Jimma University
College Of Natural Science
Department of information science

Investigating Status of Electronic Publishing and Scholarly Communication among Academic Communities in Ethiopia Higher Learning Institutions

A Thesis Submitted to the Department of Information Science of Jimma University in Partial Fulfillment of the Requirements for the Degree of Master of Science in Digital and Electronic Resource Management

BY: Mniyichel Belay

Principal Advisor: - Getachew Bayissa

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As members of the board of examining of the MSc thesis open defense examination of the above title, we members of the board (listed below), read and evaluated the thesis and examined the candidate.

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Declaration

I, the undersigned, MSc Electronics and Digital Resources Management student declare that, this thesis is my original work in partial fulfillment of the requirement for the degree of Master Science in Electronics and Digital Resources Management. Where other peoples work has been used, it has been carefully acknowledged and referenced in accordance with the requirements.

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This thesis work has been submitted to Jimma University, College of Natural Science, and Department of Information Science with our approval as Advisors on the MSc in Electronics and Digital Resources management

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Abbreviations/Acronyms

AAU Addis Ababa University

AGORA Access to Global Online Research in Agriculture

AJOL African Journals Online

BOAI Budapest Open Access Initiative

COAP Coalition of Open Access Policy Institutions

CODESRIA Council for the Development of Social Science Research in Africa

DTP Desktop Publishing

DOAJ Directory of Open Access Journals

EDRI Ethiopian Development Research Institute

EIFL.net Electronic Information for Libraries

ETD Electronic Theses and Dissertations

Fedora Flexible Extensible Digital Object Repository Architecture

FTE full-time equivalent

HINARI Health InterNetwork Access to Research Initiative

ICT Information and Communication Technology

IDR Institute of Development Research

IES Institute of Ethiopian Studies

IFLA International Federation of Library Associations and Institutions

ILRI International Livestock research Institute

INASP International Network for the availability of Scientific Information

JISC Journal Authors Survey

JSTOR Journal Storage

LRG Local Research Grant

MOE Ministry of education

OA Open Access

OAI Open Archives Initiative

OAI-PMH Open Archive Initiative Protocol for Metadata Harvesting

OARE Online Access to Research in the Environment

OpenDOAR Directory of Academic Open Access Repositories

PERI Program for the Enhancement of Research Information

Pg Postgraduates

R&D Research and Development

SPARC Scholarly Publishing and Academic Resources Coalition

SPSS statistical package for the social science

UNEP United Nations Economic Commission for Africa

UNECA United Nations Economic Commission for Africa

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Abstract

The aim of this study was to investigate status of electronic publishing and scholarly communication among academic communities in Ethiopian higher learning institutions in order to device mechanisms of enhancing the teaching/learning, research and service processes through use of this mode of e-publishing and scholarly communication. In the first instance, a semi-structured questionnaire was used to collect data from 374 respondents selected using the simple random sampling from a population of 1279 from three public universities in Ethiopia. The interview involving 35 librarian and ICT directors were also conducted to complement the questionnaire survey. The descriptive and inferential statistics of the Statistical Package for Social Sciences (SPSS) were used for data analysis. The result of the study shows that Ethiopian higher learning institutions suffer from lack of adequate access to scholarly literature. There is also lack of scholarly communication outlets to publish and disseminate their research results. This study reveals that the current scholarly communication system in Ethiopian higher learning institutions is facing critical technological and social challenges. E-publishing and smooth scholarly communication is proposed as a viable alternative for Ethiopian higher learning institution. The research indicates that if Ethiopian universities and research institutions adopt open access policies and strategies, it would help them improve the access and dissemination of scientific research results. A concerted effort is required from administrators, librarians, researchers, funding agencies and government to implement and fully harness scholarly communications in Ethiopian higher learning institutions. It was concluded that respondents' general perceptions about scholarly communication through e publishing was very positive signifying the acceptance of this mode of information access in the study areas. Current poor research conditions and researchers' low Internet self-efficacy such as inadequate information search and online publishing skills were cited as the main hindrances for researchers to use locally published e-resources. The study recommends institutionalization of e-publishing in Ethiopian public universities and other similar research institutions so as to improve the dissemination of research output emanating from their legally authorized operations or missions.

Key Words: Institutional repositories, electronic publishing, higher learning institution, scholarly communication, Ethiopia.

Chapter One

1.0 Introduction

1.1 Background of the study

E-publishing and Scholarly communication is the way in which knowledge, research paradigms and ideas are formulated, shared, transmitted and disseminated and preserved in electronic format (Teffera, 2003). Bernard (2008) argues that scholarly communication helps to spread and share information about results, methods, new research products in the academic community and facilitates the findings to be shared and evaluated by colleagues. He points out that scholarly communication facilitates societal recognition for the author and establishes claims for the ownership or priority of a certain discovery. Scholarly communication uses diverse avenues and venues. They may be formal and informal, direct and indirect, physical and virtual but they all transmit between partners from similar or related fields. Smith (2006) claims that research findings can be recognized as scientific as long they are validated in an appropriate scientific forum. This validation occurs when there is an exchange in a scientific community, before general dissemination. One of today's most rapidly evolving and pervasive aspects for higher institution is the growth of produced material appearing first, or only, in electronic/digital format; this is particularly true for electronic publishing and scholarly communication (Geoffrey, 1999).

Electronic information resources have expanded from a few dozen computerized bibliographic databases to include the overwhelming diversity of services and products created by the electronic publishing industry (MacColl, 2002). These are available in digital formats like CD-ROM and DVD, as well as through on line. In parallel, new publishing models using the locally developed system (i.e. institutional repository), is being evolved, within the scholarly communications environments.

Scholarly communication is a broad term reflecting various processes through which academic communities exchange information with each other in the way of knowledge creation and dissemination. The 'traditional' system of scholarly communication is said to have originated as an exchange of information among scattered peers until Electronic publishing came into

existence (De Beer, 2005). At the same time, Electronic publishing as part of their strategy to attract users, are making freely available, high quality, current and authoritative material as well as supporting the development of smooth communication, etc. They are even creating online communities around an area of shared interest, which is a resource covering a wide range of information. It has impact on the traditional scholarly communication system and changing our notions of what e- publishing means by modifying the way academic communities produce, communicate and access information. The advent of electronic publishing has been heralded as breakthrough technology that can revolutionize the way that the academic community communicates and disseminate information (Kist, 1989). More over Electronic publishing is new types of digital resources have had an impact on the traditional scholarly communication system and are changing our notions of what e- publishing means by modifying the way academic communities produce, communicate and access information.

Some print based formats such as journal articles have migrated quite easily to the digital world. However, these types of formal publications are only a part of the universe of online digital academic resources. The online world has created the possibility for a broad range of diverse digital academic resources to be made available through the Internet. Universities are finding new ways to capture manage and disseminate these scholarly electronic resources and institutional repositories which have been proposed as a tool to aid academics to manage and distribute their digital materials.

Currently, Ethiopian higher learning institutions generate scholar document such as grey literature, technical reports, pre/post-prints, educational material, archives, directories of academic expertise, library and computing resources, laboratory facilities, electronic catalogs of print and non-print collections, images, maps, moving pictures and multimedia resources, primary data archives, sound files, web sites, search engines, resource discovery tools, finding aids, software, records of lab experiments, finances and conference proceedings, including digital video presentations. However, they are not accessible to the users, because of low trend of e-publishing and scholarly Communication

Thus, this research would aim to investigate on the status of electronic Publishing and Scholarly Communication to academic performances in Ethiopia higher learning institutions.

1.2 Statement of the problem

An important outcome of the digital environment has been the creation and publication of digital scholarly materials on the Internet/ locally implemented open sources software by members of the academic community that in turn has led to a growth in the amount and variety of electronic resources available. Moreover it facilitates the teaching and learning process. E-publishing and scholarly communication ensures exchange of scholarly documents between academic communities.

Higher institution in both developed and developing countries have a role to play in the e-publishing and scholarly communication process for the advancement of knowledge. According to Chan .(2004), scholarly communication can only be considered complete when two sides of the world – developed and developing countries participate in that process. The process of scholarly communication is however more constrained in developing countries than it is in the developed countries (Moller, 2006).

The most commonly reported problems affecting scholarly communication in developing countries have been outlined and discussed in several studies (Mutual, 2009). Based on the cited studies, the following are the highly reported, such as low funding for research and higher education, low staff morale due to low salaries and unrewarding research system, brain drain, overburden of researchers with teaching and administrative loads, low exploitation of information and communication technologies (ICTs), and perceived bias against the existing mode of publishing.

In Ethiopia for example, study by Getaneh (2008) revealed that the scholarly communication system is very weak. Especially in higher institution where there is no institutional repository to archive research results. The low open access uptake has also attributed to both social and infrastructural challenges.

In recent years, higher learning institution technological developments and the availability of information resources have brought a sea-change in how scholarly documents are produced and how its results are communicated among the academic communities. However Ethiopian higher institution have gap in e-publishing and scholarly communication process for the advancement of knowledge sharing. Such as limited access and disseminating of scholarly documents, insufficient skill and infrastructure for proper managing and disseminating of scholarly document.

E-publishing and scholarly communication in Ethiopia higher institution have still problem with managing , dissemination and providing access to increasingly produce of materials, because of absence of e-publishing outlet/platform such as institutional repositories ,open journals system, insufficient infrastructure such as inadequate technological support , lack of national and international visibility, lack of access to scholarly communication documents, lack of research strategy, institutional copyright policy, e-publishing policy, fear of the unknown by the researchers (impact on scholars), the value of public image, economic value, research value, loss of valuable records, lack of open access and related issues which has tremendous impact on scholarly communication.

In particular it is important to study the resources found within e-publishing that are outside the framework of traditional scholarly publishing, as there is a limited understanding of their function and impact within the scholarly communication system. Scholarly communication not only allows researchers to disseminate traditional information resources such as reports, articles and working papers but it also opens up the possibility for the development of new kinds of scholarly materials. There has been less research into the possible impact of novel types of digital genres on e-publishing and these would have implications for the way of scholarly communication and publishing work

1.3 Research question

This research study answers the following questions

1. What are the existing and future major challenges and opportunity to build up electronic publishing and scholarly communication?
2. What are the current trends and models of e-publishing and scholarly communication?
3. What are possible factors affecting e publishing and scholarly communication?
4. What are the benefit of e-publishing scholarly communication on the teaching/learning, research and service activities in the universities
5. What are the differences and similarities between the universities regarding e-publishing and scholarly communication

1.3 Objectives

1.3.1 General objectives

To investigate the status of e-publishing and scholarly communications among academic communities of Ethiopian higher learning institutions.

1.3.2 Specific objectives

The specific objectives of the study are:

- To assess the existing and future major challenges and opportunity to build up electronic publishing and scholarly communication
- To identify the current trends and models of e-publishing and scholarly communication.
- To find out possible factors affecting e publishing and scholarly communication
- To understand the changes those are occurring in the academic community in the production and dissemination of scholarly documents.
- To find out whether there are differences or similarities of scholarly communication practice among the universities.

1.4 The Scope and limitation of the study

This research gives emphasis on investigation on the status electronic publishing and scholarly communication among academic communities in Ethiopia higher learning institutions. The study focused on Ethiopian higher learning institutions. The sampling frame included students and academic staff of the selected universities, namely Jimma University, Addis Ababa University and Wolkite University. There are many elements that help to address e-publishing and scholarly communication. Among them are institutional repository and digital library, accessibility and ICT technology use were the main variables of this study. Thus, the scope of this study was limited to the three universities (AAU, JU, and WU) and the above mentioned variables.

1.5 Significance of the study

The ultimate intention of the study was to recommend suitable measures for effective exploitation of e-publishing and scholarly communication potentials to improve the teaching and learning process in the universities involved in the study based on the emerging findings. The study findings might thus help universities in the study area to make informed decisions on improving scholarly communication for high quality and more research impact. Likewise, other academic and research institutions in the country, the region and in the developing world at large with similar operational environment but which are not covered by the study may also benefit from the study findings

The existing system of scholarly communication is undergoing profound transformations, the impacts of which are far from clear. In the academic area there are numerous research initiatives underway in order to implement new and effective models of scholarly communication. In higher institution, there is an unacceptable lack of research and supporting infrastructure aimed at creation and dissemination of electronics and digital resources. To gain a better understanding of the consequences of the changes to the scholarly communication system, there is a critical need for a research. This research would serve as the basis for the development of effective scholarly communication, as well as the basis for sound strategic planning to electronic publishing.

This research would look at the current trends in the electronic publishing and scholarly communication of Ethiopian higher institution. Particular emphasis would be given to understanding the changes that are occurring in the electronic dissemination of scholarly information and how academic communities would need to manage these changes. Scholarly communication genre and its underlying components would be referred. It also provides an opportunity to focus on the quality and accessibility of the electronic publication flowing through the cycle and the communities who both create and use the information. Hence, It add value on the knowledge of using electronic resources through electronic publishing and scholarly communication because today a number of electronic resources such as, research paper, lecture note, journals are produces by students, staff and researcher but they lack the how knowledge to disseminate these knowledge which indirectly imply as the barrier for e-publishing and scholarly communication.

The study would be create awareness and knowledge about the challenges of scholarly communication; educate and inform students, and campus administrators about the issues; helping postgraduate students to understand their rights as creator and contribute content to publishing; advocate for developing sustainable models of scholarly communication; helps to understand the basic principles that characterize the electronic publishing system and the effect they have on access to knowledge; and it enables researchers in higher institution how to access research produced elsewhere and disseminate and share their research findings, both locally and globally, hence encouragement knowledge sharing and collaboration. The study also investigates the specific benefits of open access for academic researchers.

1.6 Operational Definitions of terms

It becomes necessary for some concepts that form the basis for this topic to be defined. Such concepts include: electronic publishing, scholarly communication and communication.

Electronic publishing: Kist (1989) defined electronic publishing as "the application by publishers of a computer aided process, by which they find, capture, shape, store, and update information content in order to disseminate it to a chosen audience". Kist pointed out that this definition makes no distinction between the manufacturing process and the disseminating

process. Less than a decade ago the term electronic publishing identified an activity that is now referred to as desktop publishing, in which information is stored and formatted electronically, but manufactured and distributed by traditional paper based methods.

Scholarly communication: Brown, (2006) defines scholarly communication as the life-blood of the university's teaching and research mission. With the advent of new technologies, the nature of scholarship and scholarly communication has expanded beyond traditional print formats to include other means of dissemination: email, pre-print servers, e-journals, e-books, and e-reserves, distance learning, etc. In an online environment, issues of copyright, intellectual property rights, and the long-term preservation of digital assets are posing new challenges to faculty, administrators, and librarians

Open Access: Open access is defined as the mode of scholarly communication aiming at wide distribution of scholarly content with neither price nor any other copyright restriction (Chan and Costa, 2005; Yiotis, 2005). Within the context of this study two main avenues of open access are distinguished namely: Open Access Journals (OAJs) and Open Access Archives/or Open Access Repositories (OAAs)/ (OARs).

Researchers: Kothari (2004) defines research as "the systematic method consisting of enunciating the problem, formulating hypothesis, collecting the facts or data, analyzing the facts and reaching certain conclusions either in the form of solutions towards the concerned problem or in certain generalizations for some theoretical formulation". Researchers are thus individuals involved in conducting research. Within the context of this study, researchers are comprised of fulltime university affiliated academicians involved in various research undertakings at their respective universities.

Scholars: These are individuals undertaking research as well as being involved in the scholarly communication process. In other words, these are the people considered to have accumulated research knowledge in their areas of specialty and have been involved in dissemination of their research findings using either peer reviewed publishing outlets such as journals, books, or other formal dissemination means including theses/dissertations and conference proceedings**.**

Grey Literature: According to the Encyclopedia of Information and Library Science (1993), grey literature refers to literature "that has not undergone the formal publishing process [not

listed and not priced] and is normally difficult to trace especially if not available online". Within the context of this study, grey literature includes: theses/dissertations, conference proceedings, research reports and any other publications that have not undergone the formal publication process but are of research interest.

ICT: It is computer technologies that constitute a major part of education programs in higher education (Aparcio, 2000).

Education: The process of teaching and learning usually at school, college or university.

Higher education- is education at university or similar educational establishments, especially to all level

Scholarly publishing is a means of communicating scholarship within a community. In the context of electronic media, the term 'scholarly publication' commonly refers to all forms of online distribution of documents (Kling & McKim, 1999; Borgman, 2000).

Chapter two

2.0. Literature Review

2.1 Define electronic publishing and scholarly communication

2.1.1. Electronic publishing

Electronic Publishing is the process for production of typeset quality documents Containing text, graphics, pictures, tables, equations etc. Electronic Publishing can be represented as;

EP = Electronic technology + Computer technology + Communication technology + scholarly documents

Kist (1989) defined electronic publishing as "the application by publishers of a computer aided process, by which they find, capture, shape, store, and update information content in order to disseminate it to a chosen audience. Kist pointed out that this definition makes no distinction between the manufacturing process and the disseminating process. Less than a decade ago the term electronic publishing identified an activity that is now referred to as desktop publishing, in which information is stored and formatted electronically, but manufactured and distributed by traditional paper-based methods. Kist claimed that the term electronic publishing (which can include any single aspect digital storage, manufacture, or transmission of a publication) is now so broad that it is usually meaningless

Browning and Lynch (1985) took a very different approach to defining an electronic publishing. Their insightful article began by making a clear distinction between electronic production and distribution of information. The authors distinguished between what they called Newtonian (Gutenberg/paper-based) publishing and quantum-mechanical (electronically transmitted) publishing. They concluded that much of what is currently labeled electronic publishing is actually traditional Gutenberg-style publishing carried out by modern methods. Their thesis was that electronic publishing is a delivery medium: that publication is an action and process rather than an artifact. This idea seems to have some merit.

One of the most complete definitions of electronic publishing appears in a popular electronic encyclopedia (Grolier Electronic Publishing, 1995). This wholly electronic publication defines electronic publishing this way ”Sometimes used to describe the application of computers to

traditional print publishing--from word processing to computerized order processing--the term electronic publishing refers more precisely to the storage and retrieval of information through electronic communications media. It can employ a variety of formats and technologies, some already in widespread use by businesses and general consumers, and others still being developed. Electronic publishing technologies can be classified into two general categories: those in which information is stored in a centralized computer source and delivered to the user by a telecommunications system; and those in which the data is digitally stored on a disk or other physically deliverable medium. The former category, including online data base services and videotext, represents the most active area in electronic publishing today**"**(Lynne ,2003).

