.6	10	2.8
Electronic database	199	56.4	141	39.9	13	3.7
Electronic books	125	35.4	110	31.2	118	33.4
Electronic Newspapers	220	59.3	109	34.8	24	6.0
Multimedia	144	40.8	162	45.9	47	13.3
Subject gateways	181	51.3	140	39.7	32	9.1
Online abstracts & indexes	177	50.1	128	36.3	48	13.6

The result in table 4.3 shows that, only 5.9% (21) of the respondents use e-journals frequently infrequently 17.3% (61), whereas the majority, 78.8% (271) never used it. As to the electronic thesis/dissertation again the majority never use 75.4% (266) it and 17.1% (60) use infrequently and only 7.4% (26) use regularly, and mailing lists is never used by the majority 63.2% (223), which also holds true for news groups electronic archives, electronic magazines, and electronic database as the majority of the respondents never used these resources, electronic database is also never used regularly by 56.4% (199) of the respondents, and infrequently by 39.9% (141) whereby only 5.7% (20) of them used regularly, electronic books are used regularly by good number i.e., 39.9% (141) respondents and by 31.2% (118) respondents infrequently. Moreover, multimedia is used regularly by 40.8% (144) and infrequently by 45.9% (162) of the respondents. Other digital resources are also used regularly only by few respondents, the result shows that majority of the respondents never or infrequently used the available digital resources.

4.1.3.3. Information Source Options

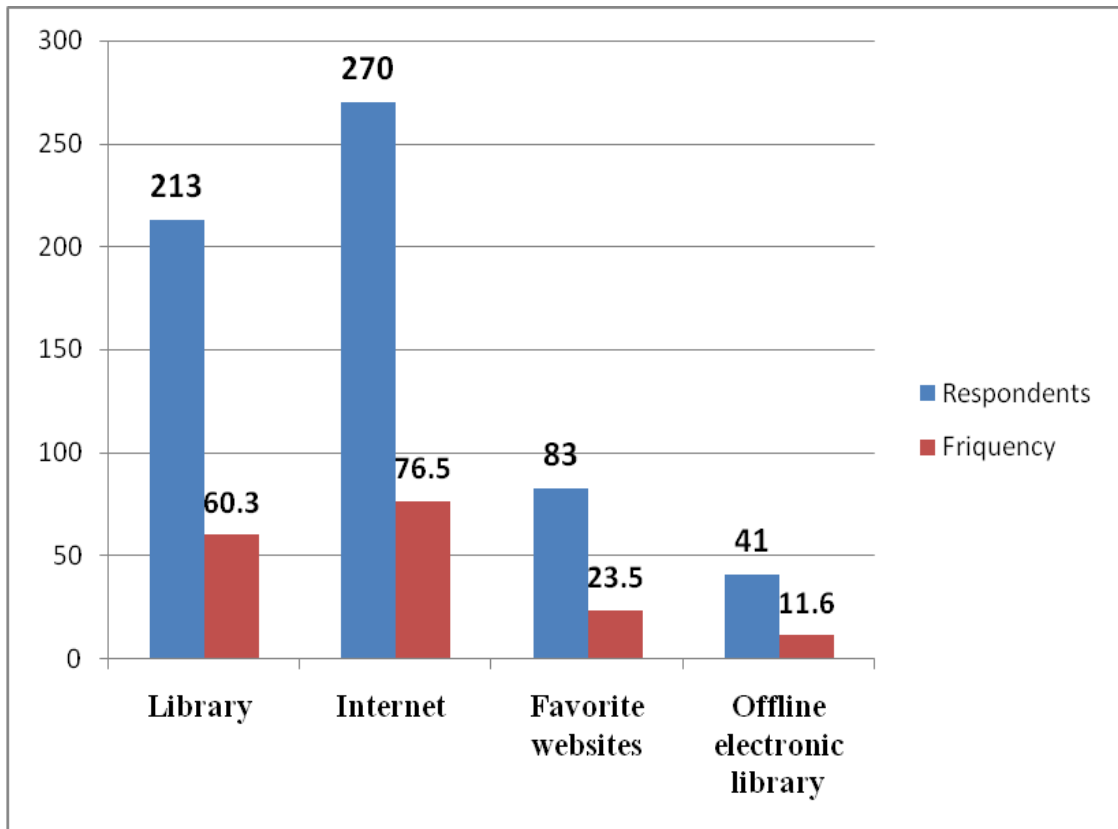


Figure 4.2. Source of Resources among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

The results, as presented in figure 4.2 shows that majority of respondents, 76.5% (270) preferred the Internet as a source of information for their academic work or research followed by library (for books, journals, local library databases etc.) 60.3% (213). They gave varied reasons for their preference of the Internet as a source of information. Some of the reasons they mentioned were: access without any limitation of place and time, accessible and flexible of the content, it makes retrieval faster, the possibility to access a lot of materials within a short period of time.

4.1.3.4. Reasons for Selecting Specific Information Source

Table 4.4. Reasons for Selecting Specific Information Source among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

Select One Source	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	X	SD	DC
To retrieve information faster and at ease	25(7.1%)	28(7.9%)	53(15.0%)	178(50.4%)	69(19.5%)	3.67	1.094	Agree
For accurate and current information	15(4.2%)	19(5.4%)	78(22.1%)	194(55.0%)	47(13.3%)	3.68	.922	Agree
To access a large amount of relevant information	6 (1.7%)	26 (7.4%)	87 (24.6%)	157(44.5%)	77(21.8%)	3.77	.929	Agree
For its affordability	44(12.5%)	122(34.0%)	164(46.5%)	17(4.8%)	6(1.7%)	3.63	.826	Agree
For informativeness	3(0.8%)	14 (4.0%)	104(29.5%)	173(49.0%)	59(16.0%)	3.77	.803	Agree
For different views on the same subject	1(0.3%)	23(6.5%)	80(22.7%)	169(47.9%)	80(22.7%)	3.86	.850	Agree

Range: Mean score of (4.20-5.00) was considered as strongly agree, (3.40-4.20) was taken as agree, the range (2.60-3.40) was considered as neutral, from (1.80-2.60) was taken as disagree and from (1.00-1.80) was as strongly disagree.

Table 4.4 the researcher asked the respondents to rate the questions on the base of the five Likert scale. To analyze the results the researcher considered the percentage corresponding to the mean (X) and the standard deviation (SD) of the scale for analysis respectively. The results confirmed some of the reasons respondents gave for using the Internet most as a source of information.

Accordingly, most respondents would select one source of information over the other for the fact that they got faster and available information 3.67 (1.09), and also for the fact that they got accurate and current information, 3.68 (0.92), another reason is large amount of relevant information, 3.77 (0.93). Respondents also indicated other reasons such as the sources affordability, 3.63 (0.83), informative content, 3.77 (0.8), and also to get different views on the same subject, 3.86 (0.85). From these findings, it can be said that most respondents agree with the above listed reasons, because all the means are between 3.63-3.86.

4.1.3.5. Institution's Digital Information Resource Use of Instruction/Training

Table 4.5. Institution's Digital Information Resource Use of Instruction/Training among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

Increase academic competency	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	X	SD	DC
Established online orientation	70(19.8%)	195(55.2%)	22(6.2%)	48(13.6%)	18(5.1%)	2.29	1.088	Disagree
One-to-one instruction with users	82(23.2%)	204(57.8%)	27(7.6%)	32(9.1%)	8(2.3%)	2.09	.932	Disagree
DILS instruction course integrated in the curriculum	62(17.6%)	182(51.6%)	38(10.8%)	59(16.7%)	12(3.4%)	2.37	1.061	Disagree
Self-guided orientation	36(10.2%)	162(45.9%)	61(17.3%)	79(22.4%)	15(4.2%)	2.65	1.067	Neutral
Short term training	41(11.6%)	135(38.2%)	58(16.4%)	83(23.5%)	36(10.2%)	2.82	1.210	Neutral
Training on workshops	23(6.5%)	165(46.7%)	25(7.1%)	89(25.2%)	51(14.4%)	2.94	1.249	Neutral
Continuous DILS delivery system available through library	21(5.9%)	134(38.0%)	57(16.1%)	90(25.5%)	51(14.4%)	3.05	1.205	Neutral

Table 4.5 Shows the descriptive statistics on how the respondents rate their institution's digital information resource use of instruction/training to increase your academic competency. To analyze the results the researcher considered the percentage corresponding to the mean and the standard deviation of the scale for analysis respectively. Based on this, the majority of staff disagree and were neutral (13.6% (48), 5.1% (18)), (9.1% (32), 2.3% (8)) and (16.7% (59), 3.4% (12)) respectively for the factors; established online orientation, one-to-one instruction with users and DILS instruction course integrated in the curriculum. On the other hand respondents agree for the variables: Self-guided orientation, short term training, training on workshops and continuous DILS delivery system available through library increasing academic competency, because the mean and standard deviation was respectively, 2.65 (1.06), 2.82 (1.2), 2.94 (1.25) and 3.05 (1.2).

4.1.3.6. Digital Information Literacy Skill Delivery Approaches

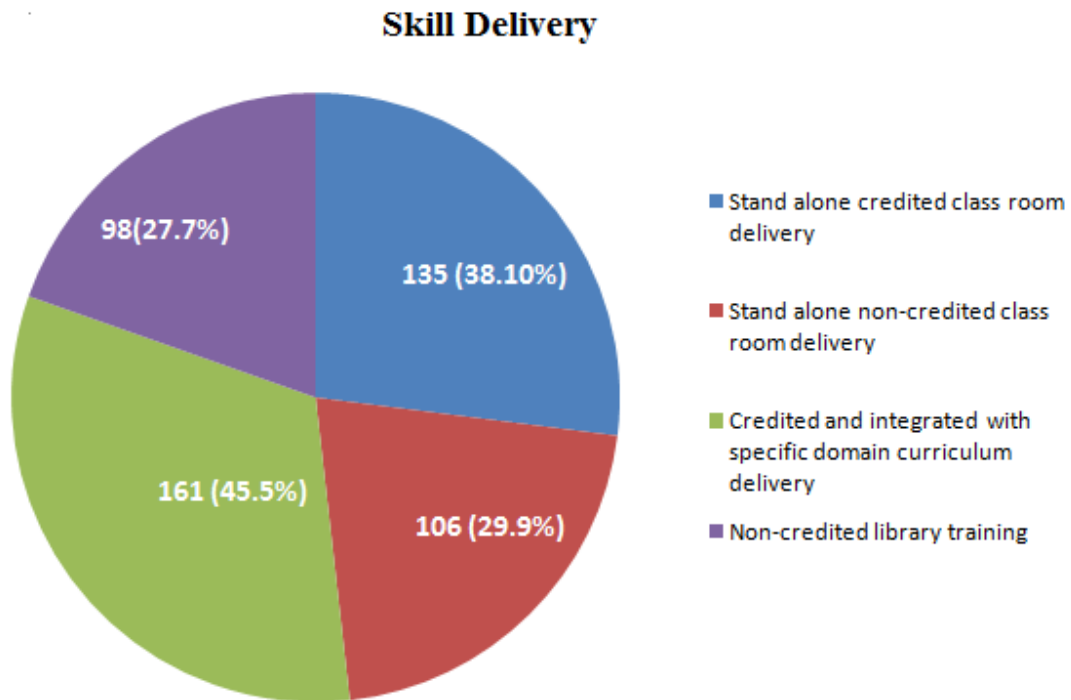


Figure 4.3. Pie Chart Depicting Digital Information Literacy Skill Delivery Approaches among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

Figure 4.3 indicate that as depicting digital information literacy skill delivery approaches and the various digital information literacy skill delivery options and the corresponding response rate in percentages on the figure, 45.5% (161) of the respondents said that digital information literacy skill delivery recommended, credited and integrated with specific domain curriculum delivery, whereas 38.1% (135) said that digital information literacy skill delivery recommended stand alone credited class room delivery and 29.9%(106) said that the digital information literacy skill delivery recommended stand alone non-credited class room delivery and 27.7% (98) and 14% (12) said that the digital information literacy skill delivery recommended non-credited library training.

4.1.3.7. Level of DII versus use of Resources and Academic Competency

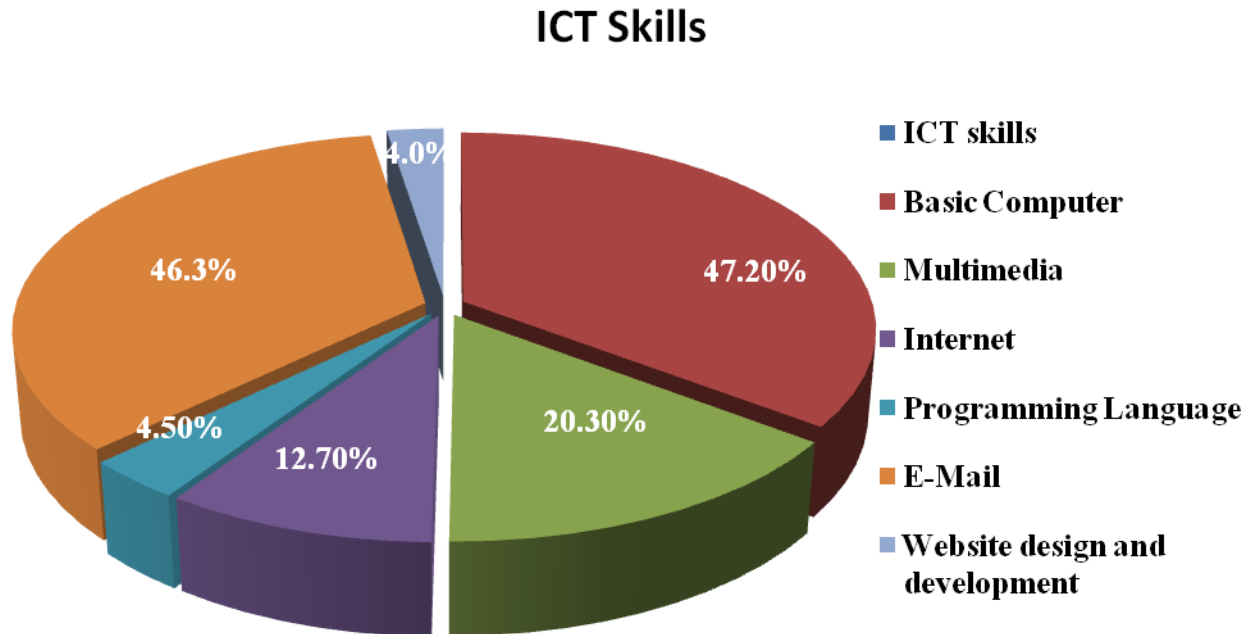


Figure 4.4. ICT Skill of the Academic Staffs and Students among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

The above figure 4.4 on ICT skill indicate that most respondents 47.2% (167) have ability of basic computer skills (MS Word, Excel, Power point, etc), A significant number 20.30%(71) however have multimedia skill, 12.7% (44) of respondents have the skill of using Internet, 46.3%(164) the respondents have skill of using e-mail and only 4.0% (12) of respondents have the skill of website design and development. A majority of the faculty who responded has acquired knowledge of basic computer skills, but knowledge in other areas is less widespread. In general the result shows that majority of the respondents have low ICT skills.