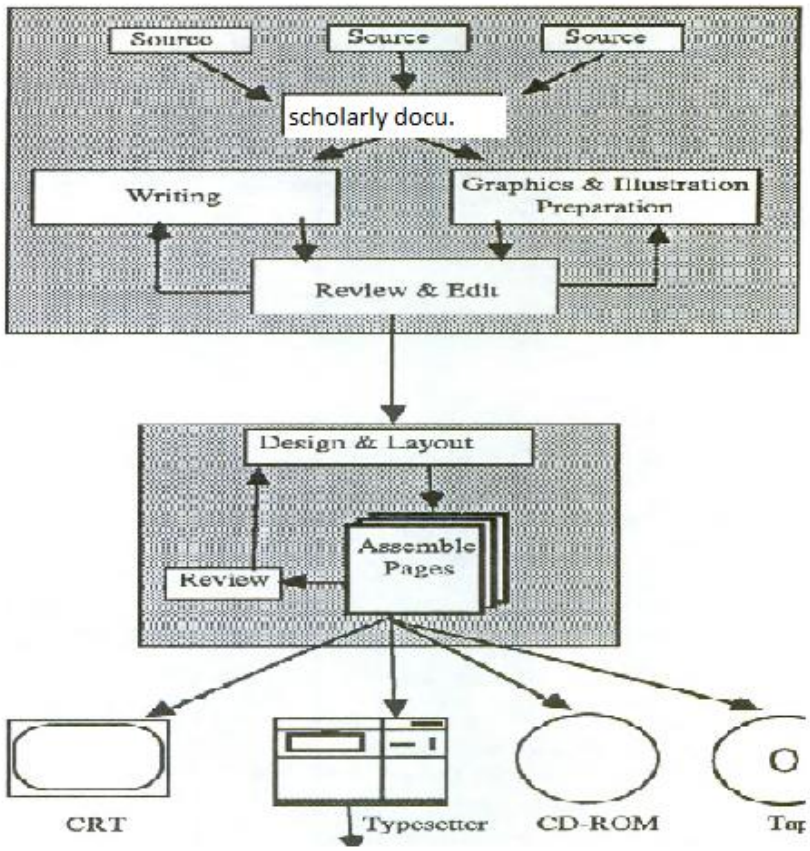

Figure 2.1. Electronic publishing process, by Lynne (2003)

Electronic mail (E-mail), compact disc read only memory (CD-ROM), and electronic journals (E-journals; online journals) are common everyday terms that only originated in the 1980s. Yet, these words are increasingly found in everyday conversations of people of all ages, professions, countries, and businesses. Electronic publishing has revolutionized the way we think, talk and

act. In less than 20 years, changes in communication and information management (the essence of electronic publishing) have become so profound that the era we now live in is called information age. An age that is not completely understood by many of us living in it, but would be scrutinized by historians and studied by school children as the Industrial Revolution and Space Age have been examined by current generations. Of importance to communities, other professional and user experiencing this latest era of change is how electronic publishing is altering and reforming how we communicate and control information in our lives.

Electronic publishing has been broadly defined as non-print material that is produced digitally. Electronic publishing is an encompassing term for a variety of digitally produced materials (Jones & Cook, 2000) such as bulletin boards, newsgroups, mailing lists, CD-ROM based media, and websites. Material produced electronically can be classified into two major categories that are not mutually exclusive: communication and information management. CD-ROMs and websites are often categorized as information management, while others like newsgroups/forums and mailing lists can be grouped as a means of communication. The differentiation often lies in whether the central purpose is sending messages (communication) or store-housing knowledge or resources (Glassick, 1997).

CDs, for example, may store information, such as data from a book or encyclopedia. An increasing number of nursing textbooks include a CD for the buyer and included on the CD are supplemental text material. In a like manner to CDs, information can be stored on web sites. However, instead of the computer reading a CD, the computer reads the information that is kept at the website. The Online Journal of Issues in Nursing, for example, is information that is stored at the American Nurses Association's website, (Glassick, 1997)

2.1.2 The Transition from print to Electronic format (e-publishing)

Before 1985, publishing was the purview of specialized practitioners in the publication, graphic arts, pre-press and/or printing organization. For many, publishing document meant providing these specialists with a prepared manuscript and then proofing document galleys and final pages prior to printing. There was little understanding or interest in the activities these specialists performed to produce high quality final products. However, by 1985 technical advance in the form of workstation with increased computing performance, cheaper storage media, improved

graphics displays, and new technology for reproducing image allowed to introduction of desktop publishing (DTP). Capabilities that were available only on the specialized proprietary system were now available on computing system found in every office. Virtually every personal computer user could become a publisher; producer of documents began to take an interest in the different aspect of publishing a document, performing many of the tasks themselves. Moreover they began to look for methods of streamlining the publishing processes to be more efficient and effectives' (Lynne, 2003)

The gradual transition in scholarly publishing, specifically journal publishing, to electronic forms has been heralded as a promising avenue for research, easy access to information, increased access for users in the developing world and collaboration and fluid exchange of information between the North and the South. In addition, digital journal publishing, as it relates to financial and material constraints in developing countries, has the potential to circumvent the huge cost of paper and scholarly publishing subscriptions (Hussein and Priestley, 1999).

Unfortunately, electronic publishing has been viewed with a lot of skepticism, and the anticipated acceptance of online publishing has not materialized on the continent. There is tremendous inertia in academia, some scholars swearing that nothing can substitute for browsing bound printed journals. The researcher concern is to examine factors inhibiting the transition from print to electronic publishing in Africa in spite of the challenges inaccessibility, lack of visibility, high production cost, poor print quality and inadequate circulation etc. of traditional print journals (Samuel, 2011).

After careful examination of a heterogeneous collection of propositions backed with some qualitative data, observations, reportage and in some cases personal anecdotes, two lines of arguments emerged from the literature: those who are very optimistic about new communication technology and argue that the electronic medium holds the key to bringing African scientific scholarship out of the doldrums (Adebowale, 2002; Wouldinsky, 2006, 2003; Tomlins, 1998), and those who are optimistically cautious and therefore argue that the current digital revolution has serious potential to exacerbate the gulf between the North and the South (Arunachalam, 1999; Cetto, 1998; Chan, 2004).Sulaiman Adebowale (2001), of the Council for the Development of Social Science Research in Africa (CODESRIA), holds the view that the Internet proffers great promise speed, and easy access for developing nations, "never seen in

publishing since the advent of the Gutenberg printing press and desktop publishing combined" . It debunks the argument that there is one Internet user for every 75013 people in Africa, noting that "the figure could be misleading for journal publishers in this part of the world" (Willinsky, 2006). researcher contends that Internet connectivity 13 UNDP World Development Report of 1999 estimated that there is one Internet user for every people in Africa, 3 in North America and Europe, 125 for Latin America and the Caribbean, 200 for South East Asia and the Pacific, 250 for East Asia and 500 for Arab States, 2500 for South Asia. 60 in Africa started mainly in academic institutions, a place where scientific publishing occurs, and there is little evidence that the interest of universities in Internet usage has waned. In defense of his position, the researcher quotes a survey conducted by Jean Diouf (Adebowale, 2001), which states: Eighty-five percent of researchers and libraries who use four journals published by CODESRIA have Internet access. It is noteworthy that 75 percent out of this particular group [i.e., the 85%] were from Africa alone (Ng'etich, 2004), a sociologist and anthropologist expressing similar sentiment in apaper, "Old Problem, New Strategies: Internet as a Tool for Research in Africa," believes that Africa is not only in a period of book famine but is "at the throes of digital famine" . However, he has not dispensed with the idea that the Internet has the potential to solve these problems through electronic publishing and shared virtual libraries: African scholarship has long been undermined by lack of access and visibility, but the Internet affords African scholars the opportunity to break the chain of dependence. Failure to take the opportunities might result in Internet technology reinforcing the existing dependence on Western publications electronically as well. Like many likeminded scholars, he concludes, "the ... Internet has the capacity to leapfrog Africa into the information age and narrow the information gap, which hitherto exists" (Samuel, 2011).

It should be obvious by now that the online environment portends interesting avenues for the developing world, and protagonists like Adebowale and Ng'etich and probably Willinsky, have good reasons to be upbeat for the developing world. However, bringing the literature examined to bear on this debate, it is important to bring to the fore certain caveats, the ignorance of which would make it more difficult for the Third World to take advantage of the new information and communication technologies. This is where optimistic but cautious authors argue that the mal distribution of access to ICT, computers, networks, Internet, bandwidth, socio-cultural and political factors are major issues to be negotiated, misjudgment of any one of which could further isolate the developing world and reduce their role in the enterprise of knowledge production,

dissemination and utilization (Arunachalam, 1999; Cetto, 1998; Teferra, 1998; Rosenberg, 2005).

As noted, it is a fact that a great deal of effort has been made to give to the research community in Africa access to growing quantities of electronic information resources.

In 2004, INASP commissioned a survey of university libraries in English-speaking Africa. The purpose was, among other things, to provide an overview of the current state of digital libraries that are capable of supporting research universities. Below are some of the rather distressful findings. Of the state of ICT, Rosenberg (2005) says, "an adequate ICT infrastructure with a sufficient number of networked and Internet-connected workstations is essential if a library is to offer access to e-resources and develop e-services." Yet 55% of the libraries in the study had a ratio of less than one computer to every 100 full-time equivalent (FTE) students, and 36% had a ratio of less than one computer to every 500 FTE students. Only 35% of libraries had 75% of their computers connected to the Internet, and 15% are not connected at all. Of bandwidth, the report indicates that many universities in Africa have an Internet connection of between 512 Kbps and 1.544 Mbps. Comparing this finding to what is available in the developed world, INASP reports that the current level of bandwidth in most African universities (512 Kbps to 1.544 Mbps) is what is typically used to connect individual homes in the West and cannot compare to Bristol University that uses a 2.5 Gbps link, which is 5120 times more than what the University of Dares Salaam has (Teferra, 1998).

The University of José, one of the better-connected universities in Nigeria with a student population of 13,000, according Miner and Missen (2005), shares a single satellite connection, which provides 128Kbps, whereas the University of Iowa enjoys a 300Mbps connection to the Internet. The maximum data that a lecturer can download in the University of Jose is 128,000 bits of information per second, whereas a lecturer at the University of Iowa is able to download 3,000 million bits of information per second. Teferra (2003) observes that, in some countries, bandwidth for Internet access is very small, and downloading large files, even those that do not contain graphics and images, can be expensive and slow even if the information itself is free(Meissen, 2005).

When it comes to cost, Tefera (2003) reports the following: Makerere University pays about $22,000/month for 1.5Mbps/768Kbps (in/out), Eduardo Mondlane pays $10,000/month for 1Mbps/384Kbps, while the University of Ghana pays $10,000/month for1Mbps/ 512Kbps. These numbers indicate that African universities, outside of South Africa, are paying over $55,000/month for 4Mbps inbound and 2Mbps outbound. These figures are about 100 times more expensive than equivalent prices in North America or Europe.

In a study conducted at the six universities in Cameroon to evaluate Internet connectivity and access to both students and faculties, Willinsky, Jonas, Shafack and Wirsiy (2005) found that only 10% and 40% of students and faculty respectively had access to the university Internet. Surprisingly, the majority of faculty (76%) and students (75%) could use the Internet through public, commercial facilities rather than at the university or home. The cost of browsing at the commercial facilities for an hour is equal to a day's average wage for the Cameroonian. Most importantly, the study asserts that the commercial Internet cafés are not licensed to provide access to free or discounted journals offered through programs like HINARI, AGORA and PERii.

Other infrastructural impediments, for example, lack of funds for purchase and maintenance of hardware and e-resources, frequent power cuts, limited library space, security of computers, speed and reliability of Internet connection, low levels of ICT literacy/electronic resource use among users have debilitating effects on Africans in keeping pace with ever-changing communication technologies. These impediments cannot be ignored (Rosenberg, 2005).

Furthermore, Mine and Missen (2005) suggest that the poor human infrastructural development inadequate exposure and training of editors, academic staff and librarians in Internet and computing skills is another challenge developing countries would have to overcome in order to build research capacity through e- publishing. According to Rosenberg (2005), the most important challenge faced by university libraries in Africa is that "Library staff were said to be particularly lacking in knowledge of teaching skills (for user education), electronic resource management (e.g. subscription negotiating skills) and electronic services development. University administrators and academic staff were also found to have low level of ICT literacy."

Complementing Rosenberg's view, Zeleza (1997) and Teferra (1997) argue that most senior professionals running the universities in Africa, for example, were trained in a system that had not fully embraced fast-growing ICT, and they therefore still prefer the slow, paper-based peer-review process. Editors need to negotiate a steep learning curve when their journal goes online. Smart et al. (2004) observed that "there are no professional bodies in Africa that train editors, and only the most adventurous individual contemplates joining an (expensive) overseas professional body". They state further, "Commercially available training courses are beyond the reach of most universities and there are few, if any, courses designed to develop academic editing and publishing skills. Editors must learn by bootstrapping". Again, researchers are poorly remunerated and not properly recognized, which affects their morale and in turn affects electronic publishing.

Putting all these factors together, authors like Rosenberg, Teferra, Zeleza, Arunachalam and Pearce et al(2003). They have clearly established that, in spite of heavy donor investment, the dearth and expensive bandwidth, and debilitating economies in Africa pose structural disincentive, which has the propensity to widen the digital divide. These factors could account for some of the reasons why many countries in Africa are hesitant to make the transition from print to online scholarly publishing, in spite of the challenges with print journal publishing. Furthermore, the minimal communication technology essential for online journals and databases is lacking in many developing countries, and this is a challenge to a successful implementation of online journal publishing African countries (Teferra, 2003).

Whichever way one looks at it, the point to reiterate is that the mal-distribution of access to ICT , computers, networks, Internet, bandwidth, as well as socio-cultural and political factors are major issues to be negotiated, and the misjudgment of any one of these could further isolate the developing world and reduce its role in the enterprise of knowledge production, dissemination and utilization(Zeleza, 2003).

2.1.3 Advantages and disadvantages of electronic publishing

One of the biggest advantages is the diminution of postage and cost of the printing publishing, as well the elimination of delays in dissemination and divulgation of scientific data. They also eliminate delays in announcements, distribution and delivery. Distances and borders between different domains are erased, improving access and learning. International coverage is achieved. Swiftness of publication entails immediate access to highly important information that allows the scientific community to gain knowledge about the research projects of their colleagues in many distant parts of the world.

Other advantages are: the addition of other texts, enhance the answer power of users, easy connections with other publications, efficiency of data transmission and specialization, low production costs, lack of physical size limits (such as happens with printed materials in libraries); the practically unlimited capacity of production; diversity; transmission and reception of information in all places, without mailing costs; online access to full texts; instant reception of information; availability of multiple access points, which does not happen in the case of materials printed in paper; ability to transfer personal data; greater storage capacity than paper publishing; lower retrieval costs.

Electronic publishing have also disadvantages. One of the biggest disadvantages is the need of a networking system and the connection to the Internet. There exist large sectors of the potential readership that are unable to take advantage of networking services. This happens because of the lack of adequate equipment, support, and infrastructure, lack of good telecommunication services, inability to connect to the appropriate networks. The consequence of this is that a large number of citizens around the world, and especially in Africa remain out of the system.

Other difficulties are the additional costs of technology, the costs related to equipment maintenance and operation, the legitimacy of electronically publishing texts, the vulnerability to plagiarism, alterations and reproduction; the difficulty of determining the authenticity of texts and authors of publishing texts; the short life span of online texts, as well the issue of controlling

the versions of publishing texts, because they can be easily changed and updated without knowledge of reference sources, citations and identity of the author or authors, are also disadvantages.

The archiving and conservation of electronic publishing are still a challenge for information professionals, because nobody knows how to save texts for the future, as is commonly done with printed materials. Lack of credibility and access are also disadvantages of electronic publishing that must change to a better situation.

2.1.2 Attitude towards electronic publishing in higher institution

Over time, the academic community has relied on a series of different methods for communicating both in written form - letters, newsletter, journals, emails - as well as orally - meetings, conferences, seminars, talks, telephone, video conferencing and others. This has developed into a highly complex international structure currently in place today. As scholarly communication has expanded and increased, it has also become more complex according to (Ginsparg,1996).

The subject of electronic publishing has been treated with great skepticism, pointing out the difficulties with accessing quality, permanence, copyright, costs of computers and networks, among others; and with great enthusiasm, prophesying glorious changes and a brilliant future with cheaper, faster, democratic, universal and better forms of publishing. Early literature on electronic publishing in particular, tended to be quite controversial (Getaneh, 2011). The medium was criticized, mainly because the nature of the material is not reliable (it is easier than print for anyone to publish), it is not fixed (there is no authoritative and definitive version), it is volatile and not permanent (URLs changed, publications disappear from one day to the next), it is uncomfortable to read on screen, dubious quality (i.e. not peer reviewed) and there is no easy way to annotate the text (Grenquist 1997). Other works (Fillmore 1993; Odlyzko 1995; Ginsparg 1996; Peters 1996; Adair 1997; Grenquist 1997; Unsworth 1997; Wheary and Schutz 1997) concentrated on the more positive aspects and described the technology as a medium which

would greatly enhance communication and publishing, in particular, as it offered numerous possibilities that are not available in print format. Here write the methodology used, where they did the study and the finding they reported (Odlyzko, 1995).

Just as electronic publishing is transforming communication and information management in the higher institution and other professional sectors, so too is the profession of different fields using and in some instances leading the way in electronic publishing (Ludwick, 2000). Electronic publishing is developing as a tool in academic area and across practice areas, much as the more traditional tools of teaching and learning process. Some ways instructor's use electronic publishing is to communicate with students. Document findings; dispense advice and teach; earn continuing education credits; and keep abreast of advances and findings through reading. There are, however, differences in uses (numbers, i.e., from few to many) and applications (range, i.e., from basic to complex). Let us expand on some everyday examples that convey the variety of uses and applications (Ludwick, 2000).

Academic communities are also beginning to use information management and communication in their scholarship. Some researchers have used electronic publishing to access databases for conducting literature reviews while others have used electronic publishing to gather survey data (Murray ,1999). This data is typically gathered by sending out an electronic questionnaire or making an electronic questionnaire available on a website. Publication of electronic resources in higher institution has also increased steadily during the 1990's. However, there is no uniformity in their format, content, or scholarly nature. (Murray ,1999), describe a continuum of electronic journals from paper content transferred from a print journal to the web; to paper content with some web-only content; to electronic format only with no paper version; to fully interactive which involves hypermedia such as animated graphics, sound and moving images. The diverse content contained in electronic journals may include scholarly articles, non-scholarly articles, and reader responses to articles, editorials, book reviews, advertisements, job opportunities, continuing education offerings, data sets, and previews of research in progress. Although electronic journals currently vary in the scholarly review process of articles, there is no reason that the accepted process of peer review used in print journals cannot be used by online journals (Murray, 1999).

2.1.3 Publishing as a communicative practice in higher institution

As a communicative practice publishing is used by authors so that their work may be widely read and credited. Within the academic community there are differences in the disciplinary practices. A socio-informatics approach (Kling 1999; Kling, Rosenbaum et al. 2005) emphasizes the differences in disciplinary practices and criticizes the work that treats the academic community as homogeneous. These authors argued for field-specific valuation of different document formats (i.e. journals, reports, conference proceedings) and the publishing venues for them as well as their perceived value.

Research on electronic publishing tends to treat the academic community as homogeneous with similar communication patterns throughout. What may be true in electronic publishing for one academic community, such as the use of preprints, is not necessarily a norm in other disciplines. For example, the case of the e prints server arXiv in Physics as a successful model for self archiving (Harnard, 2001) has been criticized because it disregards the fact that unlike Physics, not all disciplines would have a history of preprints as a form of communication (Kling and McKim, 2000). Disciplinary perspective is very important, both for the producer and the user of electronic publications. It is highly likely that this would apply to electronic resources, as different subject areas, agree on different communicative forms and channels. In addition, the uptake and use of institutional repositories would also be affected by disciplinary differences. In their model of scholarly publishing as a communicative practice electronic publishing is seen as a continuum. This view is more flexible and accommodates different types of digital materials at different stages within the publication process. The degree to which a document is published can be measured by its publicity, trustworthiness and accessibility (Kling, 2000). Accessibility refers to the ease with which a document can be located and obtained. Institutional repositories' have partially been set up to address this problem by offering stewardship and long-term preservation of academic resources (McKim, 1999).