4.1.3.8. Digital Information Literacy Skill against the Factors

Table 4.6. Digital Information Literacy Skill against the Factors among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

Level of skills	Very Poor	Poor	Good	Very good	Excell.	X	SD	DC
I can recognize when there is a need for information	67(19.0%)	136(38.5%)	96(27.2%)	39(11.0%)	15(4.2%)	2.43	1.051	Poor
I can access sources of information and obtaining the relevant information	76(20.1%)	161(45.6%)	76(21.5%)	25(7.1%)	20(5.7%)	2.33	1.052	Poor
I can evaluate the reliability of the information and the effectiveness of the tools and strategies	14(4.0%)	89(25.2%)	106(30.0%)	85(21.1%)	59(16.7%)	2.34	.912	Poor
I can manage the information I accessed	47(13.3%)	187(53.0%)	85(24.1%)	21(5.9%)	13(3.7%)	2.29	.855	Poor
I can create new understandings and organizing information for practical application	57(16.1%)	177(50.1%)	85(24.1%)	28(7.9%)	6(1.7%)	2.29	.890	Poor
I can understand the economic, legal and social issues surrounding the use of information and access and use information ethically and legally	29 (8.2%)	187(53.0%)	90(25.5%)	41(11.6%)	6(1.7%)	2.46	.865	Poor
I can identify potential sources of information	30(8.5%)	173(49.0%)	110(31.2%)	31(8.8%)	9(2.5%)	2.48	.866	Poor
I can develop successful search strategies	53(15.0%)	125(35.4%)	117(33.1%)	53(15.0%)	5(1.4%)	2.52	.968	Poor
I can integrate new information into an existing body of knowledge	46(13.0%)	185(52.4%)	93(26.3%)	26(7.4%)	3(0.8%)	2.31	.820	Poor
I can use information in critical thinking and problem solving	46(13.0%)	165(46.7%)	124(35.1%)	10(2.8%)	8(2.3%)	2.35	.825	Poor

The above table 4.6 Respondents were given some options on factors against digital information literacy skill which were considered, and out of that the following were indicated to analyze the results the researcher considered the percentage corresponding to the mean and the standard deviation of the scale for analysis respectively. 43.5% (154) of respondents can recognition when there is a need for information, 43.8% (155) can access sources of information and obtaining the relevant information, 42.9% (152) can evaluate the reliability of the information and the effectiveness of the tools and strategies, 35.3% (125) can manage the information they accessed, 34.7% (123) can create new understandings and organizing information for practical application, 35.9% (127) can understand the economic, legal and social issues surrounding the use of information and access and use information ethically and legally, 28.2% (100) can identify potential sources of information , 37.0% (131) can develop successful search strategies, 37.9% (134) can integrate new information into an existing body of knowledge and finally 32.2% (114) can use information in critical thinking and problem solving. Based on this, the majority of respondent's has poor digital information literacy skills.

4.1.3.9. Digital Information Literacy Personal Skills

Table 4.7. Digital Information Literacy Personal Skills among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

Digital Information Literacy Skills	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	X	SD	DC
Be able to recognize, articulate, and characterize what is needed to know as one approach a problem, project, writing assignment or other research task	27(7.6%)	28(7.9%)	102(28.8%)	154(43.5%)	42(11.9%)	3.44	1.051	Agree
Be able to access needed information effectively and efficiently independent of form or format	12(3.4%)	32(9.0%)	111(31.4%)	155(43.8%)	43(12.1%)	3.55	1.358	Agree
Be able to evaluate information and information sources critically	0(0.0%)	52(14.7%)	152(42.9%)	116(32.8%)	33(9.3%)	3.37	.846	Neu.
Be able to use information effectively to accomplish a specific purpose as well as to retain selected information as part of accumulated knowledge	2(0.6%)	30(8.5%)	129(36.4%)	125(35.3%)	67(18.9%)	3.64	.904	Agree
Be able to manage and organize information effectively and efficiently using information technologies	8(2.3%)	49(13.9%)	128(36.3%)	123(34.7%)	45(12.7%)	3.42	.956	Agree
Be able to produce and create structured electronic documents that successfully express their ideas for a	6(1.7%)	56(15.9%)	112(31.6%)	127(35.9%)	52(14.7%)	3.46	.982	Agree

specific audience and situation								
Be able to manipulate and use information in the format of audio visual using information technologies	7(2.0%)	27(7.6%)	155(43.8%)	100(28.2%)	64(18.1%)	3.53	.941	Agree
Be able to collaborate appropriately and effectively using information technologies	4(1.1%)	36(10.2%)	135(38.1%)	131(37.0%)	47(13.3%)	3.51	.889	Agree
Be able to successfully communicate produced content using information technologies	3(0.8%)	22(6.2%)	139(39.3%)	134(37.9%)	55(15.5%)	3.61	.853	Agree
Be able to participate as informed members of the academy who understand major legal, economic, social, ethical, privacy, and security issues related to information technologies	3(0.8%)	21(5.9%)	143(40.4%)	114(32.2%)	72(20.3%)	3.65	.898	Agree
Recognizes that accurate and complete information is the basis for intelligent decision making	2(0.6%)	67(18.9%)	129(36.4%)	125(35.3%)	30(8.5%)	3.64	.904	Agree
Knows how to locate needed digital information	27(7.6%)	28(7.9%)	102(28.8%)	154(43.5%)	42(11.9%)	3.44	1.051	Agree
Formulates questions based on information needs	12(3.4%)	32(9.0%)	111(31.4%)	155(43.8%)	43(12.1%)	3.55	1.358	Agree
Accesses sources of information including computer based and other technologies	7(2.0%)	27(7.6%)	155(43.8%)	64(18.1%)	100(28.2%)	3.53	.941	Agree
Organizes information for practical application	7(2.0%)	27(7.6%)	155(43.8%)	100(28.2%)	64(18.1%)	3.53	.941	Agree

Table 4.7 shows their digital information literacy personal skills, to analyze the results the researcher considered the percentage corresponding to the mean and the standard deviation of the scale for analysis respectively. Respondents rated their information literacy skills based on the above describe skill and the majority of respondents said they have average skills and all respondents almost agree the above skills. The range of the mean between the skills were (3.64(0.904)-3.42 (.956)). Digital information literate persons were considered by the respondents as someone doing any academic activity which involves search and use of information, and also know what type of information technologies exist and what they are useful for.

4.1.3.10. Descriptions of an Information Literate Person

Table 4.8. Descriptions of an Information Literate Person among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

Personal Competency	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	X	SD	DC
Finds information to form a personal standpoint	67(19.0%)	53(15.0%)	75(21.2%)	81(22.9%)	77(21.8%)	3.14	1.414	Neutral
Critically analyses information trying to reveal values	22(6.2%)	65(18.4%)	85(24.1%)	100(28.3%)	81(22.9%)	3.43	1.204	Agree
Has acquired mental models of information systems	15(4.2%)	52(14.7%)	106(30.0%)	109(30.9%)	71(20.1%)	3.48	1.098	Agree
Initiates a process	2(0.6%)	25(7.1%)	115(32.6%)	138(39.1%)	73(20.7%)	3.72	.890	Agree
Works towards going new insights	3(0.8%)	11(3.1%)	117(33.1%)	121(34.3%)	10(28.6%)	3.87	.896	Agree

The above table 4.8 Identifying how best to describe an information literate person, the options were selected among various attributes found in information literacy. Most of the respondents described an information literate person as someone who finds information to form a personal standpoint whereby 21.2% (75) neutral, critically analyses information trying to reveal values 28.3% (100) agreed, acquired mental models of information systems 30.9% (109) agreed, initiates a process 39.1% (138) agreed and lastly works towards going new insights 34.3%

(121) agreed. Therefore, it is possible to say that an information literate person has all qualities that are listed and can do any activity which involves search and use of information, and also know what information technologies exist and what they are useful for.

4.1.3.11. Deficiency in Digital Information Literacy Skills on Academic Activity

Table 4.9. Deficiency in Digital Information Literacy Skills on Academic Activity among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

University	Deficiency In Digital Information Literacy Skills		Total	Chi-square(p-value)
	Yes	No		
Jimma University	141 76.2%	44 23.8%	185 100.0%	0.56(0.76)
Hawassa University	120 74.5%	41 25.5%	161 100.0%	
Wolkite University	6 85.7%	1 14.3%	7 100.0%	
Total	267 75.6%	86 24.4%	353 100.0%	

The above table 4.9 indicate that, at 5% level of significance the chi-square value 0.56 implies there is no association between institution and deficiency DILS present. The deficiency in information literacy skills and its effect on academic work or research revealed that all the respondents that deficiency in digital information literacy skills can affect one’s academic work or research, 76.2% (141) of respondents from JU, 74.5% (120) from HU, and 85.7% (6) from WU responded “Yes”. The result is shown that the majority of respondents they said deficiency of digital information affects their academic activity. At 5% level of significance the chi-square value 0.56 implies there is no association between institution and deficiency digital information skills presentences.

4.1.3.12. Digital Information Literacy Skills Training

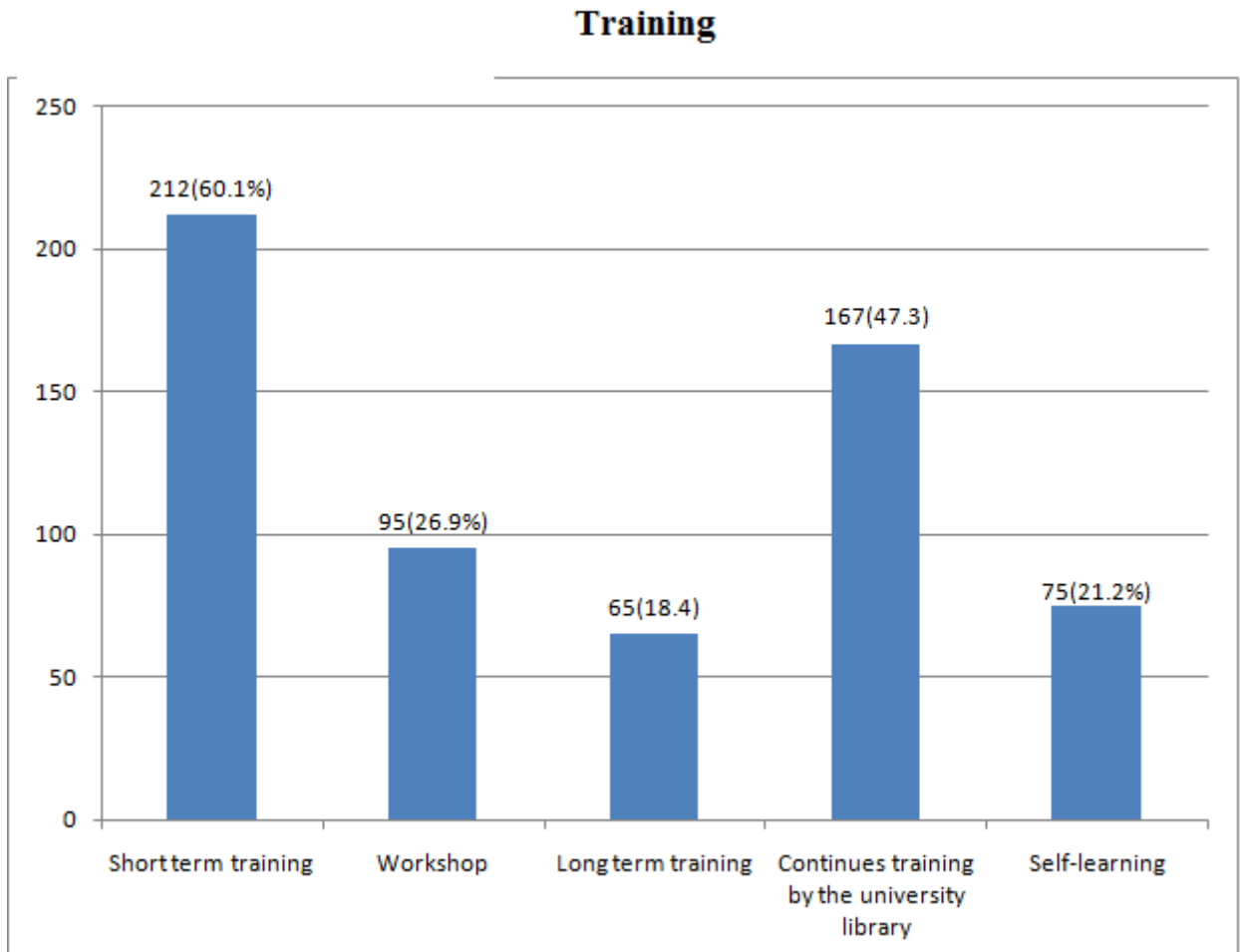


Figure 4.5. Digital Information Literacy Skills Training among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

The above figure 4.5 indicate what should be done to fill the deficiency in digital information literacy skills and all the respondents think that deficiency in information literacy skills need short term training 60.1% (212), workshop 26.9(95), long term training18.4%(65), continues training by the university library 47.3%(167) and self learning 21.2%(75). The result shows that most of the respondents want short term training and continues training by the university library as ways of filling the deficiencies in DILS.

4.1.3.13. Difficulties in Retrieving Relevant Information

Table 4.10. Difficulties in Retrieving Relevant Information among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

Information use Difficulty	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	X	SD	DC
I have difficulty to recognize the information needed	22(6.2%)	30(8.5%)	33(9.3%)	140(39.7%)	128(36.3%)	3.91	1.163	Agree
I have difficulty to access and obtain the information	32(9.1%)	38(10.8%)	48(13.6%)	159(45.0%)	76(21.5%)	3.59	1.198	Agree
I have difficulty to evaluate the reliability of the information and the effectiveness of the tools and strategies	34(9.6%)	17(4.8%)	25(7.1%)	159(45.0%)	118(33.4%)	3.88	1.206	Agree
I have difficulty to manage the information I accessed	23(6.5%)	58(16.4%)	67(19.0%)	118(33.4%)	87(24.6%)	3.53	1.211	Agree
I have difficulty to apply and create new understandings	28(7.9%)	31(8.8%)	34(9.6%)	146(41.4%)	114(32.3%)	3.81	1.206	Agree
I have difficulty to understand the ethical use of information	21(5.9%)	52(14.7%)	70(19.8%)	115(32.6%)	95(26.9%)	3.60	1.198	Agree

The above table 4.10 indicates that the difficulties usually faced in retrieving relevant information for academic activity. To analyze the results the researcher considered the percentage corresponding to the mean and the standard deviation of the scale for analysis respectively. Based on this, the majority of respondents strongly agrees that they have difficulty to recognize the information needed (39.7% (140), 36.3% (128)) of the respondents agreed and strongly agreed, there have difficulty to access and obtain the information (45.0% (159), 21.5% (76)) of the respondents agree and strongly agree, there have difficulty to evaluate the reliability

of the information and the effectiveness of the tools and strategies (45.0% (159), 33.4% (118)) of the respondents agreed and strongly agreed, there have difficulty to manage the information there accessed (33.4% (118), 24.6% (87)) of the respondents agreed and strongly agreed, they have difficulty to apply and create new understandings (41.4% (146), 32.3% (114)) of the respondents agreed and strongly agreed, and they have difficulty to understand the ethical use of information (32.6% (115), 26.9% (95)) of the respondents agreed and strongly agreed.

The above result shows that the deficiencies in digital information literacy skills can create difficulty to recognize, access, and locate information needed. And also it shows deficiency in digital information literacy skills has a negative impact on academic achievements, as well as personal and professional development. All these reasons confirm the fact that digital information literacy is very important.