Publicity is the degree to which interested readers are aware of the availability of a document. Kling and McKim (year) argued that "publicity does not automatically and inexorably proceed from a document's availability on a global network" (Kling, 1999). IRs and OAI-PMH can make resources more available to search engines and other retrieval mechanisms but how important is

their contribution? Would institutional repositories have to engage in other types of activities, more akin to publishers, in order to promote the use of their resources?

As publishers and libraries have entered the electronic publishing world, their defined roles have also become slightly blurred. Unworthy refers to *public libraries* and *publishers*, in which they take up tasks belonging to the other. For example, libraries, such as Pro Quest, would offer their publications directly to the end user, whilst publishers, such as the University of Michigan Scholarly Publishing Office offer electronic publications. The dangers of course, is that they do not take up *all* the tasks, and for example, libraries usually lack attention to issues such as preservation and aiding users, whilst publishers are still learning marketing, distribution and working with author skills (Unworthy 2005).

2.2 Scholarly communication

Scholarly communication is about creating; disseminating and preserving scientific knowledge. It can be elaborated as: scholarly communication is the system through which research and other scholarly writings are created, evaluated for quality, disseminated to the scholarly community, and preserved for future use. Simply it is a process of publication of peer reviewed or refereed publications (Halliday, 2001).

When scholars began to communicate in writing, they in effect began documenting their work and communication. Libraries were created to facilitate the diffusion and preservation of that communication and to further its growth; they were intended to be places where scholars congregated, a nucleus of communication, both oral and written (Milne, 1999). Enhancing this purpose was the principle of compiling a complete record of the achievements of humanity. All of the functions that can be imagined for the research library of the 21st century were in place by the third century BC, only with greater simplicity. This earlier library was more than a physical site; it was the conceptual framework for a system (Osburn, 1989). The system of scholarly communication in place today has been largely determined by print technology and the social system of print technology that has evolved through the print era is now well established.

Scholars and publishers interact accordingly to widely understand and well defined practices in order to translate the results of research onto formalized and authenticated records of scholarship. Publishers and librarians interact by means of recognized, traditional processes so as to gather

these scholarly products into collections that comprise the record of scholarship. Librarians and scholars interact through formal structures that preserve and organize the scholarly record for access and use (Smith, 1999).

The success of the system of scholarly communication in the past is demonstrated by the continued, progressive advance of scholarship with the various components having generally fulfilled their responsibilities. This in turn contributed to the effectiveness of the contributions of the other components, but by the late 1980s it was generally regarded that the system was experiencing severe, if not fatal, difficulties (Arms, 1992). Arms also pointed out that while traditional methods were under stress, a plethora of technical developments, most involving computing, offered prospects for new forms of scholarly communication. When computers and, later, network technology were applied to the system of scholarly communication, a new age was heralded. Although computer solutions reduced the seriousness of old problems, these were counterbalanced by the introduction of a new set of problems brought about by the great potential of the computer. It was the enormous impact of the computer on scholarly communication and the swiftness of the change it generated that were largely responsible for the attention later given to scholarly communication as a system according to Milne (1999). Computer technology has now been adopted by all agents participating in the scholarly communication system. What the computer has made possible is the performance of many functions simultaneously and at great speed, the impact of vast stores of information into manageable formats, the facile manipulation and modification of that information, and the interconnect ability and correlation of different sets of information. When we think of information as communication, we see why the advent of the computer is such a landmark in the history of scholarly communication: it tightened the system by intensifying the immediacy of the influence of each agent upon the others (Osburn, 1989).

2.2.2 Role of scholarly communication in the research process

The advancement of research through which information and new knowledge is generated depends on the existing body of knowledge which can be said to be the work of a multitude of researchers interacting with each other through the process of scholarly communication (Sooryamoorthy and Shrum, 2005). During the research process, researchers use information as

an input and generate further information in the form of new ideas (innovations) as an output (Kaaya, 1999).

The existing pool of the generated information during past research fuels the present research and ensures that one's work is not duplicated. According to the Alliance for taxpayer access (2007), the more widely scientific results are disseminated, the more readily they can be understood, applied, and built upon for further scientific insights and breakthroughs. The process of scholarly communication is thus essential for the progress of scientific research. This implies that doing research without disseminating the findings is a waste of the limited research resources. It is therefore not surprising that most research funding agencies demand the evidence of dissemination of research findings from their grants' awardees to account for the funds spent in undertaking research. Similarly, employers such as universities use scholarly output of their academics as the main criteria in considering such staff for promotion (Xia, 2006; Christian, 2008). This view is also shared by Correia and Teixeira (2005) who point out that the award in terms of research contracts, tenure and promotions is among the motivations for scholars to publish. The fact that research output generation is also used as an indicator of the performance of individual nations and their institutions further demonstrate the importance of dissemination of scholarly output (Abrahams, Burke and Mouton, 2009; Moahi, 2009). Ideally, scholarly communication system should disseminate research results so that any scientist could easily access them without barriers of costs (Swan, 2007). Indeed that was the essence of scholarly communication and probably the reason why the scholarly societies were more concerned with making scholarly output available to the research community rather than making profits out of journal sales (Yiotis, 2005; Swan, 2007). Therefore, any scholarly communication system delaying information dissemination or imposing access barriers to scholarly work contribute to the slow progress of science (ALA, 2003; Alliance for Taxpayer Access, 2007; Swan, 2007). Limiting access to scientific research results to a small fraction of the worlds' scholarly community with subscription capability and thus leaving the rest of the scholarly community without such access as practiced in the current scholarly communication system is detrimental to the progress of knowledge. This is due to the fact that those without access to scholarly content may not effectively conduct research and thus their contribution to the progress of knowledge is likely to be negatively affected. The following section highlights some of the problems experienced by developing countries in terms of scholarly communication(Moller, 2006).

2.2.3. The role of Institutional repositories for scholarly communication and publishing

Repositories or archives would be organized around subjects (discipline-based repositories such as the http://arXiv.org) and institutional repositories (such as Tspace of the University of Toronto) (Jones, Andrew and MacColl, 2006).

Lynch (2003) contends that institutional repositories are essential infrastructure to accelerate research and scholarly communication. Lynch (2003, p.2) defines university based institutional repositories as "a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members." This definition can be contextualized to any context outside the university domain.

One essential point Lynch (2003) made is that institutional repositories requite a collaborative effort of librarians, information technologists, archives and records mangers, faculty, and university administrators and policymakers. Many universities and academic institutions have been developing institutional repositories and this development is getting momentum (Rockman, 2005). Institutional repositories include various kinds of digital objects including electronic theses and dissertations(ETD), e-prints (pre-and post-prints), learning objects, conference presentations and technical reports within an institution (Bailey, 2006).

Institutional repositories in general main contain both peer-reviewed and non-peer-reviewed digital objects such as articles, reports, presentations, images, data, even multi-media items(Barwick, 2006).

The primary goal of institutional repositories is to make the institution's intellectual product visible to users across the world through an interoperable and persistent online storage. To this end, institutional repositories use technical standards such as the Open Archive Initiative Protocol for Metadata Harvesting (OAI-PMH). This standard enables separate repositories be accessed and harvested (Pickton, 2006).

The oldest, transformative and most cited e-print archive (subject-based repository) is the arXiv(http://arxiv.org) which was launched in 1991 by physicist Paul Ginsparg at Los Alamos National Laboratory. Ginsparg later moved with his archive to Cornell University. What makes arXiv transformative is that it has achieved near 100% success in archiving eprints in selected

areas of physic. Besides, the best practises from arXiv have been adopted by other institutions (Suber, 2006). Currently, the arXiv has 528,147 open access e-prints in Physics, Mathematics, Computer Science, Quantitative Biology, Quantitative Finance and Statistics.

There are two main background reasons for setting up institutional repositories. The first is to attempt to modify the current scholarly publishing system, and tend to support the wide access movement. In these cases institutional repositories' is a strategy to improve access to traditional scholarly content in particular e publishing (Andrew, 2003).

The SPARC position paper proposes a disaggregated scholarly publishing model divided into four components: registration, certification, awareness and archiving. They argue that institutional repositories can play a more active role in these processes and thereby breaking the publisher's monopoly. Currently publishers are responsible for registering, certifying and together with libraries provide awareness and archiving functions. The paper argues that institutional repositories can register, certify, and provide awareness and archiving for e publishing.

2.3 E-publishing and Scholarly communication problems in developing countries

Scholars in both developed and developing countries have a role to play in the scholarly communication process for the advancement of knowledge. According to Chan (2004), scholarly communication can only be considered complete when two sides of the world – developed and developing countries participate in that process. The process of scholarly communication is however more constrained in developing countries than it is in the developed countries (Tise, 2010). In Tanzania for example, studies by Dulle et al (2001) and Chailla (2001) reveal that researchers (those from Sokoine University Agriculture inclusive) faced problems in accessing scientific literature.

According to Dulle et al (2001), 86.1% of 230 researchers were reported to have been facing a variety of problems in accessing scientific literature such as unavailability of current literature.

As far as research output visibility is concerned, scholars from developing countries have also been reported to contribute insignificantly to the global scholarly literature. According to Chan and Costa (2005: 142), "new knowledge is largely created in developed countries". The authors cite an example given by King (2004), indicating that researchers from eight countries (the USA, the UK, Germany and Japan as leading among the eight countries) produced 85 per cent of the world's most cited publications, while another 163 countries, mostly from developing countries, accounted for less than 2.5 per cent. Chisenga (1999) also cites a survey of the United Nations Economic Commission for Africa s hawing that Africa generates only 0.4 percent of global content and that if South Africa's contribution is excluded the figure becomes merely 0.02 per cent. Supporting the above statistics, Nwagwu and Ahmed (2009) also reported that Africa South of Sahara contributed only 0.7% of the global research output. Statistics based on the Thomson Reuters Web of Science further reveal that the research output in Africa has not improved as desired (Adams, 2010). According to Adams, King and Hook (2010), from 1999 to 2008, the whole of African continent generated 27, 000 papers per year as compared to a similar output from a single country like The Netherlands in Europe.

The most commonly reported problems affecting scholarly communication in developing countries have been outlined and discussed in several studies (Mutula, 2009). Based on the cited studies, the following are the highly reported scholarly communication problems facing the developing world countries:

i. Low funding for research and higher education;
ii. Low staff morale due to low salaries and unrewarding research system;
iii. Brain drain;
iv. Overburdening of researchers with teaching and administrative loads;
v. Low exploitation of information and communication technologies (ICTs);
vi. The serial crisis and;
vii. Perceived bias against the existing mode of publishing.

The second, third, fourth and fifth factors mainly contribute to the low scholarly output, the remaining factors either limit researchers' access to scholarly work and/or dissemination of their research output. Low funding for research and higher education in most developing countries is a result of structural adjustment policies of 1980s and 1990s which led to a shift from higher to basic education (Mutula, 2009). According to Ntiamoah-Baidu (2008), low funding for research

and higher education has a multiplier effect on the other factors affecting the scholarly communication process as listed above. For example, as a result of low research funding in most African countries, few research projects are done resulting into less research output as compared to developed countries. Similarly, low government investment in research and higher education in the developing countries results into low morale of staff to undertake research. The same reason also encourages brain drain (migration of researchers from developing to developed countries) which further reduces research capacity in developing countries. Low funding of higher education has also an implication on postgraduate training which could also boost research output in developing countries. In Tanzania for example, apart from supporting undergraduate studies, the government does not provide loans for postgraduate students which results into limited output from postgraduate research. Countries with high enrolments of postgraduate students and especially those that mandate scientific article publication for such students to qualify for graduation are likely to increase the publication output than those which solely depend on faculty research output. Less investment in postgraduate training by most African countries also implies a reduction in number of qualified researchers who could contribute in raising the research output in the continent (Ntiamoah-Baidu, 2008).

The focus of this study, which is on the dissemination and accessibility of scholarly information, necessitates further elaborate on the last three factors. The following subsections highlights on problems that directly affect access and dissemination of scholarly content in developing countries.

2.3.1 Low exploitation of ICTs

Although the situation is improving in certain developing countries, it is generally accepted that ICTs development in most third world countries including those from Africa is at its infancy as compared to the developed world (Harle, 2009). Low exploitation of ICTs due to its underdeveloped infrastructure accompanied by inadequate knowledge for it is exploitation in facilitating information access and dissemination by scholars in developing countries contribute to scholarly communication problems experienced in such countries (Tise, 2010). Therefore, scholarly communication benefits accrued from the digital environment by researchers from the developed countries exceed by far what scholars from developing countries realize. Problems of

power supply and slow Internet connectivity due unaffordable bandwidth in many African universities significantly contribute to inaccessibility to global information resources by many scholars from the developed world as well as the dissemination of scholarly content (Eke, 2010). This means that few scholars can use ICTs to access scholarly work made available on the web by other scholars. At the same time they may not make their work available to be accessed online by their peers. On the other hand, lack of skills for effective usage of ICTs where it exists also limits access and dissemination of scholarly work in developing countries. A study by Muthayan (2003) for example, reveals that researchers and librarians believed that the existing facilities and resources were not being used optimally because many academicians and postgraduate students had inadequate information technology skills. Kiondo (2004) also established that lack of skills mitigated effective usage of information resources at the University of Dare Salaam.

2.3.4 Perceived publishers' bias on scholarly output from developing countries

The present mode of scholarly publishing is said to marginalize scholarly contributions from developing countries (Durrant, 2004). It is claimed that research output from developing countries is not accepted for publication by publishers in the developed countries as they consider such scholarly work as not complying with quality standards they set (Lor and Britz, 2004). According to Kawooya (2006:4), "the biases by developed countries' publishers highly contribute to African research content being unavailable and invisible in Western electronic databases". As a result of the existing publishing system, most African researchers as well as those from other developing countries do not get round to publishing their research findings, and that if they do it is often in grey literature or in their countries or in their regional (e.g. Pan-African) journals. Thus, their contributions are not adequately visible in the developed countries and even in the developing countries due to low circulation of such publications (Britz, 2004).

While the truth of these observations remain debatable due to the fact that some scholars from the developing countries are prolific authors in western publications, it is also possible that those authors whose papers are rejected simply do not meet the required standards. Most important, is for developing countries to devise mechanisms of establishing adequate and up to standard publishing outlets that are accessible worldwide so that even authors from the developed world are attracted to publish in such outlets.

The above observations imply that knowledge created in developing countries if well captured may increase the visibility of scholarly literature from such countries beyond what is currently recorded. Chisenga (1999) and Okemwa (2004) for example, acknowledge the existence of knowledge creation in Africa and observe that its low visibility to the world largely lies much on documentation related problems. The documentation of research output in the Eastern, Central and Southern Africa region including Tanzania also reveal some deficiencies likely to contribute to the low level of visibility of scholarly information in the global information infrastructure (Matovelo and Chailla, 2005). The above sources indicate that the greater proportion of researchers' output is documented as grey literature. The major problem associated with grey literature is the limited dissemination of its content to the wider audience especially when documented and archived in print format (Chisenga, 2006).

In recognition of the importance of scholarly literature and problems faced by scholars in developing countries, efforts have been initiated to improve scholarly communication in such countries. Initiatives such as the Program for the Enhancement of Research Information (PERI) of International Network for the Availability of Scientific Publications (INASP); Health Inter-Network Access to Research Initiative (HINARI) of the World Health Organization; access to Global Online Research in Agriculture (AGORA) of the Food and Agriculture Organisation (FAO) of the United Nations; the Electronic Information for Libraries (eIFL); the Ptolemy Project from the University of Ontario; and the Online Access to Research in the Environment (OARE) scheme of the United Nations Environmental Program (UNEP) were initiated mainly to enhance the flow of information from developed countries to developing countries (Harle, 2009).

Although the above noted initiatives have been useful to recipient countries in the short term, they have been questioned on their sustainability in the long term. This is due to the fact that in most cases once donor funding ends most of such programmes also collapse. In addition, most of the programmes in question have not addressed the problem of low visibility of scholarly output emanating from the developing countries but sustain the information flow from developed countries to developing countries despite the truth that accessibility to research output from the latter is equally important. It is only a few programs such as the Bioline International and

International Network for the Availability of Scientific Publications (INASP) that have also addressed the visibility of scholarly information from the developing countries. According to Chan (2004), research knowledge from developing countries is critical, because true global understanding of science, particularly in the areas of biodiversity, emerging diseases, and sustainable environment would be incomplete without a knowledge flow from developing to developed countries and vice versa.

2.4 Electronic publishing and communication in Africa

The digital revolution that has affected the entire world has influenced Africa and caused Africans to think extensively about it. Africans were faced with the unlimited possibilities of the new technologies and with the problems that they entail, dividing themselves between those who are in favor of the adoption of these technologies and those who do not trust them. These reactions are natural and inherent to human beings. Others receive everything that causes change in life with enthusiasm by some and with skepticism or mistrust. The role of these publications in developing countries may be different from their role in developed ones. Acceptance, involvement or rejection of electronic publishing in African countries may be influenced by the way the entire process is treated and by the context. This new industry will cause the emergence of new forms of work, with new actors, new forms of commerce and new structures (Gomes, 2000).

African countries face many obstacles and difficulties in the matter access to electronic services lack of adequate supply of electricity; lack of proper equipment (easily damaged on account of adverse conditions such as humidity and dust); deficient telecommunication infrastructure; scarce and ill-qualified human resources; large numbers of poorly schooled and even illiterate people; language barriers; absence of national information policies; lack of possibility of updating obsolete equipment (Gomes, 2000).

African rural areas are in worse shape than urban areas in terms of access to information necessary for survival and to everyday life, due to difficulties of long distances, lack of energy, roads and infrastructure that may provide access to the new technologies and updated information which can improve the living conditions of rural populations. A distinct aspect that we consider relevant is that African countries, if they wish to obtain financial and technical

support from the World Bank, must follow its orders, instructions in terms of expenditures, budget restrictions, subsidy cuts (the first areas to be affected are health and education). These programs almost always do not have a euro centric view of African problems, which do not fit properly into the contexts of the different countries, nor do they consider the real needs of the African peoples (Gomes, 2000).

African countries need do adjust as far as possible to the new technologies, in order to reduce the gap between the developed and the underdeveloped countries that keep enlarging day by day, because of the technological differences. Despite we speak today in information society, in knowledge society, and the fact that information became the most precious issue, in most African countries there still is not links between science, technology, productive systems, government and society. This is caused by the weak and inconsistent relationship among science, technology and society, a fact that perpetuates the status of underdevelopment and dependence of these countries inherited from colonial times (Kirsop, 2000).

African countries must not fall behind. They must join the waves of change and the new currents of science and technology that affect the world, make their voices heard in the context of global information, and make their publications known and respected. In order for them to have access to information, they must have a minimal infrastructure, such as communication technologies, equipment, and computers, fax machines, printers and other equipment. Technology transfers must be tied in with knowledge, training and equipment maintenance. Technological evolution also changed the world of telecommunications, making them more efficient and quicker. In African countries, however, telecommunications continue to be a problem for accessing information. In many countries telecommunications are state monopolies that charge high rates, have high costs that vary from country to country and do not allow easy access to and use of electronic information. Several authors have discussed the issue of electronic publishing in developing countries, focusing on advantages, disadvantages, benefits, certainties, uncertainties and mistakes about the creation of electronic publishing.

Letshle & Lor, (2002) recognized that the need to improve access of researchers based in developing countries to scientific information and databases. This does not mean totally free access, due to the costs involved in such operations. Electronic publishing are a valuable opportunity for developing countries to promote the advancement of their scientific

communities. They allow access to information and help to reduce the technological gap between North and South. They can be a viable option for African researchers to publish the results of their research projects, the quality of which can thus be internationally recognized. This can also help the search for international donors and partners in order to obtain funding to improve on-going projects and to create new ones. The need to improve infrastructure and telecommunications in these countries has also been recognized. Communication and information technologies already exist and are in operation, even if in precarious manners. Electronic mail systems exist in some cities, but their operation is far from perfect, because of obsolete technologies, defective equipment and failures in energy supply. Neighboring countries have conducted experiences in the creation of service networks and common databases, connecting universities and other research institutions in different countries, proving that the situation can change for the better (Zell, 2002,).

Electronic publishing exist in many African countries, some of them operating better than others, on account of developmental differences among the several countries. According to Zell "reliable statistical information about Africa's book publishing output is difficult to obtain. The situation is even more difficult to determine with regard to electronic publishing". He maintained that with the possible exception of South Africa, the volume of electronic publishing in Africa was not significant and was difficult to monitor. Part of the problem concerning statistics for electronic publishing was the fact that what is understood to constitute electronic publishing varies considerably (apud Letshela & Lor 2002).

The number of African web sites has been growing recently and almost all countries have local or internationally hosted web servers and providers. Despite this, a report by the United Nations Economic Commission for Africa (UNECA) have shown that Africa generate only 0,4% of the global content in Internet. If South Africa's contribution is excluded, the figure falls to 0.02% (apud Chisenga, 2002).

According to Chishenga.(2002) the Internet access in Africa started to move very fast since 1995. The author refers to a 1998 study written by Mike Jensen about the Internet development in Africa, in which he noted at that time, that French-speaking countries were more developed in the issues of connection and access to the Internet, on account of the support provided by Canada and France. English-speaking countries were lagging behind. It can assure you that Portuguese-

speaking countries were even further behind (Chisenga, 2002).

Use of the Internet and online services in some African countries started with teaching and research institutions. In others, the pioneers were NGOs (many of them not African), starting with electronic mail services, and later including the Internet, using electronic publishing as a means to obtain information required for their operation. Online and Internet services are almost always located in larger cities, while they hardly exist in rural areas, with very few exceptions. Sometimes happens that research institutions and public agencies install online servers to be used only by the chiefs and the staff members are not allowed to use equipment and services. This type of connection without use amounts to the same as the non-existence of the connection. Showing that they pay due attention to international developments, African governments considerate now as main priority to avoid and reduce the info exclusion that jeopardize all African continent, and will jeopardize more and more if the right attitudes and measures are not taken in the right time. The creation of NEPAD (New Partnership for Africa's Development) formally adopted as the strategic framework program, which includes information and communication technology actions derived from the last Summit of the Organization of African Unity (AU), realized in July of 2001 shows these intentions (Chisenga, 2002).

African cultural richness and diversity should be expressed in local sites, in the Internet and in electronic publishing. Africans should not become mere consumers of information. They should also produce information about their own countries and place it on the Internet. African publishing companies can devise partnerships with phone and telecommunication companies, arrangements that can be mutually useful to each other, increasing their chances of survival in the digital era (Chisenga, 2002).

2.4. E- publishing and Scholarly communication in Ethiopia higher learning institution

Universities are regarded as key institutions in the process of social change and development through their roles in the production of highly skilled labor and research output [innovations] to meet the perceived economic needs. According to the Ethiopian ministry of education (MOE) stated that academic and research activities at universities provide a critical support of national development through training of competent and responsible professionals. MOE also considers the institutions in question to often constitute the backbone of a country's information

infrastructure, in their role as repositories and conduits of information through libraries, repositories, computer networks and Internet service providers.

Electronic publishing and Scholarly communication are avails more opportunities than the traditional ways of communication system for Ethiopian to improve accessibility and dissemination of scholarly content in higher learning institution. The visibility of and accessibility of scholarly documents published on internet or institutional repositories can be made easy and without restrictions. Removal of information access restrictions through electronic publishing implies that universities scholars' problems of access to scholarly work may greatly be eased. This would be particularly the case for scholars with access or disseminate their own output. However there is no any research done before which is indicate the current level of electronic publishing and scholarly communication among Ethiopian higher learning institution. So that researcher confidence. it would be address by this research. In the current system of scholarly communication, universities may be consider to have low research impact due to limited visibility of research output from individual scholars'. Despite the promising potential of scholarly communication to improve the teaching and learning processes, the new form of scholarly communication is little exploited it.

2.5. Conceptual framework

Andersen (2002) noted that scholarly communication is an area of research that has received much attention in library higher institution. In general, this research can be characterized as being centered on the literatures involved in electronic publishing and scholarly communication. Hence, this research attempted to address the major components involved in successful implementation of scholarly communications and electronic publishing such as institutional repository, archiving, open accesses, copyright and policy.

This research approach is based on the investigating the status of electronic publishing and scholarly communication. The conceptual framework is also based on review of literatures in five topics, namely: Historical background of electronic publishing and scholarly communication process, electronic publishing success factors, the relationship of electronic publishing and scholarly communication, the relationship of institutional repositories and electronic publishing for scholarly communication.

On the way towards conceptualizing the status of electronic publishing and scholarly communication among academic communities , initial observation of the researcher is that generated scholarly documents (grey literature, technical reports, pre/post-prints, educational material, archives, directories of academic expertise, library and computing resources, laboratory facilities, electronic catalogues of print and non-print collections, images, maps, moving pictures and multimedia resources, primary data archives, sound files, web sites, search engines, resource discovery tools, finding aids, software, records of lab experiments, finances)and information and communication technologies (institutional website or locally developed open sources software) cannot directly affect academic communities as a whole, nor the substance of research in particular. They may do so only indirectly, either influencing the scholarly communication system via computer mediated or facilitated communication or through changes in the new research tools. This study focuses on electronic publishing and communication, not on tools (i.e. institutional repositories') the core of this research therefore links scholarly documents which are produced by institutions and ICT to three interrelated elements (Figure 2.1). A rounded corners box, labeled "changing scholarly communication system" contains central ("change") model of the evolution of the traditional Scholarly communication to the future state of communication . An ellipse labeled "usage among academic communities at large" represents the effects these changes have on scholarly communication in particular, and the whole communication related structure of academia, at large. A second ellipse stands for the "benefited for communities. How the researcher conceptualize the changes of electronic publishing and scholarly communication among academic communities in general. The following outlines the basic elements of this "model", which would be specified in detail in the following sections.

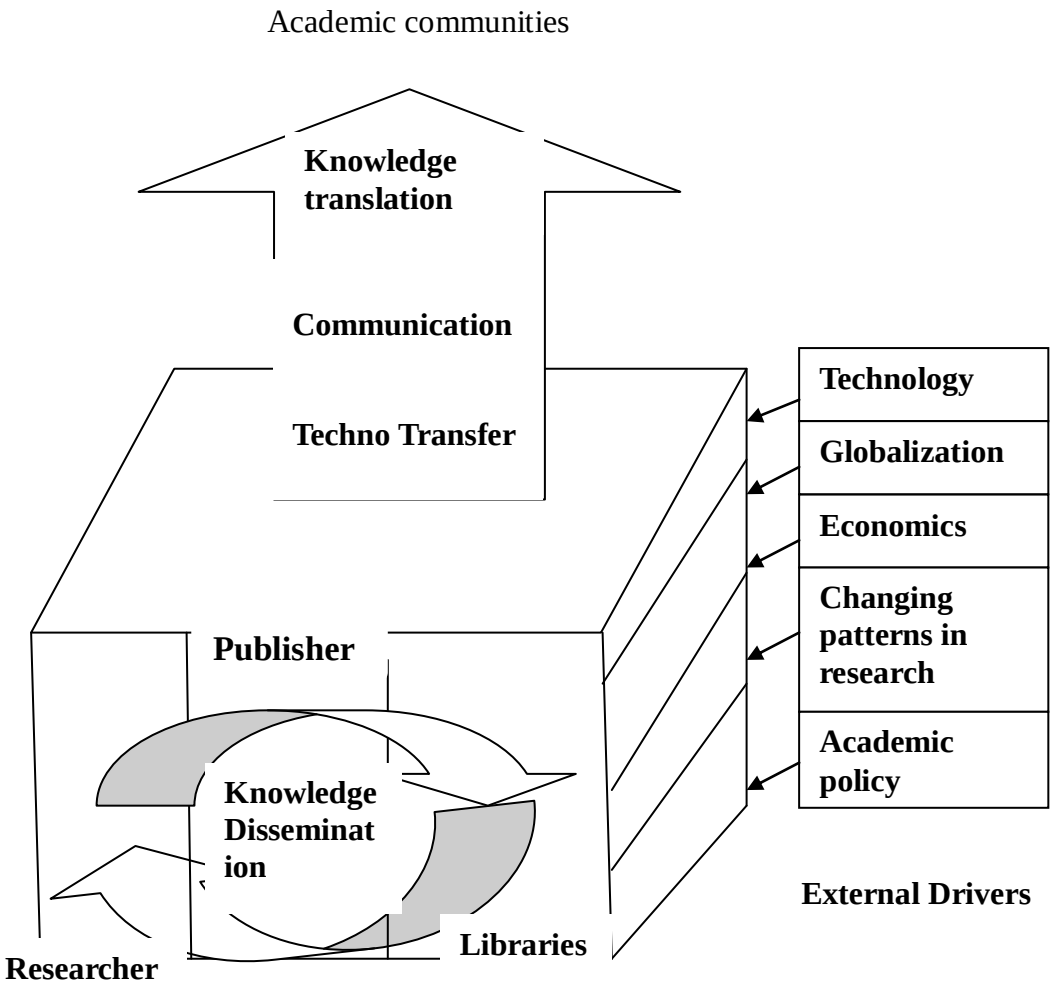

Figure 2.1. The concept of changing electronic Publishing and scholarly communication

Chapter Three

3.0 Methodology

3.1 Research Design

The method used for the study was mixed research method which helps in order to collect data on a specific place and time to observe the feelings and opinions of the respondents. Both qualitative and quantitative data were collected. Qualitative dimension refers to data that would be collected from librarian and ICT professionals through interview whereas, quantitative data that would be collected from academic staff and postgraduate students using questionnaire.

3.2 Description of the study site

There are 33 universities established in different parts of Ethiopia. Out of 33 universities 21 were relatively formerly established and 12 were established recently. Twenty one of them are experienced on developing and using digital resources and relatively advanced on the use. According to this the study would be conducted on Wolkite University from recently established university and on Addis Ababa University and Jimma University from formerly established university. By geographical location Wolkite University located south west of Ethiopia in Southern Nation and Nationality regional state in Gurage zone about 200KM from Addis Ababa. Addis Ababa University is located in capital city; Addis Ababa which is located 352KM from Jimma town. And Jimma University is located in south west of Ethiopia in Oromia regional state in Jimma zone in Jimma town, which is far about 355KM from Addis Ababa.

3.3 study population

The study targeted a population of 12791 were Postgraduate (PG) student and academic staff of three universities (i.e. AAU, JU, and WU). The total population size for this study was listed in table below:

Table 3.3.1 the total population size of the study.

No	University	Postgraduate	Academic Staff profile	Total
1.	AAU	7663	2330	9993
2	JU	1290	1341	2631
4	WU	0	167	1629
	Total	8953	3838	12791

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

3.4 Inclusion and exclusion criteria

3.4.1 Inclusion criteria

The target group that was considered as the population of this study is only above all regular postgraduate students and all academic staffs. Because scholarly documents are mostly produces, by those group. The main motivation for involving this group in the study is due to the fact that they are responsible with the production and dissemination of scholarly documents likely to influence the e-publishing and scholarly communication processes in such institutions. Moreover this category of respondents were considered to be more informed on academic matters (especially current issues on scholarly communication) than those who were mostly involved in the universities

3.4.2 Exclusion criteria

Based on the low level of producing scholarly documents and e-publishing all were Administrative staffs and undergraduates students excluded in the study. The assumption that they are not much experienced with e-publishing and scholarly communication and therefore their contribution to this kind of study could be minimal.

3.5 Sample Size determination and sampling techniques

3.5.1 Sampling technique

There are a number of methods used to determine sampling size of a study. The researcher used purposive sampling technique to select a sample size of 35 respondents from different

professionals or experts who have knowledge about electronic publishing and scholarly communication. Those respondents were, IT professionals and librarian's and simple random sampling technique was use to select a sample size of 110 academic staffs and this same sampling techniques was used to select 264 samples from postgraduate students.

3.5. 2 Sample size determination

The total populations identified for this study form selected universities are 12791. From this total number of populations 8953 are postgraduate and 3838 are academic staffs. One hundred ten (110) respondents from different professionals or experts and 264 respondents from postgraduate students were the sample size of the study. Therefore, the study sample size was determined as follows: So, the sample size was determined using the sample size determination formula:

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

Where n = sample size

d= margin of error

N = total number of students

p= proportion of population1.03

α= level of significance

q = 1-p

Where: d = 0.05

p = 0.5

α=0.05

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

Considering the population correction factor into account the sample size for Addis Ababa University should be:

$$\frac{384}{1 + 384/12791} = 373$$

Sample size allocation (proportional allocation for postgraduate, PhD and staff)

For postgraduate $\frac{7663}{12791} * 373 = 224$

For staff $n2 = \frac{2230}{12791} * 373 = 65$

Considering the population correction factor into account the sample size for Jimma University should be: Sample size allocation (proportional allocation for postgraduate, PhD and staff)

For postgraduates $n1 = \frac{1290}{12791} * 373 = 38$

For staff $n2 = \frac{1341}{12791} * 373 = 39$

Considering the population correction factor into account the sample size for Wolkite University should be:

For postgraduate $n1 = \frac{0}{12791} * 373 = 0$

For staff $n2 = \frac{167}{12791} * 373 = 4$

There for the total sample size from individual university should be

All postgraduates 224+40=264

All staff 65+39+6=110

3.6 Data collection methods and instruments

The purpose of data collection is to obtain information to keep on record, to make decisions about important issues, to pass information on to others. Primarily, data were collected to provide information regarding a specific topic.

The researcher follows the procedures to collect data; first step was obtaining permission from selected university (JU, AAU, and WU). After receiving permission from each university, the researcher selected the sample population from the total population based on sample size, the researcher adjusted appropriate time to create awareness and provide an instruction for volunteer study staff participants and postgraduate students who were selected as sample.

Data was collected by one trained supervisors and four trained data collectors recruited from experienced people. After developing training material for supervisors and data collectors,

training was conducted on data collection for five days. Using structured questionnaire for six days data was collected from selected university (JU, AAU, and WU). . After data collection was completed semi-structured interview was employed to collect data because this process allows the researcher to gain detailed insights about the phenomenon under study.

3.6.1 Instrumentation

The self-administered questionnaire and interview as well as observation were the main research instruments used for the study.

3.6.1.1 Questionnaire

Questionnaire helps to collect a good deal of data from a large number of respondents within a short period of time. Thus, questionnaire was selected because of the freedom of respondents and helps to catch their viewpoints regarding scholarly communication. So structured questionnaire was adapted after review of relevant literature and modified to local situations from previous tools that were applied in different studies related to e-publishing and scholarly communication. The questions and statements of the questionnaire were grouped and arranged according to the particular objective that they can address. A four section instrument was used to collect data from staff and postgraduate students' in selected University (JU, AAU, WU) containing the following sections: (a) Socio demographical information (profile) of respondents (b) e-publishing and scholarly communication trends of selected University and(c) Technological support in facilitating e-publishing (e) barriers of e-publishing and scholarly communication.

3.6.1.2 Interview

Interview was conducted with librarian and ICT professional to gain in-depth data about the status of electronic publishing and scholarly communication. The research plan was to interview postgraduate students' and staff members among Jimma University, Addis Ababa University and Wolkite University. 35 were selected purposively for interviews. The aim was to gain in-depth information about the benefits of electronic publishing and scholarly communication in higher intuition that implies on teaching and learning process

3.6.1.3 Observation

Observation was more than just looking! It involves systematic, close viewing of actions, the

recording of these actions, the analysis and interpretation of what has been seen. The researcher thus did detailed observation during the study using an observation checklist.

3.7 Reliability and Validity

It was done by using data collection methods as elaborated in sections 3.6 above. It involved 40 respondents from among the 50 selected researchers in the universities under the study. The aim of the validity was to test the adequacy of research instruments and to assess the data analysis techniques so as to uncover potential problems if any for the main study. Reliability and validity tests were used as the key determinants for usefulness of the research instruments

The review of the questionnaire mainly involved rephrasing and deletion of some of the statements, re-arranging the order of the questions for proper flow of ideas as well as deletion of some of the questions that were not part of the research model in order to reduce the length of the questionnaire. Grammar and spelling were corrected

3.8. Data Quality Control

A brief orientation was given to the data collectors and site supervisors. The completeness and consistency was checked at the site by the researcher and supervisors. The missing data, outliers, completeness and consistence was checked before data analysis. The questionnaire items for this research were collected from different published journal articles. This increases the validity of the research as it was based on already empirically tested instruments.

3.9 Data Analysis

The data was gathered from Addis Ababa University, Jimma University postgraduate and Wolkite University (respondents). After data collection was completed, each questionnaire was checked for completeness, missing value and unlikely response manually checked and final data was coded using the Statistical Package for the Social Sciences (SPSS) version 20. A descriptive and inferential statistics was used for the data analysis. Tables, pie and bar charts were used, and then interpretation was done for each table or figures to answer the research questions. Important and significant comments from the open-ended questions were presented to support and elaborate appropriate findings.

3.10 Ethical consideration

The proposed study findings should benefit and cause no harm to the participants and society. Privacy and confidentiality was maintained at all times, all findings were portrayed in a confidential manner no personal or identifiable information were recorded or printed in the study. No names were recorded during the interviewing process.

The researcher respects the human right of free choice and thus ensures informed consent was completed before carrying out any interviews. The researcher ensure a regular review of what the participants have given consent to; this was referred to as a procedure of consent, which enables the researcher to renegotiate features of the consent form derived from the changing description of the inquiry. All findings and results presented are that of actual facts stated in the interviews.

Ethical issues may arise at any point during any study regardless of the rigorous planning. Therefore it was important that possible ethical issues were identified, prevented, and reviewed as best as possible prior to, during and after the study.

Chapter Four

4. 0. Results and Discussions

4.1 Results

Two groups of respondents, namely academic staff and postgraduate students , were identified from three major Ethiopian higher learning institution which are, directly or indirectly, involved in production of scholarly documents for e-publishing and scholarly communication in Ethiopia, namely, Addis Ababa university, Jimma university, Wolkite university. It is assumed that the mix of these institutions would adequately be representative of other higher education institutions in the country.