4.1.3.14. Views on Digital Information Literacy’s Helpfulness

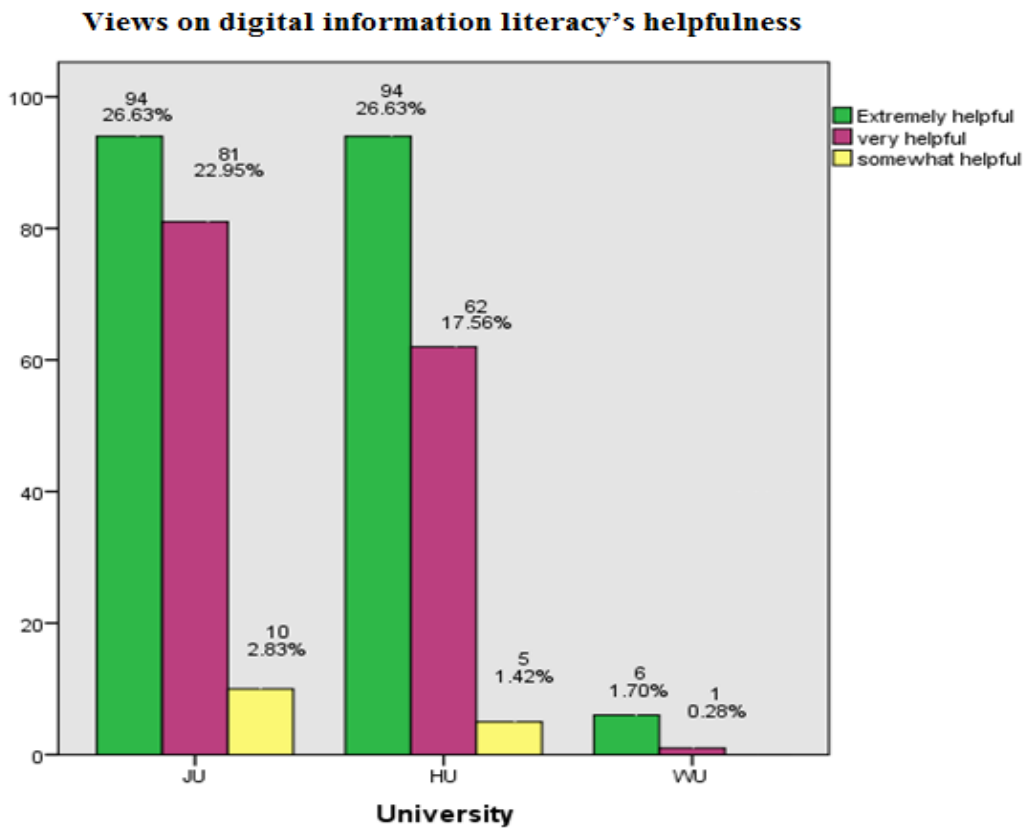


Figure 4.6. Views on Digital Information Literacy’s Helpfulness among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

The above figure 4.6 indicate that, majority of the respondents confirmed that information literacy has been helpful in one way or another in their academic work or research. Those who confirmed that information literacy has been very helpful were 40.8% (144), and extremely helpful 55.0% (194). However, some respondents indicated that information literacy has been somewhat helpful 4.2% (15), in their academic work or research. With the above findings, it can be said that information literacy has been extremely helpful to most of the respondents in their academic work or research.

4.1.3.15. Factors Affecting Skill Development

Table 4.11. Factors Affecting Skill Development among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

Select One Source	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	X	SD	DC
There is university library training program on how to use the digital resources	57(16.1%)	104(29.5%)	95(26.9%)	66(18.7%)	31(8.8%)	2.75	1.191	Neutral
Confidence and belief in own ability (self-efficacy)	37(10.5%)	100(28.3%)	113(32.0%)	92(26.1%)	11(3.1%)	2.83	1.031	Neutral
Personal interest/motivation to collaborate and share	28(7.9%)	42(11.9%)	162(45.9%)	110(31.2%)	11(3.1%)	3.10	.930	Neutral
There is work load/responsibilities/shortage of time	8(2.3%)	60(17.0%)	135(38.2%)	139(39.4%)	11(3.1%)	3.24	.850	Neutral
Technological skills as well as the investigative and critical thinking	17(4.8%)	62(17.6%)	116(32.9%)	119(33.7%)	39(11.0%)	3.29	1.034	Neutral
Educational level	46(13.0%)	56(15.9%)	98(27.8%)	100(28.3%)	53(15.0%)	3.16	1.241	Neutral

Table 4.11 shows, the descriptive statistics on factors affecting digital information literacy skill development in Ethiopian higher institution. To analyze the results the researcher considered the percentage corresponding to the mean and the standard deviation of the scale for analysis respectively. Based on this, the majority of the respondents were neutral or undecided, 26.9%

(95), 32.0% (113), 45.9%(62), 38.2%(135), 32.9% (116) and 27.8% (98) respectively there is university library training program on how to use the library, confidence and belief in own ability (self-efficacy), personal interest/motivation to collaborate, there is work load/responsibilities/ shortage of time, technological skills as well as the investigative and critical thinking and educational level.

4.1.3.16. Factors that Affect Digital Literacy Skills Acquisition

Table 4.12. Factors Affecting Skill Acquisition among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

Factors	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	X	SD	DC
Luck of institutional strategy/policy	34(9.6%)	32(9.15)	28(7.9%)	154(43.6%)	105(29.7%)	3.75	1.244	Agree
Luck of institutional motivation and commitment	19(5.4%)	52(14.7%)	37(10.5%)	130(36.8%)	115(32.6%)	3.76	1.205	Agree
Unavailability of ICT infrastructure	17(4.8%)	31(8.8%)	56(15.9%)	134(43.6%)	105(38.0%)	3.85	1.118	Agree
Shortage of skilled power	11(3.1%)	48(13.6%)	76(21.5%)	136(38.5%)	82(23.2%)	3.65	1.074	Agree
Limited electronics resources usage	16(4.5%)	70(19.8%)	49(13.9%)	120(34.0%)	98(27.8%)	3.61	1.211	Agree
Technical support mechanisms unavailable	22(6.2%)	55(15.6%)	49(13.9%)	118(33.4%)	109(30.9%)	3.67	1.236	Agree

The above table 4.12 shows that, factors affecting digital information literacy skills acquisition: there is lack of institutional strategy/policy (43.6% (154), 29.7% (105)), Lack of institutional motivation and commitment, (36.8%(130), 32.6% (115)) of the respondents agreed and strongly agreed; unavailability of ICT infrastructure (43.6% (134), 38.0% (105)) of the respondents agreed and strongly agreed; shortage of skilled power (38.5% (136), 23.2% (82)) of the respondents agreed and strongly agreed; limited electronics resources usage (34.0% (120), 27.8% (98) of the respondents agreed and strongly agreed and lastly technical support mechanisms unavailable (33.4% (118), 30.9% (109) of the respondents agreed and strongly agreed. These were lack of awareness of the concept, importance and necessity of digital information literacy in today's life and world, lack of organizational support, methodology of delivery, technological barriers, and lack of institutional policy.

4.1.3.17. The relationship between DIL versus Academic Competency

Table 4.13. Digital Information Literacy versus Academic Competency among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

4.13.1. Descriptive

Competency

University	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
JU	185	2.3354	.31332	.02304	2.2899	2.3808	1.95	3.71
HU	161	2.2955	.29113	.02294	2.2502	2.3408	1.86	3.38
WU	7	2.0677	.09516	.03597	1.9797	2.1557	1.95	2.14
Total	353	2.3119	.30264	.01611	2.2802	2.3436	1.86	3.71

4.13.2. Summary of ANOVA (F) measure value for Digital Information Literacy versus Academic Competency

Competency

Groups	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.563	2	.282	3.110	.046
Within Groups	31.678	350	.091		
Total	32.241	352			

4.13.3. Dependent variables multiple comparisons

University	University	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
JU	HU	.03992	.03243	.219	-.0239	.1037
	WU	.29526*	.11585	.011	.0674	.5231
HU	JU	-.03992	.03243	.219	-.1037	.0239
	WU	.25534*	.11616	.029	.0269	.4838
WU	JU	-.29526*	.11585	.011	-.5231	-.0674
	HU	-.25534*	.11616	.029	-.4838	-.0269

* The mean difference is significant at the 0.05 level.

Table 4.13 shows that the mean difference is significant at the 0.05 level relationship between the digital information literacy skills and the academic competency within the university there is a significant difference. Therefore there is significant difference in relationship between the digital information literacy skills for academic competencies within university.

4.1.3.18. The relationship between DIL versus Academic Competency

Table 4.14. Level of Digital Information Literacy Skill among JU, HU and WU Students and Academic Staffs, (May, 2014 G.C) N=353

Items	Very low	Low	Average	High	Very high	X	SD	DC
Move into situations which require me to apply more sophisticated information-gathering skills	10(2.8%)	9(2.5%)	72(20.4)	154(43.6%)	108(30.6%)	3.97	.932	High
There is increasing demand of skill development as the invention of new technologies is ever increasing for academic purposes	7(2.0%)	13(3.7%)	64(18.1%)	162(45.9%)	107(30.3%)	3.99	.901	High
Need to develop DILS in relation to the location, retrieval, analysis and application of information	3(0.8%)	9(2.5%)	43(12.2%)	57(16.1%)	241(68.3%)	4.47	.923	Very High
Increase confidence in using digital/computer technologies to prepare to create digital information	20(5.7%)	19(5.4%)	70(19.8%)	180(51.0%)	64(18.1%)	3.71	1.010	High

The above Table 4.14 shows that, the level of the respondents' skill to which they rate it based on the statements presented. Accordingly for the statement: move into situations which require applying more sophisticated information gathering skills the rate is high (43.6% (154); there is increasing demand for skill development as the creation of new technologies is ever increasing for academic purposes is high 45.9% (162); the need to develop digital information skills in relation to the location, retrieval, analysis and application of information result is very high 68.3% (241) and increase confidence in using digital/computer technologies to prepare to create digital information with slightly different percent result is 180(51.0%). From this result the researcher concludes that the attitude of digital skills development on information literacy of the respondents is high and very high.