. This Chapter presents the results obtained from the survey (i.e. questionnaire, interviews and observation). The reported results are based on the study research questions' themes as listed underneath:

- What are the current trends and models of e-publishing and scholarly communication?
- What are the existing and future major challenges and opportunity to build up electronic publishing and scholarly communication?
- What are possible factors affecting e publishing and scholarly communication?
- What are the benefit of e-publishing scholarly communication on the teaching/learning, research and service activities in the universities

The presentation of the findings is guided by research questions listed above. The results of the descriptive statistics address three research questions. The inferential statistics' results are presented in the last section to address one research question.

4.1.1 Socio – demographic Characteristics of the respondents

The total number of distributed questionnaires was 374, out of which 356 were filled and returned. These numbers shows that 95 % of the questionnaires were filled and returned. The entire 356 questionnaires were filled properly and found appropriate for the analysis of this particular study.

The study also targeted 35 librarians and ICT professionals from the three public universities in Ethiopia. Among the 35 librarians and ICT professionals, 30 (85.7%) were interviewed. The interviewees were 6 library and ICT director; 24 librarians and ICT professionals in various

sections.

With respect to the respondents, the response achieved was 356, which is 95.2% of the target. The distribution of the respondents by rank and qualification for each institution is summarized in bellow

Table 4.1 Socio – demographic Characteristics of the Study Participants

			Total	
		Male	Female	
Respondent gender	AAU	252 90.3%	27 9.7%	279 100.0%
	JU	59 81.9%	13 18.1%	72 100.0%
	WU	3 60%	2 40%	5 100.0%

				Total	
		Academic staff	Postgraduate students		
Professional position	AAU	59 21.1%	220 78.9%	279 100.0%	
	JU	37 51.4%	35 48.6%	72 100.0%	
	WU	5 100.0%	0 0.0%	5 100.0%	

						Total
		Graduate assistance	Assistant lecturer	Lecturer	Assistant professor	
Academic rank	AAU	40 14.3%	194 69.5%	42 15.1%	1 1.7%	279 100.0 %
	JU	19 26.4%	30 41.7%	22 30.6%	1 1.4%	72 100.0 %
	WU	1 20.0%	0 0.0%	4 80.0%	0 0.0%	5 100.0 %

According to the data obtained as depicted in Table 4.1 above, 90.3% (252) of the respondents were from Addis Ababa university, 81.9% (59) from Jimma university, 60.0% (3) from Wolkite university are males while 9.7%(27) from Addis Ababa university,18.1%(13) from Jimma

university, 2(40.0%) from Wolkite university are females. This shows that most of the respondents from these universities are males.

With respect to respondents' professional position was broadly classified into two categories, namely, academic staff and postgraduate students. The result revealed that, majority 78.5% (220) of the respondents are postgraduate student' and 21.1 %(59) of the respondents are academic staff from Addis Ababa University. From Jimma university 51.4 %(37) respondents are postgraduate students and 48.6% (35) are academic staff. Lastly all respondents (5) are academic staff from Wolkite University and there is no postgraduate student in Wolkite University as it is established very recently (Table 4.1)

As presented in above Table 4.1, the result reveals that 15.1% (42) of the respondents are lecturers, followed by graduate assistant 14.3% (40) , Assistant lecturer 69.5% (194) and Assistant professor 1(1.7%) in Addis Ababa university. In Jimma university, 14 (40.0%) of the respondents are lecturers, followed by graduate assistant 12(34.3%), Assistant lecturer 8(22.9%) and Assistant professor 1(1.7%). As to the case of Wolkite University there are 4(80.0%) lecture and 1(20.0%) graduate assistant. The composition of the postgraduate student's was found that 194(88.2 %) of the respondents hold assistant lecturer position, followed by graduate assistant 26 (11.8%) in Addis Ababa university. In case of Jimma university 29(78.4%) of the respondents are assistant lecturers, followed by graduate assistant 8(21.6%). Based on these findings, it can be said that majority of the respondents are assistant lecturer who are studying at Addis Ababa university.

4.1.2. The current trends and practices of e-publishing and scholarly communication

Respondents were asked to indicate their practices with respect to the use of electronic resources, as well as their behavior in making their research available; how they felt about e-publishing methods of information dissemination as venues for their own research; the level of universities to motivate scholars.

Table 4.2 current practices of e-publishing and scholarly communication [N=356]

Statement	universities	Rate (frequency ,percentage, mean and SD)						
		Strongly disagree	Disagree	Undecided	agree	Strongly agree	X	SD
Selection, organization and dissemination of electronic resources	JU	57 79.1%	7 9.5%	2 2.8%	4 5.6%	2 2.8%	1.2	.9
	AAU	223 79.2%	9 3.2%	6 2.2%	10 3.6%	8 2.9%	1.3	.82
	WU	4 80.0%	1 20.0 %	0 0.05	0 0.0%	0 0.0%	1.2	.9
Employees use groupware like group mail to communicate work related information in a group	JU	49 67.9%	16 18.2 %	4 5.6%	5 6.9%	1 1.4%	1.3	.45
	AAU	230 82.4%	13 4.7%	14 5.0%	5 1.8%	17 6.1%	1.4	.84
	WU	3 60.0%	0 0.0%	2 40.0 %	0 0.0%	0 0.0%	1.4	1. 1
There is reward and compensation system for researcher's contribution of scholarly documents	JU	51 70.7%	13 18.2 %	2 2.8%	5 6.9%	1 1.4%	1.4	.5
	AAU	229 82.1%	16 5.7%	12 4.3%	11 3.9%	11 3.9%	1.4	.94
	WU	3 60.0%	1 20.0 %	0 0.0%	1 20.0 %	0 0.0%	1.4	1.0

X=mean

Key SD= standard deviation

Respondents were posed with different questions on the trends of e-publishing and scholarly communication activities to rate the questions on the base of the five liker scale. To analyze the results the researcher considered the percentage corresponding to the mean and the standard deviation of the scale for analysis respectively with respective universities. A mean score was considered strongly disagreed (SD), if it falls within the range of 1.00 - 1.80; a mean score within the range 1.80 - 2.60 was taken as Disagreed (D); a mean within the range 2.60 - 3.40 was considered undecided (UD), while a mean score within the range 3.40 - 4.20 was taken as Agreed (A); and a mean score within the range 4.20 - 5.00 was considered strongly Agreed (SA) for positive items (gojeh. 2013). As presented in table 4.2 above, majority of the respondents of JU 79.1% (57) strongly disagreed that the university selects, organizes and disseminates electronic resources. It was also revealed that a large proportion 69.9% (49) of JU strongly disagreed with the statement: "There is reward and compensation system for researchers' contribution of scholarly documents". Moreover, 70.7% (51) of respondents strongly disagree with the statement employees use groupware like group mail to communicate work related information in a group.

From AAU, majority, 82.4% (230) of the respondents strongly disagree that employee use groupware like group mail to communicate work related information in a group; similarly 82.1% (229) of the respondents strongly disagreed about the university having reward and compensation system for researchers' contribution of scholarly documents in the university. Moreover 79.2% (223) strongly disagree with the statement university actively participate on Selection, organization and dissemination of electronic resources

From WU majority 80.0% (4) of the respondents strongly disagree that the university selects, organizes and disseminates electronic resources. 60.0% (3) of the respondents strongly disagreed with regarded to reward and compensation system for the researcher's contribution of scholarly documents. Similarly, 60.0% (3) of the respondents strongly disagreed the trend of employees use groupware like group mail to communicate work related information in a group

4.1.2.1 Awareness about e-publishing and scholarly communication

Participants were asked to indicate whether their institutions had already implemented an Institutional repository,experience of using it, personal using skill and also the respondents were asked on whether or not they had heard about e-publishing before their participation in this survey and how they were informed about it.

Table 4.3 awareness about availability of Institutional repositories.

Institutional repositories	Universities	Rate and frequency			Total
		Yes	No	I do not know	
There is institutional repositories	JU	5 6.9%	61 84.7%	6 8.3%	72 100.0%
	AAU	182 65.2%	91 32.6%	6 2.2%	279 100.0%
	WU	1 20.0%	3 60.0%	1 20.0%%	5 100.0%

The respondents were asked on the availability of institutional repositories at their institution. For AAU, majority of the respondents 65.2% (182) indicated presence of institutional repositories in the institution. On the contrary, , for JU 84.7 % (61) of the respondents indicates there is no institution repository in the institution and the same holds true for WU (Table 4.3). It is the same for WU. It also represent with graph below (figure 1)

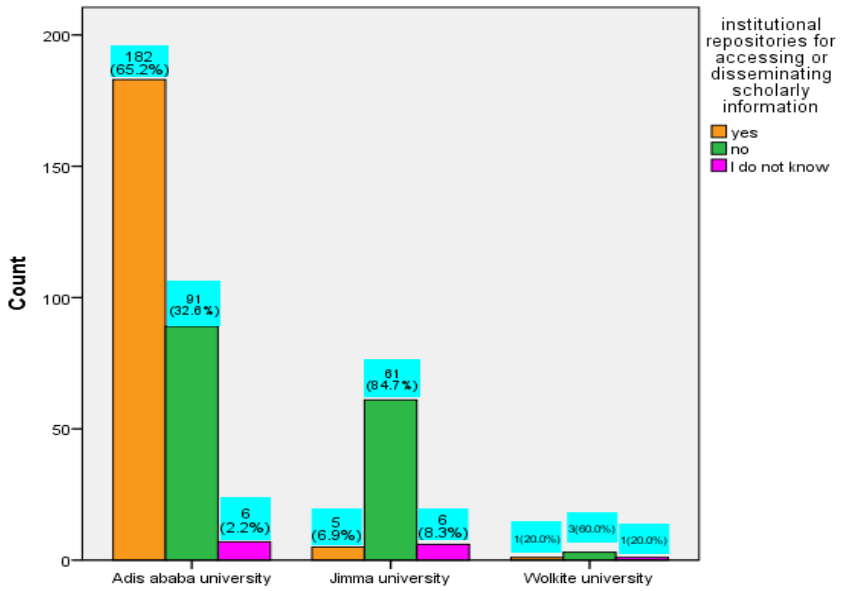

Figure 1 availability of institutional repositories

As show from figure 1, Addis Ababa University has more experience than Jimma and Wolkite Universities in using institutional repository for accessing or dissemination scholarly communication.

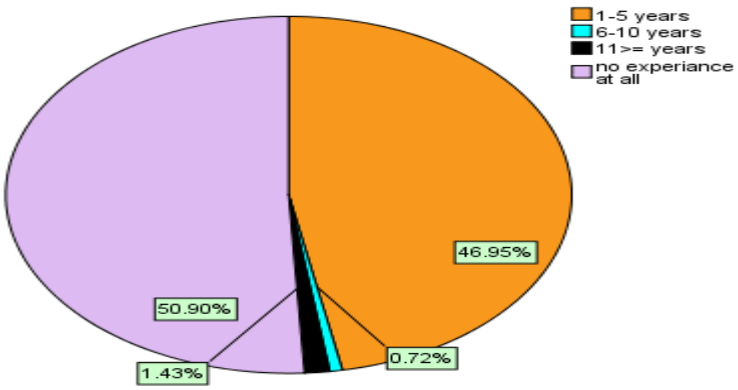

figure 2 Experience for using institutional repositories

Out of the 279 respondents, the majority, 64.04 %(179) of the respondents had experience of 1-5 years; 17.1% (48) had more than six years of experience and 9.2% (26) had eleven years experience (Figure 2). This shows that even if there is an institutional repository in the institution, the use of institutional repositories is quite limited for accessing and disseminating of scholarly documents.

4.1.2.2 Respondents institutional repositories usage skills

Prior to asking the respondents to rate themselves regarding their Internet usage skills in terms of accessing and publishing research output, they were first requested to indicate how they were trained in such aspects. Table 4.6 present the results on how the respondents learnt to develop the institutional repositories usage skill

Table 4.4: Means to Acquire Institutional Repository Usage [N=279]

Means	respondent position		Total
	Academic	Postgraduate	
Self-learning	47 79.7%	129 58.6%	176 63.1%
Training by the University ICT Center	2 3.4%	16 7.3%	18 6.4%
Training by the University library	2 3.4%	15 6.8%	17 6.1%
From friends/colleagues	47 79.7%	28 12.7%	75 26.9%
nal classes/courses	3 5.1%	14 6.4%	17 6.1%

As presented in Table 4.4, the result of this study showed that self-learning were the main means to acquire Institutional Repository (IR) usage, because the majority of the respondents 63.1 % (176) responded self-learning as a means to learn IR usage. The second top means of learning IR usage was found to be from friends/colleagues, which 26.9% (75) respondents and the remaining means are of teach IR usage shared almost equal respondents, about 6%. It was also found that some of the respondents learn institutional repository usage skill through more than one means, hence the number of respondents and percentage add to more than 356 and 100% respectively.

4.1.2.3 Awareness about electronic publishing

The respondents were asked on whether or not they had heard about e-publishing before their participation in this survey and how they were informed about it

Table 4.5: Respondent awareness about electronic publishing before this survey [N=356]

Awareness	Universities	Position	Rate and frequency		Total
			Yes	No	
Awareness about electronic publishing	Ju	Academic staff	17 45.9%	20 54.1%	37 100.0%
		Post Students	16 45.7%	19 54.3%	35 100.0%
	AAU	Academic Staff	45 76.3%	14 23.7%	59 100.0%
		Post Students	153 69.5%	67 30.5%	220 100.0%
	WU	Academic Staff	1 20.0%	4 80.0%	5 100.0%

Among the AAU, 76.3% (45) respondents of academic staff and 69.5% (153) of postgraduate students responded that they have heard about electronic publishing before this survey. Whereas, from JU less than half, 45.9% (17) and 45.7% (16) of academic staff and postgraduate students respectively, were aware of it. As to the WU respondents 80% (4) were no aware of it. From this result it can be said that, the awareness of the electronic publishing is based on the generation of the universities that means the first generation has better advantage on awareness of e-publishing.

Table 4.6: Respondents' information sources on electronic publishing [N=356]

Information Source	respondent position		Total
	Academic staff	Postgraduate	
Internet discussion about electronic publishing	13 22.0%	23 10.5%	74 20.8%
Heard about it from my colleague	34 57.5%	134 60.9%	254 71.3%
Heard about it from researcher promotion	3 5.1%	20 9.1%	39 10.9%
Heard about it from my teacher	4 6.8%	21 9.5%	37 10.3%
Heard about it from my University library	6 10.1%	23 10.5%	39 10.9%

The respondents were asked on how they know about e-publishing before their participation in this survey and how they were informed about it. Among the 279 respondents who responded to this question, majority 71.3 %(254) of the respondents heard about e-publishing from colleague/friends. Moreover, 10.9% (39) of the respondents learnt of it through researcher' promotion and 20.8 %(74) by following the Internet debate. Other means through which the respondents were informed about e-publishing included: workshops/conferences, library promotion, by chance while surfing the Internet, and some of them learnt about it during their postgraduate training abroad.

Table 4.7: The importance of publishing scholarly documents in electronic format

Publish	Universities	Publish in electronic format					X	SD
		Excellent	very good	Good	fair	Poor		
Publish in electronic format	AAU	165 59.1%	21 7.5%	45 16.1%	20 7.2%	28 10.0%	1.4	1.4
	JU	48 66.7%	11 15.3 %	7 9.7%	2 2.8%	4 5.6%	1.3	0.8
	WU	3 60.0%	2 40.0 %	0 0.0%	0 0.0%	0 0.0%	1.4	.62

Key SD=standard deviation

X= Mean tomorrow

The result obtained as presented in table 4.7 above on respondents rate the importance of publishing scholarly documents in electronic format showed that from AAU 59.1% (165) of respondents rate the idea of publishing scholarly documents in electronic format is excellent. Similarly from JU 66.7% (48) respondents rate the idea of publishing scholarly documents in electronic format is excellent and 60.0% (3) of WU respondents also rate it excellent

4.1.4.4 Internet facilities

For users to access or publish scholarly content on the Internet in particular, it is important that institutions have the necessary bandwidth Internet connectivity. The respondents in this study rated the intuitionist Internet connectivity as having very good or good connectivity to accessing and disseminate scholarly documents.

Table 4.8: Internet facilities in the institution

		internet facilities in the institution					X	SD
		Excellent	very good	good	fair	poor		
Internet facilities	AAU	12 4.3%	16 5.7%	159 57.0%	59 21.1%	33 11.8%	3.3	0.91
	JU	3 4.2%	14 19.4%	39 54.2%	4 5.6%	12 16.7%	3.1	1.0
	WU	0 0.0%	0 0.0%	0 0.0%	1 20.0%	4 80.0%	4.8	0.4

Key

X= Mean

SD=standard deviation

Prior to asking the respondents to rate institution regarding their Internet facilities in terms of accessing and disseminating or publishing research output or scholarly document. Based on the mean of individual universities, AAU 57.0% (159) of the respondent rate the institutional Internet facilities are good. While JU 54.2 %(39) of respondents also rate the institutional Internet facilities is good. However 80.0 %(4) of WU respondents indicated that Internet facilities in their institution are poor.

4.1.4. 5 Current means of Exchange of scholarly communication in the institutions

Scholarly communication in the university shows how academics communities and researchers in different fields use different channels to disseminate information related to their work. Scientific and scholarly communication uses different channels, formal and informal, direct and indirect, physical and virtual, to transmit ideas between and among partners from similar or related fields. The fundamental goal of scholarly communication is always to disseminate research studies done by members of the academic community.

Table 4.9 Methods of exchanging scholarly documents [N=356]

Means of exchanging	Universities	respondent position	
		Academic staff No. (%)	Postgraduate student No. (%)
E-mail	JU	21 (56.8%)	25 (71.4%)
	AAU	40 (67.8%)	158 (71.8%)
	WU	4 (80.0%)	0
Institutional repository	JU	5 (13.5%)	2 (5.7%)
	AAU	4 (6.8%)	21 (9.5%)
	WU	0 (0.0%)	0
Conferences Seminars/workshops	JU	5 (13.5%)	2 (5.7%)
	AAU	2 (3.4%)	11 (5.0%)
	WU	2 (20.0%)	0
posting on websites	JU	3 (8.1%)	1 (2.9%)
	AAU	2 (3.4%)	9 (4.1%)
	WU	0 (0.0%)	0

As presented in Table 4.9, when JU academic staffs were asked how they exchange scholarly documents with colleagues within the institution, most of the respondents 56.8% (21) responded using email, 13.5% (5) using Institutional repository, 13.5% (5) Conferences Seminars/workshops, 8.1% (3) posting on websites. With postgraduate students, majority 71.4% (25) of the respondents exchange using email, 5.7% (2) Institutional repository, 5.7% (2) Conferences Seminars/workshops, 2.9% (1) posting on websites

With respect to AAU academic staff majority 67.8% (40) of the respondents exchange scholarly documents by using email, 6.8% (4) using Institutional repository, 3.4% (2) using conferences seminars/workshops, 3.4% (2) by posting on websites. Concerning postgraduate students,

majority 71.8% (158) of the respondents exchange such documents by using email, 9.5% (21) Institutional repository, 5.0% (11) conferences seminars/workshops, 4.1% (9) by posting on websites

As to the WU academic staff respondents the exchange of scholarly documents with colleagues inside the institution, they responded that they mainly do so by using email, i.e., 80.0%(4), 0.0% using Institutional repository , 20.0% (4) conferences seminars/workshops, 0.0 % posting on websites.

4.1.3 Barriers and opportunities of electronic publishing and scholarly communication

E-publishing and scholarly communication in Ethiopia higher learning institution is still in its infancy. The low e-publishing and scholarly communication uptake is attributed to both personal and infrastructural factors.

4.1.3.1. Barriers of e-publishing and scholarly communication

Table 4.10: Barriers of electronic publishing and scholarly communication [N=356]

Factors/ condition as a barrier	UNIVERSITIES	Rate (frequency &percentage)					X	Y
		Strongly disagree	Disagree	Undecided	Agree	Strongly agree		
Insufficient skills to publish article in institutional repositories	AAU	19 6.8%	16 5.7%	21 7.5%	51 18.3%	172 61.6%	4.2	1.221
	JU	2 2.8%	5 6.9%	6 8.3%	8 11.1%	51 70.8%	4.4	1.083
	WU	1 20.0%	0 0.0%	0 0.0%	0 0.0%	4 80.0%	4.8	.447
Inadequate technological support	AAU	17 6.1%	18 6.5%	26 9.3%	60 21.5%	158 56.6%	4.2	1.202
	JU	4 5.6%	5 6.9%	6 8.3%	9 12.5%	48 66.7%	4.3	1.213
	WU	1 20.0%	0 0.0%	0 0.0%	1 20.0%	3 60.0%	4.80	.447
Unorganized/unclear research strategy	AAU	15 5.4%	19 6.8%	37 13.3%	56 20.1%	152 54.5%	4.3	1.194
	JU	1 1.4%	4 5.6%	9 12.5%	21 29.2%	37 51.4%	4.24	.971
	WU	1 20.0%	0 0.0%	1 20.0%	1 20.0%	2 40.0%	4.60	.894
Low personal motivation	AAU	28 10.0%	16 5.7%	32 11.5%	55 19.7%	148 53.0%	4.00	1.337
	JU	7 9.7%	7 9.7%	3 4.2%	16 22.2%	39 54.2%	4.01	1.369
	WU	2 40.0%	0 0.0%	0 0.0%	1 20.0%	2 40.0%	4.80	.447
Low Financial support	AAU	14 5.0%	15 5.4%	26 9.3%	60 21.5%	164 58.8%	4.24	1.139
	JU	4 5.6%	7 9.7%	8 11.1%	14 19.4%	39 54.2%	4.07	1.248
	WU	0 0.0%	1 20.0%	0 0.0%	1 20.0%	3 60.0%	4.60	.548
Longer peer review process	AAU	16 5.7%	16 5.7%	34 12.2%	59 21.1%	154 55.2%	4.14	1.185
	JU	6 8.3%	4 5.6%	7 9.7%	16 22.2%	39 54.2%	4.08	1.275
	WU	0 0.0%	1 20.0%	1 20.0%	1 20.0%	2 40.0%	4.60	.548

Key X= Mean Y= standard Deviation

It is revealed as presented in Table 4.10 above, that the majority 70.8% (51) of JU respondents strongly agreed with the statement regarding lack of adequate skills to publish article in institutional repositories as a contributing factor for them not to publish on e-publishing outlets. The other reasons which were highly ranked include inadequate technological support 66.7% (48), Unorganized/unclear research strategy 54.5% (37), low personal motivation 54.2% (39), low financial support 54.2% (39) and long peer review process 55.2% (40).

Similarly in AAU, majority, 61.6 %(172) of the respondents strongly agreed with the statement regarding lack of adequate skills to publish article in institutional repositories as a contributing factor for them not to publish on e-publishing outlets. The other reasons which were highly ranked include inadequate technological support 56.6% (158), unorganized/unclear research strategy 54.5 %(152), low personal motivation 53.0%(148), low financial support 58.8% (164) and long peer review process 55.2% (154).

The same result was obtained in WU, whereby 80.0 % (4) of the respondents strongly agreed with the statement regarding lack of adequate skills to publish article in institutional repositories as a contributing factor for them not to publish on e-publishing outlets. The other reasons which were highly ranked also include inadequate technological support, unorganized/unclear research strategy, low personal motivation, low financial support and long peer review process which is 60.0% (3).

4.1.3.2 Opportunities of e-publishing and scholarly communication

E-publishing and scholarly communication has brought tremendous opportunities to institutions but also complex challenges. Institutions are required to institute new policies and change some of their cultures related to scholarly communication. So it facilitates access and dissemination of scholarly content. The results from this investigation are presented in Table 4.13

Table 4.11 Opportunity to establish electronic publishing and scholarly communication

Opportunities	Universities	Rate (frequency &percentage)					X	Y
		Strongly disagree	Disagree	Undecided	Agree	Strongly agree		
Increased Universities motivation towards research	AAU	18 6.5%	23 8.2%	24 8.6%	42 15.1%	172 61.6%	4.2	1.3
	JU	4 5.6%	2 2.8%	3 4.2%	10 13.9%	53 73.6%	4.5	1.1
	WU	0 0.0%	0 0.0%	1 20.0%	0 0.0%	4 80.0%	4.	.89
Increased dynamicity of ways of communication	AAU	13 4.7%	23 8.2%	25 9.0%	57 20.4%	161 57.7%	4.2	1.2
	JU	3 4.2%	4 5.6%	6 8.3%	11 15.3%	48 66.7%	4.5	.98
	WU	0 0.0%	0 0.0%	2 40.0%	3 60.0%	2 40.0%	3.8	1.6
A shift from traditional printed format to electronic format	AAU	16 5.7%	25 9.0%	26 9.3%	47 16.8%	165 59.1%	4.2	1.2
	JU	3 4.2%	2 2.8%	4 5.6%	13 18.1%	50 69.5%	4.4	1.0
	WU	1 20.0%	0 0.0%	0 0.0%	1 20.0%	3 60.0%	4.6	.55
Favorable research strategy and policy	AAU	16 5.7%	29 10.4%	31 11.1%	42 15.1%	161 57.7%	4.1	1.3
	JU	3 4.2%	4 5.6%	4 5.6%	15 20.8%	46 63.9%	4.4	1.1
	WU	1 20.0%	0 0.0%	0 0.0%	1 20.0%	3 60.0%	4.2	.84
University Industry linkage and partnership	AAU	15 5.4%	28 10.0%	27 9.7%	46 16.5%	163 58.4%	4.	1.3
	JU	3 4.2%	2 2.8%	1 1.4%	14 19.4%	52 72.2%	4.5	1.0
	WU	1 20.0%	0 0.0%	0 0.0%	1 20.0%	3 60.0%	4.0	1.2

The result of this study showed, as presented in Table 4.11, that majority 73.6% (53) of JU respondents strongly agreed with the statement regarding increased universities motivation towards research. The other reasons which were highly ranked include increased dynamicity of ways of communication 66.7% (48), a shift from traditional printed format to electronic format 69.5% (50), favorable research strategy and policy 63.9% (46), university-industry linkage and partnership 72.2% (52). When it comes to AAU, regarding the opportunities of e-publication and scholarly communication, majority 61.6% (172) of the respondents strongly agreed with the statement regarding increased universities motivation towards research. The other reasons which were highly ranked include increased dynamicity of ways of communication 57.5% (161), a shift from traditional printed format to electronic format 59.1% (165), favorable research strategy and policy 57.7% (161), university-industry linkage and partnership 58.4% (163).

The same holds true as that of AAU and JU for WU and majority of the respondents 80.0% (4) strongly agreed with the statement regarding increased universities motivation towards research. The other reasons which were highly ranked include increased dynamicity of ways of communication, 60 %(3), a shift from traditional printed format to electronic format, favorable research strategy and policy and university-industry linkage and partnership.

4.1.4 Factors and facilities that support e-publishing and scholarly communication

4.1.4.1. Factors that support e-publishing and scholarly communication

The respondents were provided with a number of statements about influence and were asked to indicate the extent to which such factors would influence them to publish on e-publishing outlets using five point likerts' scale. The result is presented in table 4.14 below.

Table 4.12 Factors that influence personal decision to publishing and accessing scholarly content's' within institutional repositories [N=356]

Factors/ condition	Universities	Rate (frequency &percentage)						
		I do not know	Least important	Less important	Important	Very important	X	SD
Leading researchers in the institution publish article in institutional repositories outlets	JU	6 8.3%	24 33.3%	7 9.7%	10 13.9%	25 34.7%	3.3	1.5
	AAU	27 9.7%	32 11.5%	39 14.0 %	38 13.6%	143 51.3%	3.7	1.4
	WU	1 20.0%	3 60.0%	0 0.0%	0 0.0%	1 20.0%	3.0	1.6
When colleagues/friends publish article in institutional repositories outlets	JU	14 19.4%	8 11.1%	7 9.7%	12 16.7%	31 43.1%	3.5	1.6
	AAU	15 5.4%	25 9.0%	39 14.0%	40 14.3%	160 57.3%	4.0	1.3
	WU	3 60.0%	1 20.0%	0 0.0%	0 0.0%	1 20.0%	3.6	1.5
When institutional policy recommends and enforces institutional publishing to appear on institutional repositories outlets	JU	2 2.8%	6 8.3%	11 15.3 %	14 19.4%	39 54.2%	4.1	1.1
	AAU	5 1.8%	18 6.5%	25 9.0%	25 9.0%	206 73.9%	4.2	1.3
	WU	0 0.0%	1 20.0%	1 20.0 %	0 0.0%	3 60.0%	3.4	1.7
When Research funding offices require researchers to publish article in institutional repositories outlets	JU	4 5.6%	5 6.9%	4 5.6%	11 15.3%	48 66.7%	4.3	1.2
	AAU	5 1.8%	18 6.5%	36 12.9 %	32 11.5%	188 67.4%	4.4	1.1
	WU	1 20.0%	0 0.0%	0 0.0%	0 0.0%	4 80.0%	4.2	1.3

Key X= mean SD= standard deviation

It can be seen from Table 4.12 that almost all factors listed were considered by about three quarters of all the respondents as important or very important determinants for their publishing in e-publishing outlets. The factor, when Research funding offices require researchers to publish article in institutional repositories outlets was the highly ranked factor that could influence the researchers to publish institutional repositories outlets. Accordingly, 80.0%, 67.4% and 66.7% of

WU, AAU and JU University respectively, which indicates these factors as very important. According to the finding of this study, leading researchers in the institution publish article in institutional repositories outlets was the factor that is ranked lowest by 34.7%, 20.0% and 51.3% respectively for JU, WU and AAU universities.

4.1.4.2 Facilities that support electronic publishing and scholarly communication

Availability of facilitating conditions for e-publishing Table 4.13 presents the results on the availability of facilitating conditions in using e- publishing outlet s in publishing and accessing scholarly content.

Table 4.13: Availability of facilitating/supporting conditions for scholarly communication [N=356]

Facilities	Universities	Rate (frequency &percentage)					X	SD
		Strongly disagree	disagree	Undecided	Agree	Strongly agree		
The necessary knowledge to publishing scholarly contents in scholarly communication outlets	JU	5 6.9%	6 8.3%	12 16.7%	17 23.6%	32 44.4%	3.9	1.3
	AAU	20 7.2%	46 16.5%	64 22.9%	35 12.5%	114 40.9%	3.6	1.4
	WU	0 0.0%	2 40.0%	2 40.0%	0 0.0%	1 20.0%	4.0	1.4
The necessary resources to publish work in communication outlets (e.g. IT infrastructure, Internet access …)	JU	6 8.3%	14 19.4%	7 9.73%	15 20.8%	30 41.7%	3.7	1.4
	AAU	26 9.3%	49 17.6%	68 24.4%	23 8.2%	113 40.5%	3.5	1.4
	WU	1 20.0%	0 0.0%	0 0.0%	3 60.0%	1 20.0%	3.6	1.5
Guidance is available for us to use the Internet for information access	JU	6 8.3%	12 16.7%	5 6.9%	8 11.1%	41 56.9%	3.9	1.4
	AAU	2 0.7%	20 7.2%	46 16.5%	9 3.2%	202 72.4%	3.6	1.4
	WU	0 0.0%	1 20.0%	1 0.0%	1 20.0%	3 60.0%	3.2	1.3
Universities recognizes electronic publishing for my carrier development (promotion criteria)	JU	7 9.7%	6 8.3%	11 15.3%	15 20.8%	33 45.8%	3.9	1.3
	AAU	25 9.0%	37 13.3%	72 25.8%	31 11.1%	114 40.9%	3.6	1.4
	WU	2 40.0%	0 0.0%	1 20.0%	0 0.0%	2 40.0%	3.0	2.0

Key X= mean SD= standard deviation

As presented in Table 4.13, the three statement about facilities the result showed that less than half (50%) of all the respondents strongly agreed that their institutions did not provide adequate facilitating conditions for scholarly communication. The only statement whereby all three universities respondents agreed with is the statement on the presence of guidance for effective usage of the Internet in accessing information in scholarly communication. Accordingly, 60.0%, 72.4% and 56.9% of the respondents respectively for WU, AAU and JU University agreed with this statement.

4.1.5 Benefit of electronic e-publishing and scholarly communication

An assessment was made to determine how the researchers believed e-publishing and scholarly communication facilitate in access and dissemination of scholarly content. The results from this investigation are presented in Table 4.14

Table 4.14. Benefit of e-publishing and scholarly communication

Benefit	UNIVERSITIES	Rate (frequency &percentage)					X	SD
		Strongly disagree	Disagree	Undecided	Agree	Strongly agree		
Scholarly communication enable scholars to publish more quickly	AAU	17 6.1%	20 7.2%	24 8.6%	49 17.6%	169 60.6%	4.2	1.2
	JU	4 5.6%	2 2.8%	0 0.0%	13 18.1%	53 73.6%	4.6	1.0
	WU	0 0.0%	0 0.0%	0 0.0%	1 20.0%	4 80.0%	4.6	.6
E- publishing increases research impact by such works being highly used and cited	AAU	18 6.5%	17 6.1%	29 10.4%	46 16.5%	169 60.6%	4.8	1.0
	JU	0 0.0%	4 5.6%	3 4.2%	17 23.6%	48 66.7%	4.5	.8
	WU	0 0.0%	0 0.0%	0 0.0%	1 20.0%	4 80.0%	4.8	.5
It improve accessibility to scholarly literature because it is free and without access limitations	AAU	13 4.7%	16 5.7%	22 7.9%	33 11.8%	195 69.9%	4.4	1.1
	JU	3 4.2%	1 1.4%	0 0.0%	15 20.8%	53 73.6%	4.2	6.0
	WU	0 0.0%	0 0.0%	0 0.0%	1 20.0%	4 80.0%	4.4	.9
It enables researchers in Ethiopia to access literature more Easily	AAU	16 5.7%	13 4.7%	23 8.2%	37 13.3%	190 68.1%	4.6	.9
	JU	1 1.4%	3 4.2%	1 1.4%	15 20.8%	52 72.2%	4.6	.8
	WU	0 0.0%	0 0.0%	0 0.0%	1 20.0%	4 80.0%	4.6	.6

It enhances learning, teaching, research and service activities to the learning Institutions	AAU	7 2.5%	7 2.5%	12 4.3%	32 11.5%	221 79.2%	4.5	1.0
	JU	3 4.2%	0 0.0%	3 4.2%	14 19.4%	52 72.2%	4.6	.9
	WU	0 0.0%	0 0.0%	0 0.0%	2 40.0%	3 60.0%	4.6	.6

Key X= mean SD= standard deviation

The result of the study revealed that that on average, from three university, majority 63.1% (750)of the respondents strongly agreed with the statement that scholarly communication enable scholars to publish more quickly; 61.7% (74) strongly agreed with the statement that e- publishing increases research impact by such works being highly used and cited; 61.5% (73) strongly agreed with the statement scholarly communication improve accessibility to scholarly literature because it is free and without access limitations 68.7% (82) strongly agreed with the statement that e-publishing enables researchers in Ethiopia to access literature more easily and 70.4% (92) strongly agreed with the statement that e-publishing enhances learning, teaching, research and service activities to the learning Institutions.

4.1.6 The comparison the three universities

4.1.6.1 The factors which influence e-publishing and scholarly communication

Facilitating conditions and organizational influence on the one hand, and awareness, academic qualification and academic rank have been established to significantly influence at the 5% level (*p*-value = 0.005) the electronic publishing and scholarly communication behavior within respective universities. Slow Internet connectivity, inadequate skills for publishing and communication under the digital environment also influence e-publishing and scholarly communication. In this section, results from the inferential statistics are presented to isolate significant factors for electronic publishing and scholarly communication improvement in the higher learning institution.

The comparison of respondent satisfaction on current trends

Analysis on the differences in the level of awareness on current electronic publishing and on need of scholarly communications among three universities (AAU, JU, WU) respondents are carried out using one-way analysis of variance (ANOVA) and Turkey HSD Multiple comparison Test to determine among which groups the true differences lie based on the fact that the

respective variables are normally distributed. The output of ANOVA is presented in Table 4.15 below.

Table 4.15 the comparison of respondent satisfaction on current trends of e-publishing and communication

SN			N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
							Lower Bound	Upper Bound
1	University selects, organize and disseminate electronic resources based on users need	AAU	279	2.02	1.403	.084	1.85	2.18
		JU	72	1.71	1.305	.154	1.40	2.01
		WU	5	1.60	.894	.400	.49	2.71
		Total	356	1.95	1.381	.073	1.81	2.09
2	There is e-publishing outlet in the University which helps us to get electronic documents relevant to our work	AAU	279	3.86	1.469	.088	3.68	4.03
		JU	72	2.69	1.598	.188	2.32	3.07
		WU	5	2.20	1.304	.583	.58	3.82
		Total	356	3.60	1.570	.083	3.43	3.76
3	the University employees use groupware like group mail to communicate work related information in a group	AAU	279	2.1900	1.4969	.08962	2.0135	2.3664
		JU	72	2.2500	1.4117	.16637	1.9183	2.5817
		WU	5	2.2000	1.3038	.58310	.5811	3.8189
		Total	356	2.2022	1.4741	.07813	2.0486	2.3559
4	there is an incentive for e-publishing performance that is tied to successful achievement of scholarly communication	AAU	279	2.16	1.442	.086	1.99	2.33
		JU	72	2.21	1.453	.171	1.87	2.55
		WU	5	1.2	.837	.374	.76	2.84
		Total	356	2.17	1.436	.076	2.02	2.32
5	internet facilities in the institution	AAU	279	3.30	.908	.054	3.20	3.41
		JU	72	3.08	1.071	.126	2.83	3.34
		WU	5	1.60	.894	.400	.49	2.71
		Total	356	3.24	.964	.051	3.14	3.34

SN	ANOVA					
		Sum of Squares	Df	Mean Square	F	Sig.
1	Between Groups	5.783	2	2.891	1.500	.225
	Within Groups	680.585	353	1.928		
2	Between Groups	84.617	2	42.308	18.839	.000
	Within Groups	792.743	353	2.246		
3	Between Groups	.399	2	.199	.091	.913
	Within Groups	775.632	353	2.197		
4	Between Groups	.797	2	.398	.192	.825
	Within Groups	731.091	353	2.071		
5	Between Groups	16.376	2	8.188	9.211	.000
	Within Groups	313.804	353	.889		

Multiple Comparisons							
Turkey HSD							
	(I) Respondent current university	(J) Respondent current university	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
1	AAU	JU	.310	.182	.207	-.12	.74
		WU	.418	.622	.780	-1.05	1.88
	JU	AAU	-.310	.182	.207	-.74	.12
		WU	.108	.638	.984	-1.39	1.61
	WU	AAU	-.418	.622	.780	-1.88	1.05
		JU	-.108	.638	.984	-1.61	1.39
2	AAU	JU	1.162*	.198	.000	.70	1.63
		WU	1.657*	.674	.038	.07	3.24
	JU	AAU	-1.162*	.198	.000	-1.63	-.70
		WU	.494	.691	.755	-1.13	2.12
	WU	AAU	-1.657*	.674	.038	-3.24	-.07
		JU	-.494	.691	.755	-2.12	1.13
3	AAU	JU	-.06004	.19538	.949	-.5199	.3998
		WU	-.01004	.66693	1.00	-1.5797	1.5597
	JU	AAU	.06004	.1953	.949	-.3998	.5199
		WU	.05000	.68360	.997	-1.5589	1.6589
	WU	AAU	.01004	.6669	1.00	-1.5597	1.5797
		JU	-.05000	.68360	.997	-1.6589	1.5589
4	AAU	JU	-.043	.190	.972	-.49	.40
		WU	.365	.649	.840	-1.16	1.89
	JU	AAU	.043	.190	.972	-.40	.49
		WU	.408	.666	.813	-1.16	1.97
	WU	AAU	-.365	.649	.840	-1.89	1.16
		JU	-.408	.666	.813	-1.97	1.16
5	AAU	JU	.221	.125	.179	-.07	.51
		WU	1.705*	.425	.000	.70	2.71
	JU	AAU	-.221	.125	.179	-.51	.07
		WU	1.483*	.436	.002	.46	2.51
	WU	AAU	-1.705*	.425	.000	-2.71	-.70
		JU	-1.483*	.436	.002	-2.51	-.46
*. The mean difference is significant at the 0.05 level.							