4.1.4. Qualitative Results

Based on the purposive sampling methods; ICT and library heads interviewed for this research. Accordingly, six of them were available and interviewed and the finding summarized and presented below:

4.1.4.1. Analysis of Interviews

In order to get the views, understanding of digital information literacy they gave somewhat similar responses for their understanding of the concept. Some of them understood digital information literacy as the competency or the ability to access, evaluate, and use information effectively and efficiently to construct knowledge, but this should be preceded by the realization of an information need. Others understood digital information literacy in the context of learning and therefore saw information literacy as acquiring the ability how to learn, in other words it is how to seek for information to accomplish a given task. Other views linked information literacy to lifelong learning, as one interviewee mentioned “digital information literacy is a lifetime process of being able to identify your information need and the ability to identify and organize the source of information in satisfying that need”.

On the approach to Digital Information Literacy in Academic competency, interviewees were asked their opinion on the best approach institutions should adopt in teaching digital information literacy and at which level of education and they thought it was very convenient to introduce digital information literacy education. Accordingly, all the interviewees suggested that digital information literacy should be embedded into the curriculum with collaboration between librarians and faculty to make it very effective, and students should be examined as well. In effect, one interviewee mentioned that “digital information literacy should be collaboratively taught by both faculty and librarians as an integrated course in the curriculum and all subjects must impart it”. Similarly another interviewee said “digital information literacy (DIL) should be part of the curriculum, implying collaboration between librarians and faculty”.

On the challenges to digital information literacy education, the interviewees answered positively and they listed the following as challenges to digital information literacy education: lack of awareness, not recognizing the importance of the concept, at times lack of interest by both

faculty and students, lack of funds to implement and support information literacy programmes. They also mentioned the fact that sometimes students are not taught the right content in digital information literacy programmes and also the fact that information literacy teachers lack the required skills themselves to teach information literacy and teach it well.

They further mentioned lack of collaboration between faculty and librarians and the fact that usually the digital information literacy courses are not academically examined as challenges affecting information literacy education. Again, one interviewee raised policy issues and congested curriculum, he mentioned that absence of implementation strategies, absence of policy makers and enforcers trained in the field of information studies, congested curriculum and ICT infrastructure can be challenges to digital information literacy education. There is also, lack of digital information literacy skills and at times lacking of search strategies, that is using the right keywords and search terms as some of the difficulties they faced in retrieving digital information. One interviewee stated thus “sometimes I find difficulties formulating the right keywords and search terms to retrieve relevant information”. They suggested therefore that open access should be encouraged so that information could be accessed without so much restrictions, and students should develop more interest in information literacy education.

When posed with a question about the significance of digital information literacy, all the interviewees agreed that information literacy is very important in education and they also mentioned that being digital information literate has a lot of benefits for the person, particularly, as a graduate student, one needs to be information literate in order to be equipped with some competencies to excel in academic work and also to be able to adapt to the ever changing world of information. One interviewee summarized it by saying the application of information literacy in education is very important since it gives one the competence of excelling in his or academic courses. It further provides a lifetime ability to be able to adapt to this ever changing world. Interviewees also mentioned that information literacy is very important in education and we cannot do without it because digital information literacy is learning how to learn and moreover education is about learning, so information literacy is the key to a successful learning. This fact was also expressed by one interviewee that education is all about being informed or enlightened through the right information, as such information literacy is an opportunities to education.

On the issue to do with preference of the sources of digital information, mostly interviewees stated that they got most of their information online (from Internet) and from academic databases because it is easy to access relevant materials and it is very convenient as well. They also mentioned that they consulted library databases, and materials available in the library such as research papers and textbooks.

Additionally, they relied on experts for authoritative views, and also on their colleagues for information. However, they cited issues like restrictions on access to some online databases.

The interviewees were also asked to give any comments or suggestions about digital information literacy skills. They gave various comments and suggestions which in their opinion could help improve digital information literacy skill. In the first place, some interviewees mentioned that digital information literacy is a catalyst for learning and as such educational institutions should be encouraged and given the needed support in terms of funding and other resources to enable them to take digital information literacy seriously and also empower students. Others also mentioned that digital information literacy should be recognized as a very important concept by all staffs and students therefore it should be given the needed attention in every discipline of life. Since the technology paradigm has made the library to shift from being the “gatekeeper” to being the “gateway” to information, DIL has gained ascendancy and indispensability. However, the main challenges to the staffs and students in this regard, would then be to possess the requisite skills and knowing the best method of teaching DIL for result.

Finally, their views on digital information literacy, and some of them mentioned that information literacy is very relevant and also very important for everyone considering the amount of information one has to deal with daily in school, at the workplace and for other purposes as well. One interviewees said “digital information literacy is very relevant today, with the huge amount of sources of digital information I encounter every day, everyone should know how to deal with them, and I think information literacy can help us with that”.

Another interviewees agreed by stating that “digital information literacy should be encouraged in every discipline, not only in academic, but also in workplaces as well and in all aspects of life since we live in a knowledge economy era where information is a very important resource for

development and achievement of goals”. Two other interviewees expressed their view by saying “digital information literacy is a basic issue that needs attention since we are living in the digital age”, “digital information literacy cuts across every discipline, and as such it should be given maximum attention at all levels of education to meet the goals of a lifelong learning and information society”.

4.1.4.2. Analysis of Observation

The observation on the availability of resources was made in three higher institutions and discussed with different responsible body. Accordingly, Availability of ICT tools and enough infrastructure, internet connection, wireless connection, different e-resources, resource discovery tools such as search engine, online research gateway and web OPACs, using online tools and websites to find, share and record information online, web 2.0 tools such as multimedia, blog/wiki and social media, of digital library system, accessibility of institutional repository, desktop computer and internet connectivity for students in the library for staff in the office, and every staffs have their own laptop and digital information literacy skill training mechanism. All the above mentioned digital resources were available in Jimma University but some of the resources were not sufficient.

In Hawassa University some of resources available were: ICT tools and enough infrastructure, internet connection, wireless connection, different e-resources, resource discovery tools such as search engine, online research gateway and web OPACs, using online tools and websites to find, share and record information online, web 2.0 tools such as multimedia, blog/wiki and social media, of digital library system, and digital information literacy skill training mechanism.

Wolkite University almost all digital and electronics resources unavailable, but only there are wireless connection, limited ICT infrastructure, and digital information literacy skill training mechanism, but wireless internet connection is available a limited area and only a department head and a top level management has their own laptop and desktop the rest of the resources.

4.2. Discussion

Participants in the study were drawn from students, and academic at each of the three participating institutions. While the participants in the study span the range of representation the researchers were seeking. Interestingly the researchers in the study also tended to fall within the most represented group that is 61.1%. It is possible that the need for fostering digital information literacy is seen as particularly relevant by this group.

Regarding availability of digital and electronic service, the respondents from Hawassa university indicated that highly available e-journals, e-thesis and dissertation, and subject gateways while in Jimma university mailing list, e-archives, e-magazines, e-databases, e-books, e-news paper, multimedia resources were highly available but in case of Wolkite university except mailing lists, e-books and multimedia resources there are no services. However the extent of using services among users was indicated neutral it seems normal. The main medium to use services for both categories of respondents is library (for books, journals, local library databases etc.) next to internet (for search engines, online databases etc.). The possible explanation for the use of electronic journals, e-thesis and dissertation to be highly valuable for the study participants, which is obvious, is to refer such resource during their research work and thesis write up. Due to ease of access of such resource as they are available in soft copy anytime and anywhere, those resources are preferred by both students and faculty in higher education institutions.