Table 4.15 presents the results of the comparison of respondent satisfaction on current trends of e-publishing and scholarly communication among the universities. The result shows that on the average, the levels of mean score satisfaction on the current trends between the universities from the respondents are significantly different at the 5% level (*p*-value = 0.05). The Turkey HSD Multiple comparison Test confirms that, the mean score listed from the above table show that. On average, the level of mean score satisfaction of respondent among the universities are similar with the Statement of 1, 3 and4 which are, (2.02, 1.71, 1.60), (2.2, 2.2, 2.3), (2.16, 1.2, 2.21), respectively; all respondents are strongly disagree with the statement. However, it also shows the difference among the universities with the statement of 2 and 5 which are (3.86, 2.20, and 2.69), (3.30, 3.08, 1.60) respectively: on both statement AAU respondents are agree, the other universities are disagree. Relatively, the result shows that, the current trends of e-publishing and scholarly communication is good in AAU.

4.1.6.2 Differences in awareness on e- publishing among respondent status

Analysis on the differences in the level of awareness on current electronic publishing and on need of scholarly communications among three universities (AAU, JU, WU) respondents are carried out using one-way analysis of variance (ANOVA) and Turkey HSD Multiple comparison Test to determine among which groups the true differences lie based on the fact that the respective variables are normally distributed. The output of ANOVA is presented in Table 4.15 below.

Table 4.15 the comparison of Respondents knowledge about electronic publishing before this survey

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Adis ababa university	277	1.44	.497	.030	1.38	1.50	1	2
Jimma university	72	1.43	.499	.059	1.31	1.55	1	2
Wolkite university	5	1.20	.447	.200	.64	1.76	1	2
Total	354	1.44	.496	.026	1.38	1.49	1	2
ANOVA								

Respondents knowledge about electronic publishing before this survey					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	4.931	2	2.465	11.382	.000
Within Groups	75.806	350	.217		
Total	80.737	352			

Multiple Comparisons

The difference between universities Respondents knowledge about electronic publishing before this survey

(I) Respondent current university	(J) Respondent current university	Mean Difference (I-J)	Std. Error	Sig.
Addis Ababa university	Jimma university	-.262*	.062	.000
	Wolkite university	-.507*	.210	.002
Jimma university	Addis Ababa university	.262*	.062	.000
	Wolkite university	-.244	.215	.771
Wolkite university	Addis Ababa university	.507*	.210	.049
	Jimma university	.244	.215	.771

Table 4.15 presents ANOVA results of the comparison of universities respondent on current electronic publishing and scholarly communication awareness of respondents among universities. The result showed that on the average, the levels of mean score awareness on the current scholarly communication between the respondents from the status of respondents are statistically significantly different (*p*-value = 0.005). The Multiple comparison Test confirms that, the universities (AAU, JU, and WU) have different mean scores. On average, the level of mean score is 1.44, 1.43 and 1.20 respectively for AAU, JU and WU. The result shows that level of the respondent's awareness about the current e-publishing in respondents' status is different. From this result we can conclude that on average, respondent from AAU highly aware than JU and WU but relatively respondents of JU and WU are not aware and their level of awareness is the lowest compared with that of respondents from the two universities.

4.1.6.3 Differences in Perceived Benefit of electronic publishing and scholarly communication

Table 4.16 Differences in Perceived Benefit electronic publishing

Descriptive									
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Scholarly communication enable scholars to publish more quickly (turnaround time from submission to publishing is short	AAU	279	4.19	1.223	.073	4.05	4.34	1	5
	JU	72	4.51	1.048	.124	4.27	4.76	1	5
	WU	5	4.80	.447	.200	4.24	5.36	4	5
	Total	356	4.27	1.189	.063	4.14	4.39	1	5
Electronic publishing increases research impact by such works being highly used and cited	AAU	279	4.19	1.227	.073	4.04	4.33	1	5
	JU	72	4.51	.822	.097	4.32	4.71	2	5
	WU	5	4.80	.447	.200	4.24	5.36	4	5
	Total	356	4.26	1.156	.061	4.14	4.38	1	5
Scholarly communication improve accessibility to scholarly literature because it is free and without access limitations	AAU	279	4.21	1.181	.071	4.07	4.35	1	5
	JU	72	5.18	6.010	.708	3.77	6.59	2	55
	WU	5	4.80	.447	.200	4.24	5.36	4	5
	Total	356	4.41	2.911	.154	4.11	4.72	1	55
Electronic publishing enables researchers in Ethiopia to access literature more Easily	AAU	279	4.33	1.166	.070	4.20	4.47	1	5
	JU	72	4.58	.835	.098	4.39	4.78	1	5
	WU	5	4.80	.447	.200	4.24	5.36	4	5
	Total	356	4.39	1.104	.059	4.28	4.51	1	5
Electronic Publishing in communication outlets exposes scholarly work to a large potential	AAU	279	4.37	1.139	.068	4.23	4.50	1	5
	JU	72	4.58	.915	.108	4.37	4.80	1	5
	WU	5	4.80	.447	.200	4.24	5.36	4	5
	Total	356	4.42	1.093	.058	4.30	4.53	1	5
It enhances learning, teaching, research and service activities to the learning Institutions	AAU	279	4.62	.880	.053	4.52	4.73	1	5
	JU	72	4.56	.918	.108	4.34	4.77	1	5
	WU	5	4.60	.548	.245	3.92	5.28	4	5
	Total	356	4.61	.883	.047	4.52	4.70	1	5

…

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
1	Between Groups	5.811	2	2.906	2.09	.125
	Within Groups	490.301	353	1.389		
2	Between Groups	4.643	2	2.321	1.66	.190
	Within Groups	491.658	353	1.393		
3	Between Groups	1.458	2	.729	.603	.547
	Within Groups	425.274	352	1.208		
4	Between Groups	1.825	2	.913	.849	.429
	Within Groups	379.276	353	1.074		
5	Between Groups	2.860	2	1.430	1.30	.273

	Within Groups	386.199	352	1.097		
6	Between Groups	3.745	2	1.872	1.84	.159
	Within Groups	355.973	351	1.014		

In Table 4.16, the results of the comparison of perceived benefit of electronic publishing and scholarly communication among respondents' in their respective universities using one way ANOVA are presented. The result of the study showed that on average, the levels of mean score satisfaction on perceived benefit of electronic publishing and scholarly communication among respondents' in their respective universities is not statistically significant, i.e., the three universities status of respondents of AAU, JU and WU have almost the same mean score at the 5% level (p-value > 0.05).

4.1.7. Qualitative Results

4.1.7.1. Views of the respondents about e- publishing and scholarly communication

The summary on views of the study participants about electronic publishing and scholarly communication is as follows:

e-publishing is good, it should not be limited to universities alone but should be adopted national-wide, university administrators should be educated on e-publishing and scholarly communication benefits and limitations for its adoption at respective institutions, policies should be reviewed to consider e-publishing publications in career development, it is good for sharing research results as well as increasing researchers' and institutions' recognition internationally, it is also important but it is new, there is need for more sensitization and having it supported by university policies, and especially good for countries with limited access and dissemination of research findings. Moreover it will benefit distance learning students good initiative, promote and implement it and it depends on Internet, so connectivity should be improved for more researchers to benefit, E-publishing is good but the perceived low quality of free journals and poor Internet connectivity especially in Ethiopia remain the main challenges.

4.1.6 Interview and observation

Based on the purposive sampling methods; librarians, librarian, ICT professionals in the e-publishing and scholarly communication area were selected and interviewed for this research. The summary of the finding is narrated as follows. On how universities practice or experience in creating, generation, organization, utilization and dissemination of electronic resources that might be of value to their academic and research endeavor, most of the interviewees reported that their respective institutions did not organize, manage and disseminate electronic resources. However, AAU respondents mentioned that over the last few years their university has been involved in initiatives and projects that aim to provide better access to electronic resources.

One respondent compared the availability of electronic resources/scholarly documents in Europe and in Ethiopia as follows:

"In the university [in Europe] had many subscriptions to articles or scholarly documents". Therefore, I had chance to access to virtually any article that I needed. However, problems arose when it came to having access to locally-produced (i.e. Ethiopian) scholarly documents". Such items have not been published in electronic format, nor can you find them on the Internet or locally implemented open sources software. So, one would have to be present and request hard copies that might need translation or other modifications. This does not mean that there is a shortage of research articles. In fact, many articles have been written over the years. But the fact remains that these articles have not been published have created the impression that there is, indeed, a shortage of advanced technology. Researchers lack information literacy skills in the use of such resources. Hence, this mismatch has slowed down the use of electronic resources.

One librarian noted that there are ongoing efforts in the newly established Ethiopian university and Research Libraries Consortium to integrate efforts in order to facilitate access to e-resources. The librarian said that "As you know Ethiopian academic libraries are not strong to coordinate efforts and resources and to develop an exit services "

In general as noted from the interviewee JU and AAU, except WU currently participate in some projects, like, implementing digital library and institutional repositories to make available the electronic resources for university communities but it is not enough. However, AAU librarians reported that the usage of the electronic resources is very low. Low bandwidth, lack of awareness

by university researchers and students, and information literacy problems have been highlighted as the major causes for the low usage rate of these electronic resources.

On the Dissemination of scholarly documents**,** respondents from WU reported that none of the institution scholarly document is available online. Many agreed that libraries do not have means of disseminating of scholarly documents. One respondent, in particular, underscored the point that there exists a big gap between the knowledge community and technology in the institution. There seems to be lack of facilities, as the later cannot easily access research outputs done in the intuition. This interviewee identified the following two causes for this dilemma. First of all academic and research institutions that undertake research fail to properly produce their research findings and secondly, research coordinator does not know what research efforts have been undertaken. He says "it is like a river flowing in its course without benefiting the people who have settled around it". Moreover, this interviewee said the solution to the above two problems is to disseminate research outputs(scholarly documents) that are considered to be beneficial to others and put them on the Internet or locally implemented open sources software(intuitional repositories) . For him, ICT and library have the responsibility and the mandate to fulfill this.

Awareness about e-publishing and scholarly communication is very low among Ethiopian academicians, researchers and librarians. According to the discussions, conducted during interviews, held with ICT director, researchers and librarians of the three universities involved in this study, to date electronic publishing has not yet made any significant stride in Ethiopia higher learning institution. Relatively speaking, librarians are better informed about, electronic publishing than academia. This better awareness by the librarians is due to the day to day activity. When asked about his awareness about electronic publishing and scholarly communication, one librarian responded by saying as some of the respondents are currently conducting research while abroad, they stated that they had heard about electronic publishing and scholarly communication in their respective places of study, most of which were European universities. Even they have not yet published in communication channels. From these, it is safe to assume that, electronic publishing and scholarly communication it not yet well known in Ethiopia, even by librarians. This is especially true for respondents, who seem to have never heard anything about the subject. They make this informed guess and link it to access to e-resources. This is due to the fact that they had been informed about e-journals by librarians

As to the institutional repository, two of the three universities involved in this study have no institutional repositories and institutional policies to mandate depositing or self-archiving, namely JU and WU. Most of them, especially government organizations, do not have properly designed and well-maintained institutional repositories that access and disseminate current or past research scholarly documents'. In the course of a few years, even AAU, has implemented its IR from one interface to another. Furthermore, the present system lacks consistency as well as up-to-dated content and does not have links to many of its colleges, institutes and programs.

Most interviewees reported that their institutions do not have a well established scholarly communication system that would address the actual and potential needs of stakeholders. Except for the electronic thesis and dissertation (ETD) at AAU, all of the other institutes of Ethiopia do not put full-text versions of research outputs on their repositories. It is worth noting that IR has an easily navigable and searchable website and that the information is updated regularly. Even though the home page of AAU IR is well-designed, those of other institution , such as JU, and WU are not yet implemented , let alone being state-of-the-art.

There were cases whereby some interviewees reported that they could not possibly see what other institutions of Ethiopia have done or are currently engaged in, as there is not easily accessible database of completed or research on progress. In the course of discussions held with the interviewees, it was revealed that the root causes of the problem associated with the non-existence of a website or having a poorly designed and badly-maintained one is neither technical nor economical. Both AAU and JU have qualified ICT staffs compared to other universities which are versatile with advanced technologies. Both have cutting-edge servers and other network infrastructure. One respondent mentioned that, AAU's lack of action in transforming its scholarly communication systems has been mainly cultural. According to this interviewee, the research dissemination culture of the university is very poor. Other interviewee said that the University lacks clear research policy and strategies, has no incentive mechanism for researchers, and suffers from shortage of research funds, a deficiency in effective & efficient coordination, and an absence of keeping records of what has been done in the various research projects.

4.1.2.3 E-publishing and scholarly communication and Its Potential Benefits

When asked about the potential benefits of e-publishing and scholarly communication. Most of the interviewees reported that electronic publishing to Ethiopian research would benefit the

researchers, their institutions and the public at large. One interviewee said:

"This is what I believe. When you publish or put work available to be accessible by many people, in one way you are letting yourself out for criticism. For example, if I do a research on a legal issue and present it to a conference where the participants are water engineers, they do not have the depth know how of legal issues to criticize my work. But if I publish this research in an open online system, it is much likely that many lawyers are going to read it. Hence I would receive constructive comments on my work. This then may boost my academic reputation. So this is very useful."

In the course of the various discussions, held as part of the interviews conducted, it was found out that respondents are enthusiastic about embracing it and many of them believe that electronic publishing would allow Ethiopian researchers to participate in the scientific debates and contributions around the globe. In answering the question as to how electronic publishing and scholarly communication would benefit Ethiopia, a respondent emphatically said that:

"Well, electronic publishing and scholarly communication is a new concept; I believe it brings lot of benefits for developing countries like Ethiopia and even for the whole continent. Those materials and research results that can be accessed using password or those that are of hard copy and on the shelf have less impact since it is unreachable to most of those who need it".

In addition, one respondent boldly indicated that electronic publishing and scholarly communication could help Ethiopia in poverty reduction and economic growth.

The researcher has also made a detail observation based on an observation list. It was observed that all the universities considered for the study have Organizational website, Internet connection, internal networks or LAN, Computers / servers, but they are not efficient. Institutional repositories were not hosted by any of the university websites except the University of Addis Ababa front page that had a link to its institutional repository known as "Electronic thesis and dissertation". During the data collection period, this repository had 5000 documents mostly university official documents and research reports that were accessible. It should be noted further that this repository was not registered with any of the global e-publishing registers. The above results affirm the views obtained from the interview with library director who said "e-publishing has not yet been discussed at strategic or business meetings, e-publishing has been raised but not yet taken up and that the university intends to institute an institutional repository ".

The other observation from the institutions was that almost all universities had no proper storage and management mechanism for scholarly documents. Further analysis revealed that most of the universities did not pay much attention in promoting their research output through their websites. For example, among the three universities, only two universities i.e., AAU and JU provided links to electronic resources produced by such institutions while the rest did not even show the existence of local resources on their university front.

4.2. Discussions

4.2.1. Current trends of Universities e-publishing and scholarly communication

The finding of the present study on the current trends of electronic publishing and scholarly communication in the universities (77.1%) revealed that almost all universities did not select, organize and disseminate electronic resources based on users need and there is no reward and compensation system for researchers' contribution of scholarly documents Moreover, employees didn't use groupware like group mail to communicate work related information in a group and also there is no institutional repositories except AAU. Even though few institutional documents were collected in the AAU library, it is difficult to consider this as an institutional repository because of absence of institutional repository policy, insufficient of repository management system, absence of self archiving and metadata, budget, lack of professionals and so on, because JU, WU and AAU do not fulfill these criteria

This shows that those Ethiopian universities suffer from a serious shortage of access to scholarly documents. It indirectly shows that electronic publishing and scholarly communication in the university is poor or found to be at an infant stage. However, the university library system has taken the initiatives assuming that this repository is their duties and responsibilities. So far they have tried their best in collecting resources using D-Space software with a collection of more than 3,000 documents in it.

Getaneh (2009) stated that "Realizing the fact that there is a large bulk of research conducted and there is also massive research data collection at each university, the communities and the mushrooming industry in Ethiopia are not beneficiaries of these data in pushing forward the development of this country"

The above statement indicates that it is a common understanding that each universities lacks

proper channels to disseminate its scholarly documents which is produces within the university

Gemeda. (1996), for instance, reported that Ethiopia universities research is not development-oriented. He argued by saying "It is obvious that our researchers should have their research projects geared towards the solution of the socio-economic problems prevailing in our country. However, we find that there are very few channels linking research to communicate. The technological or industrial base to absorb and apply graduate research results is weak".
It indicate that universities had recognized the need for transforming its research system that encompasses, focusing on reward and compensation system for the researcher contribution of scholarly documents and an incentive for e-publishing performance that is tied to successful achievement of scholarly communication from fund solicitation and resources allocation to the actual supervision of researches and the dissemination of results

Overall, the finding of this study made clear that universities in Ethiopia beset with a very poor electronic publishing and scholarly communication culture, an absence of organization and means if disseminating electronic resources mechanisms, clear research policy and strategies, non-existence of an incentive mechanism for researchers, lack of research funds, and poor coordination. Due to this reason scholarly documents were not properly supporting the teaching, learning and research activities in Ethiopian universities.