The finding of the research indicated that institution's digital information resource use of instruction/training for established online orientation, one-to-one instruction with users and DILS instruction course integrated in the curriculum were low and it is indicated that very good for self-guided orientation, short term training, training on workshops and continuous DILS delivery system available through library. From modes of digital information literacy skill delivery respondents indicated credited and integrated with specific domain curriculum delivery and digital information literacy skill delivery recommended stand alone credited class room delivery was given high values.

The research finding shows that most of the study participants were less experience in using computers and most individuals were not familiar or confident with tools other than the most common ones people tended to use for their work or study, such as word processing,

spreadsheets, search engines, library databases, presentation software etc.. In several instances, participants who had previously believed they are computer literate, when exposed to new digital tools and approaches, discovered that they had a lot more to learn. This study is in agreement with Phelps, (2002) who stated that the expectation of a finite computer literacy, and the idea of working towards an endpoint when learning about information communication technologies for accessing and handling digital information is unrealistic and impossible, as the environment is in a constant state of change. It can be argued that it is the strategies for learning and handling change in technological environments, rather than a standardized literacy which are the key to success and the ongoing development of digital information literacy. Therefore, even if a standardized test for digital information literacy could be checked off, the minute a new software or technology appears on the horizon a person previously regarded as literate can easily become in dilemma about his/her skill.

In general the majority of study participants were university level educated qualification in diverse disciplines. This tends to support the idea that the factors influencing participation in the study have more to do with personal relevance and context than any specific gaps in education.

Participants' perceptions of their digital information skills were explored further with respect to weight of the notion of personal relevance, especially in relation to the increasing use and sophistication of ICT in the university. Across the three institutions the vast majority of respondent's skill was very poor in order to access the resources. While 47.2% of those surveyed rated themselves as having a basic computer skill, close to 20% of participants identified multimedia literacy skill and 7% of the respondents indicated they have Internet skill. Thus indicated digital and information literacy skill among respondents were very poor.

Based on the DIL, table 4.7, respondents indicated positive response on digital information literacy skill against factors affecting access to information sources in their university. Perhaps respondents indicated that information literacy has been helpful to them in all the ways mentioned and they indicated that digital information literacy was helpful in managing the information they collected for academic or research purposes.

Regarding on the relationship between digital information literacy skill and academic competency were presented in table 4.15. From the finding, it is revealed that there is no a significance relationship between the skill of digital information literacy and academic competency. This purely indicated that the relationship is positive and fairly strong. This means in effect that the more digital information literacy possessed by the academic staff and students the high academic competency is likely to be. This finding is relevant here because according to Omolewa (2008) to be acknowledged as an international scholar, an academic must have access to wide range of digital information resource, must be current and know what is going on in his field. According to him, only an academic who is information literate can do this.

Further additional support for this finding is drawn from the work of Founad (2000). Writing on the relationship between information literacy competencies and academic productivity, Founad (2000) asserted that access to sophisticate information tools without a conceptual base for use will result in the diffusion of meaningless research efforts. According to him, critical inaccessibility on the other hand deals with the users' inability to analyse and evaluate the content of the material in term of its currency. The implication of Founad's assertion is that access to information depends on the knowledge of where to locate information the ability to evaluate and analyse information for use.

Generally the research finding indicated that the digital literacy skill of users among all universes was poor.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

This study was undertaken to find out the extent of digital information literacy skill correlates with academic productivity among the academic staff and students in Ethiopian Higher Institutions.

The overarching message from this research is that capability, rather than a standardized literacy, is key to success in dynamic technological environments. This capability integrates strategies for learning, and takes into account particular dispositions for handling digital information and change in digital environments.

The data gathered from staff and students in three different universities, using a mixed methods approach, provided a broad and diverse body of evidence for the use of flexible and individualized methods to support the development of digital information literacy in the universities.

As to the use of digital information resources, such as e-journals, e-thesis and dissertation were found to be highly valuable for the study participants. Thus, it can be concluded that this is due to ease of access of such resources, any time anywhere, using the technologies we have at present, like accessing using mobile phones and reading from the screen of phones or e-book readers and indeed future hi-tech applications to come. Hence, the increase in the trend of preference for digital information literacy is highly probable.

This study was undertaken to find out the extent to which digital information literacy relationships with academic competency among the academic staff and students. The result shows that the mean difference is significant at the 0.05 level relationship between the digital information literacy skills and the academic competency within the university there is a significant difference. Therefore there is no significant relationship between the digital information literacy skills for academic competencies within university.

5.2. Recommendations

Based on the findings, the researcher strongly recommends the following measures to be taken in the first place. It is important to mention that digital information literacy is a catalyst for learning and as such higher educational institutions should be encouraged and given the needed support in terms of funding and other resources to enable them to take digital information literacy seriously and also empower students and staffs. An important task for librarians, faculty and other educators would be to help students and staffs to improve their ability to seek and use digital information by developing appropriate methods for teaching digital information literacy delivery.

- Library and information communication technology departments should introduce different types of training programs for unskilled professionals.
- The universities should cooperate with each other for the development of digital information literacy competences of the users.
- Educators and information services personnel should continue to engage in discussion and debate with the intention of reviewing and redeveloping a definition of digital information literacy to strengthen future programmes for developing and maintaining the digital information skills and capability of academic staff and students.
- The study recommends that the academic staff and should take advantage of the enabling environment to enhance their level of digital information literacy which will have positive effect on their academic work and research output.
- In the efforts to achieve a high quality of academic achievements among students and academic staffs through incorporating digital information literacy included these skills have to be integrated into the university curriculum and taught in every program.
- They also have to allocate one session during the classroom lectures to teach and communicate the concepts of digital information literacy. Besides that, online tutorials of digital information literacy can be conducted with the usage of learning management system instead of face-to-face workshops.
- Librarians must be able to coordinate the selection and evaluation of the best information sources for the university programs with the assistance of students and academic staffs.

Further areas of Research Recommended

- Use the findings from this study as a baseline for developing measures of DIL in future research.
- Investigate the most appropriate model of professional development for DIL development (fully online, face to face or blended) and the importance of time allocation for play in digital information environments.

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Appendix I

Questionnaire for Academic Staffs, Postgraduate Students and Undergraduate Graduate Class

Introduction

Digital Information Literacy (DIL) is the ability to recognize the need for, to access, and to evaluate electronic information. The digitally literate can confidently use, manage, create, quote and share sources of digital information in an effective way. The way in which information is used, created and distributed demonstrates an understanding and acknowledgement of the cultural, ethical, economic, legal and social aspects of information.

Dear respondents, the goal of the research is to investigate digital information literacy skills perspective on academic competencies in Ethiopian higher institutions. So, to achieve the goal of the research you are kindly requested to give real answer for the questions presented below. The information gathered will be used only for the research purpose. No part of the information will be given for third party or will be used for other purposes. For any concern or question please contact me at the following address:

Hiwot Aydefefer (MSc Student),

Cell Phone 0917806805

e-mail hiwotay@yahoo.com.

Part I. General information

Instruction: Please answer the following questions. Please put (✓) in the appropriate box so we can deal with your response properly.

1.1. From which university you are?

- Jimma University Hawassa University Wolkite University

1.2. Which Category do you belong?

- Instructor Postgraduate student undergraduate graduating class

1.3. If you are instructor, what is your academic status?

- Graduate Assistant Assistant Lecturer Lecturer
 Assistant professor Associate Professor Professor

1.4. Sex:

- Female Male

2. Digital resources availability and type of digital resources

2.1. What type of digital resource available in your institution and to what extent do you use them?

1= Never Use

2= Use Infrequently

3= Use Regularly

* If you say available rate your use of the resources, but if you say not available skip to rate

Resources and Type	Available	Not available	1	2	3
Electronic journals					
Electronic thesis/dissertation					
Mailing lists					
News groups					
Electronic archives					
Electronic magazines					
Electronic database					
Electronic book					
Electronic Newspapers					
Multimedia					
Subject gateways					
Online abstracts & indexes					

2.2. Which source of information do you prefer the most for your academic work or research?

Library (for books, journals, local library databases etc.)

Internet (for search engines, online databases etc.)

Favorite websites

Offline electronic library

Other, please specify _____

2.3. Why would you select one source over the other?

1= Strongly disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly agree

Information Sources	1	2	3	4	5
To retrieve information faster and at ease					
For accurate and current information					
To access a large amount of relevant information					
For its affordability					
For its informativeness					
For different views on the same subject					

Other, please specify _____

3. Instructional initiative vs digital information competency

3.1. How do you rate your institution's digital information resource use of instruction/training to increase your academic competency?

1= Strongly disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly agree

Instructional Communication	1	2	3	4	5
Established online orientation					
One-to-one instruction with users					
Digital information literacy skill instruction course integrated in the curriculum					
Self-guided orientation					
Short term training					
Training on workshops					
Continuous digital information literacy skill delivery system available through library					

3.2. What mode of digital information literacy skill delivery do you recommend?

- Stand alone credited class room delivery
- Stand alone non-credited class room delivery
- Credited and integrated with specific domain curriculum delivery
- Non-credited library training

4. Level of digital information literacy vs use of resources and Academic competency

4.1. Which ICT skills do you possess? Select all that apply

- Basic computer skill
- Internet
- Multimedia
- Programming Language
- MS-office
- E-mail
- Website design and development

Other, please specify _____

4.2. Please rate your level of digital information literacy skill against the following factors.

1= Very Poor 2= Poor 3= Good 4= Very Good 5= Excellent

Level of Skills	1	2	3	4	5
I can recognize when there is a need for information					
I can access sources of information and obtaining the relevant information					
I can evaluate the reliability of the information and the effectiveness of the tools and strategies					
I can manage the information I accessed					
I can create new understandings and organizing information for practical application					
I can understand the economic, legal and social issues surrounding the use of information and access and use information ethically and legally					
I can identify potential sources of information					
I can develop successful search strategies					
I can integrate new information into an existing body of knowledge					
I can use information in critical thinking and problem solving					

4.3. How do you rate your digital information literacy personal skills?

1= Strongly disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly Agree

Digital Information Literacy Skills	1	2	3	4	5
Be able to recognize, articulate, and characterize what is needed to know as one approach a problem, project, writing assignment or other research task					
Be able to access needed information effectively and efficiently independent of form or format					
Be able to evaluate information and information sources critically					
Be able to use information effectively to accomplish a specific purpose as well as to retain selected information as part of accumulated knowledge					
Be able to manage and organize information effectively and efficiently using information technologies					
Be able to produce and create structured electronic documents that successfully express their ideas for a specific audience and situation					
Be able to manipulate and use information in the format of audio visual using information technologies					
Be able to collaborate appropriately and effectively using information technologies					
Be able to successfully communicate produced content using information technologies					
Be able to participate as informed members of the academy who understand major legal, economic, social, ethical, privacy, and security issues related to information technologies					
Recognizes that accurate and complete information is the basis for intelligent decision making					
Knows how to locate needed digital information					
Formulates questions based on information needs					
Accesses sources of information including computer based and other technologies					
Evaluate information no matter what the source is					
Organizes information for practical application					

4.4. How do you rate digital information literate person?

1= Strongly disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly agree

Personal Competency	1	2	3	4	5
Finds information to form a personal standpoint					
Critically analyses information - trying to reveal values					
Has acquired mental models of information systems					
Initiates a process					
Works towards going new insights					

4.5. Do you think deficiency in digital information literacy skills can affect your academic work or research?

Yes No Don't Know

4.6. What should be done to fill the deficiency in digital information literacy skills?

Short term training Long term training Self-learning
 Workshop Continues training by the university library
 Other, please specify _____

4.7. What difficulties do you usually face in retrieving relevant information for your academic work or research?

1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly agree

Information use difficulty	1	2	3	4	5
I have difficulty to recognize the information needed					
I have difficulty to access and obtain the information					
I have difficulty to evaluate the reliability of the information and the effectiveness of the tools and strategies					
I have difficulty to manage the information I accessed					
I have difficulty to apply and create new understandings					
I have difficulty to understand the ethical use of information					

4.8. How helpful it digital information literacy in your academic work or research?

Extremely helpful Very helpful Somewhat helpful
 Not very helpful Not all helpful Don't Know

5. Factors that affect digital literacy skills acquisition and development

5.1. What are the factors affecting digital information literacy skill development?

1= Strongly disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly agree

Factors affecting skill development	1	2	3	4	5
There is university library training program on how to use the library					
Confidence and belief in own ability (self-efficacy)					
Personal interest/motivation to collaborate and share					
There is work load/responsibilities/shortage of time					
Technological skills as well as the investigative and critical thinking					
Educational level					

5.2. How do you rate the following factors affecting digital information literacy skills acquisition?

1= Strongly disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly agree

Factor affecting skill acquisition	1	2	3	4	5
Lack of institutional strategy/policy					
Lack of institutional motivation and commitment					
Unavailability of ICT infrastructure					
Shortage of skilled power					
Limited electronics resources usage					
Technical support mechanisms unavailable					

6. The relationship between digital information literacy and academic competencies

6.1. How do you rate digital information literacy against academic competency?

1= Very Poor 2= Poor 3= Good 4= Very Good 5= Excellent

Competency	1	2	3	4	5
I can work on my assignments and projects without difficulty					
I can write a report without difficulty					
I can conduct research effectively					
I can perform tests and exams well					
I can use social communication media for academic use					
I can communicate my works using appropriate technology					
I can use the electronic learning platform without difficulty					
I can evaluate electronic resources before use					
I can understand my information need					
I understand that all my decisions should be based on evidence					
I can choose the right tool to find, use, or create information					
I can use online tools and websites effectively to find and record information for later use					
I can use advanced search options to limit & refine my search for better result					
I can filter large numbers of search results quickly					
I can easily and quickly scan / skim a web page to get to the key relevant information					
I can keep myself up-to-date with information from authoritative people or organizations					
I can assess whether an online resource (e.g. web page, blog, wiki, video, podcast, academic journal article) or person is credible and trustworthy					
I can follow proper referencing style					
I can keep a record of the relevant details of information I find online					
I can use social bookmarking to organize and share information					
I can share files with others					

6.2. Please indicate the degree to which each of the following applies to you.

1= Very low 2= Low 3= Average 4= High 5= Very high

Action	1	2	3	4	5
Move into situations which require me to apply more sophisticated information-gathering skills					
There is increasing demand of skill development as the invention of new technologies is ever increasing for academic purposes					
Need to develop digital information skills in relation to the location, retrieval, analysis and application of information (order to support and teach other people).					
Increase confidence in using digital/computer technologies to prepare to create digital information					

6.3. In your opinion, what could be done in terms of initiatives and actions necessary for improving digital information literacy in general? _____

Thank you for your cooperation in completing this questionnaire!!!

Appendix II

Interview for Library Directors and ICT Directors

1. What do you understand by “digital information literacy”?
2. What is your opinion about digital information literacy’s relevance in education, research and services?
3. When do you think digital information literacy skill should be introduced in education?
4. How do you want digital information literacy to be taught, as a separate course (stand alone) or as part of curriculum? Please give reason(s). And who should have the responsibility of teaching it (IL), librarians or faculty?
5. What challenges do you think can hinder digital information literacy skill? And what could be done to improve it?
6. What do you think are the benefits of being “information and digital literate” in a higher learning institution?
7. What is your view on the prospect of digital and information literacy in Ethiopian higher learning institutions, with national or institutional initiatives, strategies, etc...
8. What is your final comment or suggestion regarding digital information literacy skills in your institution?

Thank you for your cooperation!!!

Appendix III

Observation Check List

No	Services	Yes	No	Remark
1	Availability of ICT tools and enough infrastructure			
2	Availability and usability of Internet connection			
3	Availability of wireless connection			
4	Availability of different e resources			
5	Availability of resource discovery tools such as search engine, online research gateway and web OPACs			
6	Availability of Web 2.0 tools such as multimedia, blog/wiki and social media			
7	Availability of using online tools and websites to find, share and record information online			
8	Availability of digital library system			
9	Availability of electronic journal, electronic database			
10	Availability and accessibility of institutional repository			
11	Availability of desktop computer and internet connectivity for students in the library for staff in the office			
12	Availability of every staffs have their own Laptop			
13	Digital information literacy skill training mechanism			