4.2.2 Awareness of the concept of electronic publishing and scholarly communication

The respondents were asked whether or not they had heard about electronic publishing before their participation in this survey. Majority of both the academic staff (90.5%) and post graduate students (72.1%) respondents were aware of e-publishing before this survey from AAU, whereas majority of the remaining universities (i.e. JU, WU) were not aware. The next question asked was that, if so how they had become informed about it. Among the 279 respondents who responded to this question, the majority (69.9%) had heard about electronic publishing from AAU while 55.6% and 80% from JU and WU respectively had not. However, of the total respondents, 71.3% learnt of electronic publishing from their colleagues, 10.9% learnt of it through publishers' promotion and 20.8% learnt of it by following the Internet debate, while the remaining 10.9% learnt of electronic publishing heard about it from their respective University

library and/or through library promotion. Several other studies acknowledge university/library websites, contact from institutional repository staff members, publicity through campus newspapers, results of a Web search engine/Internet, direct publicity from publishers, word of mouth from associates and participation in an initial meetings of institutional repositories as ways through which respondents are exposed to electronic publishing (Molina, 2009). These results imply that advocates of electronic publishing can use a combination of methods in promoting this mode of scholarly communication to the community. It is thus necessary for librarians in collaboration with other stakeholders within the higher learning institution in Ethiopia to spearhead campaigns aiming at creating further awareness of electronic publishing by the researchers and scholars using a combination of channels.

Compared to several previous studies done in Tanzania and elsewhere, the findings of this study revealed an improvement in electronic publishing awareness over time. For example, studies done prior to 2007 indicated less than 60% of the respondents being aware of electronic publishing (Ouya, 2006). This compares to recent studies that were conducted in the Southern African region by Fullard (2007) which reported the awareness of electronic publishing among the respondents to be 61% and 71% for the former and the latter studies respectively. It appears that policy makers, i.e. the interviewees are more familiar with electronic publishing journals as 190 compared to other electronic publishing aspects or initiatives. This implies lack of deeper understanding of electronic publishing on the part of these respondents and hence the need for more awareness creation so that the concept is well understood. Colleagues, publishers' promotion and general reading Internet usage were found to be the main means through which the respondents were informed about electronic publishing. These findings suggest that despite their potential (Wang and Su, 2006; SARUA, 2008), university libraries did not play a significant role in promotion of electronic publishing in the universities involved in this study.

4.2.3 Barriers of electronic publishing and scholarly communication

The finding of the study revealed that the barriers of electronic publishing and scholarly communication in three universities include, insufficient skills to publish article in institutional repositories, inadequate technological support, unorganized/unclear research strategy, low personal motivation, low Financial support, longer peer review process and limited e- publishing

platform.

The severe barrier of e-publishing and scholarly communication was found to be insufficient skills to publish article in institutional repositories. As mentioned by the interviewees as well as the survey respondents, there is no enough skills on institutional repository, how the staff, the students and authors can submit the documents and archive their documents to the central database. Similarly, a study by Mahayana (2003) revealed that researchers and librarians believed that the existing facilities and resources were not being used optimally because many academicians and postgraduate students had inadequate skills. Kiondo (2004) also argued that lack of skills mitigated effective usage of information resources at the University of Dar es Salaam, Tanzania.

The other barriers of e-publishing and scholarly communication in Ethiopian Universities were found to be inadequate technological support. Electronic publishing and scholarly communication is based on technologies. The limited availability of the technological requirements in many higher learning institutes therefore contributes to the slow adoption of electronic publishing in such institution unless scholars have access to such technologies; they will be restricted from both access to and dissemination of their research results through electronic publishing avenues. Technological requirements such as ICTs infrastructure (computers and open sources software, Internet) as well as technical know-how (such as computer literacy and knowledge of how to use that technology), are among the barrier of e-publishing scholarly.

Ahmed (2007) pointed out that "weak communication and technological infrastructure not only block information flows in most institution, but also reflected on teaching and learning process in terms of scholarly communication. Another study by Guedon (2006) emphasized that without adequate Internet bandwidth and digitization "Africa could not even hope to gain access to the scientific literature of the world at some in the not too distant future".

Hirwade (2005) considered lack of technology infrastructural facilities and connectivity of high bandwidth as among the inhibitors of e-publishing uptake in India. Furthermore, Christian (2008)

observed that low Internet bandwidth as among the main hindrances to the widespread uptake of institutional repositories in the sub-Saharan African region. Based on one respondent suggestion about the possible solutions to the barrier of e-publishing and scholarly communication would be increase adequate infrastructure and advanced technology, sufficient human skills create research promotion means and produce clear/appropriate strategy and policy for the institutions. Therefore, the potential benefits of e-publishing can be realized only when the existing technological infrastructure is adequate and users are able to utilize it effectively. Thus, it can be said that the result of this study is in line with many research findings in India and other African countries.

4.2.5 Factors that Support e-publishing and scholarly communication

According to the finding of this study, there were different factors that support electronic publishing and scholarly communication to be more effective through influence individual scholar's decision to publish in institutional repositories in the institution. Accordingly, the most important factors that influence individual scholar's decision to publish in institutional repositories in the institution includes availability of necessary knowledge to publish individual work in scholarly communication outlets, the necessary resources to publish individual scholar output in communication outlets (e.g. IT infrastructure, Internet access …) , Guidance to use the Internet effectively for information access, institutional recognizes electronic publishing for carrier development (promotion criteria).

Based on the finding from Table 4.13, interview and observation in each institution, With respect to availability of facilities, while slightly above 50% of the respondents acknowledged adequacy of guidance for effective usage of the Internet to access scholarly documents, the overall results imply that most of the facilitating conditions for scholars to publish in institutional repositories were non-existent. For example, only 41.1% of the respondents strongly agreed on having the necessary knowledge to publish in e-publishing outlets, and majority, 58.9% of the respondents either disagreed or they were not sure of having such knowledge.

The study by Deoghuria and Roy (2007) also revealed that 45% of scientists claimed that they had knowledge in publishing in e–publishing outlets which is in line with this study. In the study by Deoghuria and Roy (2007), 10% said they would need specific assistance (from a computer or

library personnel) in order to publish their works in such outlets. Similarly, academic staff and postgraduate students on Ethiopian universities need assistance as even the idea of e-publishing and scholarly communication is new in the country.

The findings revealing that most scholars' s were uncomfortable to publish on the institutional repositories as noted above imply the need for support to enable such scholars' s to publish within locally implemented open sources software . Without provision of this support, chances for academic staff and postgraduate students in Ethiopia to disseminate their findings through e-publishing could be minimal. Therefore, the finding of this study suggested that less publishing in e-publishing outlets by scholars was partly contributed by lack of facilitating conditions as well as necessary knowledge of the respondents. The limited availability of facilitating conditions in terms of both infrastructure as well as technical know-how have also been cited as among the reasons for low uptake of e-publishing and scholarly technology

A study by Deoghuria and Roy (2007) revealed that out of 125 scientists, 64% and 20% considered funding agencies and employers respectively do influence scholars in publishing in electronic publishing outlets. Peers' influence was negated by majority of the respondents as a motivation for their publishing in electronic publishing outlets in studies reported by Deoghuria and Roy (2007) as well as Hess *et al* (2007). However, the referred two studies also revealed that publishing in electronic publishing outlets by leading scientists' in the respondents' disciplines or other disciplines could influence the scholars in the referred study to also consider disseminating their research output in similar outlets. This gives a support to the importance of the social influence factor. The above observations suggest that putting in place policies that enforce recognition of electronic publishing in tenure awards to their employees as well as funding researchers' publications costs in electronic publishing outlets should be considered as among the measures.

3.4.1 The opportunities to establish e-publishing and scholarly communication

Based on the finding of this study, there are different opportunities to build up e-publishing and scholarly communication in Ethiopian universities for future among them include, increased universities motivation towards research, increased dynamicity of ways of communication, A

shift from traditional printed format to electronic format, favorable research strategy and policy, university-industry linkage and partnership.

Similarly study pointed out by Lor (2007) stated that e-publishing presents opportunities for developing countries to access and disseminate scientific knowledge between North-South spheres of the globe.

4.2.7 Benefits of e-publishing and scholarly communication

The finding of this study showed that there were different benefits of e-publishing and scholarly communication for academic communities. E-publishing enables researchers in higher learning institution to access research produced elsewhere and disseminate and share their research findings, it improve the accessibility of scholarly literature, it enhance teaching and learning processes.

Based on the finding from Table 4.14, interview and observation in each institution, With respect to benefit of e-publishing and scholarly communication, slightly above 50% of the respondents acknowledged all item indicates the benefit of electronic publishing, and the overall results imply that academic communities were beneficial from it. For example, majority, 71.4% of the respondents strongly agreed that Scholarly communication enable scholars to publish more quickly (turnaround time from submission to publishing is short) , 69.1% electronic publishing increases research impact by such works being highly used and cited, 74.1% Scholarly communication improve accessibility to scholarly literature because it is free , 70.5% it enhances learning, teaching, research and service activities to the learning Institutions.

According to Chan and Costa (2005) the benefits of e-publishing to developing countries will include: improved access to institutional research output; improved citation and research impact; and cost effectiveness in information dissemination on the part of the institutions

In the current system of scholarly communication, developing countries may be considered to have low research impact due to limited visibility of research output from such countries. Despite the promising potential of e-publishing to improve scholarly communication in developing countries, the new form of scholarly communication is little exploited in such countries when compared to developed countries (Moller, 2006)

From this result researcher can recommend possible Combination of universities Units for Support of e-publishing and scholarly communication process that as more universities in foreign countries have adopted. This combination in Ethiopia higher learning institution should have also begin use to reposition themselves as change agents, for cooperative instructional support with information center/library, academic skills or tutorial centers, and institutional research center.

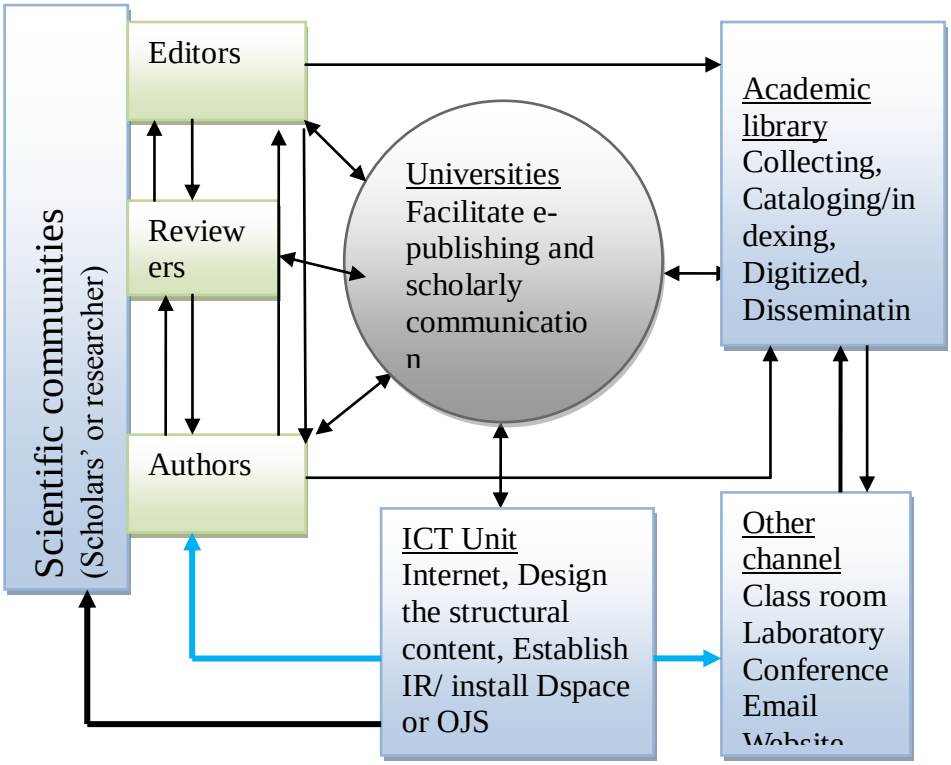

Fig 4: Proposed e-publishing and scholarly communication framework

Based on the views expressed by various participants at the observation as well as information they provided in the questionnaires, the researcher developed a chart (see Figure 4) that demonstrates the kind of collaborative partnership and coherent-working structure that must exist among these stakeholders to stimulate a strong e-publishing and scholarly communication environment. This somewhat arbitrary division is made to reflect each group's (e.g. libraries, ICT services, editors and colleges etc.) major area of interest as were demonstrated in the survey and how a combination of their functions, assets and skills can enable a more efficient and dynamic online content creation and dissemination.

Chapter five

5.0 Conclusion and recommendations

5.2 Conclusion

The goal of this study was focused on to investigate the status of e-publishing and scholarly communication among academic communities. The researcher tried to address the existing trends, challenges, and factors that facilitates/barriers for e-publishing and scholarly communication. According to the research analysis, there are low trends of e-publishing and scholarly communication. Despite its status there are also challenges that hinder the e-publishing and scholarly communication like insufficient skill and infrastructure such as, lack awareness, inadequate technological support, limited e publishing platform, and unorganized/unclear research strategy, low personal motivation, and low financial support. On the other hand some respondents suggested that the most appropriate things in order to do improve e-publishing and scholarly communication in the university are like faster Internet connectivity, availability of adequate infrastructure, sufficient human skill who works on the area, training of the researchers, librarian, or academic communities in general about scholarly communication and mechanism to submit from their own desk to the central repository , produce clear /appropriate strategy and policy for the institution and so on.

It also conclude that most scholars' s in the institution were uncomfortable to publish their our work as noted above imply the need for support to enable such scholars' s to publish within locally implemented open sources software . Without provision of this support, chances for those respondents to disseminate their findings through e-publishing outlet could be minimal. Therefore, these results suggest that less publishing in e-publishing outlets by scholars in this study was partly contributed by lack of facilitating conditions as well as necessary knowledge (i.e the poor ICT infrastructure and inadequate ICT skill) of the respondents as noted from the finding. The limited availability of facilitating conditions in terms of both infrastructure as well as technical know-how have also been cited as among the reasons for low uptake of e-publishing and scholarly communication.

In general, in Ethiopia higher learning institution, the development of e-publishing and scholarly communication is almost none. Consequently, Ethiopian higher learning institution scholarly documents remain invisible and their research results are locked in obscure library and office shelves. Scholars do not get citation impact which directly affects their reputation, promotion and other benefits that they would have got had they been visible. The current scholarly communication system is faced with technological and social challenges and it offers an opportunity to the universities to transform the current moribund scholarly communication system in the country. To increase visibility hence bring the required impact, facilities need to be set-up. The repositories need to be populated with selected, peer-reviewed academically valuable content. Infrastructural problems such as computing and bandwidth needs should be addressed. Realizing this in the very near future is in fact easier said than done. It demands concerted effort of IT people, researchers, and librarian

5.3 Recommendation

Based on the conclusions drawn from the study findings, the researcher advanced a number of recommendations. The following are some of the measures recommended to enhance the E-publishing and scholarly communication so as to improve the dissemination of scholarly documents from the universities in Ethiopia and other research institutions:

- The universities in the study to improve their Internet speed through subscription to more bandwidth so as to meet the demand from the scholarly community at the respective institutions.
- E-publishing outlets should be established using standard software and platforms fulfilling minimum and acceptable requirements so that they are harvested scholarly documents which are located elsewhere in the country. The choice of the appropriate software should however depend on the specific and additional requirement of individual institutions.

- Librarians and other information professionals should be used as change agents at Institutional level. This group of professionals should lobby with the university administrators on the establishment of scholarly communication as supported by majority of the respondents in this study. Among other mechanisms, the following means may be employed:
    - ✓ Organizing workshops and seminars specifically designed for creating awareness and deeper understanding of e-publishing and scholarly communication;
    - ✓ including specific training sessions to researchers for demonstration of access and publishing in e-publishing outlets;
    - ✓ linking electronic information sources to library websites for users to access and; Preparing and dissemination of e-publishing promotion materials as well as advising authors on possible e-publishing outlets for the dissemination of their scholarly output

References

Adams, J, King, C and Hook, D. (2010). Global research report: Africa. Available: http://www.researchanalytics.thomsonreuters.com/m/pdf/globalresearchreportsafrica.pdf (Accessed 7 May 2014).

Ahmed, A. (2007). Open access towards bridging the digital divide – policies and strategies for developing countries, Information Technology for Development, 13 (4), 337- 361.

Alemu, G. A. (2009). The role of open access in fostering knowledge sharing and collaboration in Ethiopia: a case study.

Andersen, J. (2002). The role of subject literature in scholarly communication: an interpretation based on social epistemology. Journal of Documentation 58(4): 463-481.

Arunachalam, S. (2003). Information for research in developing countries information technology, a friend or foe? International Information & Library Review, 35(2), 133-147.

American Chemical Society. (1997). "Journal of the American Chemical Society: Policy statement." from: American Chemical Society Home Page. Available from: http://pubs.acs.org/journals/jacsat/policy.html.

American Psychological Association. (1997). Publications and Communications Board of the "Web Posting Policy: American Psychological Association". Available from: APA. 1997. Publications and Communications Board of the APA Web Posting Policy: American Psychological Association.

Bachrach, S., e.tal (1998). Who should own scientific papers? Science 281 (5382):1459-1460. bloom, F. E. (1998). The rightness of copyright. Science 281 (5382):1451.

Bailey, CW. 2007. What is open access? Available: http://www.digitalscholarship. com/cwb/whatIsOA.html (Accessed May 7, 2014).

Brent, D. (1995). Stevan Harnad's 'subversive proposal': Kick-starting electronic scholarship The Information Society. 11(4)(Oct-Dec): 275-283.

Cameron, R. D. (1997). A universal citation database as a catalyst for reform in scholarly communication. First Monday 2 (4). Available from: http://www.firstmonday.dk/issues/issue2_4/cameron/index.html

Canessa, E., Fonda, C., Zennaro, M. and Sreenivasan, K.R. (2006). Access to scholarly literature via a free knowledge management enabler: an opportunity for scientists in

Chisenga, J. 1999. Global information infrastructure and the question of African content. Available: http://www.ifla.org/IV/ifla65/papers/118-116e.htm (Accessed 26 may 2014).

Covi, L. M. & Kling, R. (1998). "Shift or drift? The transitions from paper to digital libraries." In Wolf, M. T., Ensor, P. , Thomas, M. A. (Eds.), Information Imagineering: Meeting at the In terface (pp. 109-117). Chicago, IL: American Library Association.

Crawford, S. Y., Hurd, J. M. & Walker, A. C. (1996). From Print to Electronic: The Transformation of Scientific Communication. Medford, N.J.: Information Today, Inc.

De Beer, J. A. (2005). Open access scholarly communication in South Africa: current status, significance, and the role for National Information Policy in the National System of Innovation. Master thesis, Department of Information Science, Stellenbosch University, South Africa. Retrieved from http://eprints.rclis.org/archive/00003922/01/DeBeerJenniferMThesisFinalpdfimproved.pdf (accessed January 4, 2014).

Deoghuria, S & Roy, S. (2007). Open access: what scientists think? A survey of researcher's attitude towards open access. ICSD- 2007. Available: http://drtc.isibang.ac.in/bitstream/1849/314/1/081_P32_swapan_deoghuria_formatted.pdf (accessed January 4, 2014).

Dulle, FW.(2001). Researchers' perspectives on agricultural libraries as information sources in Tanzania. Library review, 50(4): 187-192.

Durrant, S. (2004). Overview of Initiatives in the Developing World. Available: http://drwin.nap.edu./books/03090091454/html/122.html (accessed January 4, 2014).

Fisher, J. (1996). Traditional publishers and electronic journals. In R. Peek & G. Newby (Eds.), Scholarly Publishing: The Electronic Frontier (pp. 231-242). Cambridge, MA: MIT Press.

Fullard, A. (2007). South African response to open access publishing: a survey of the research community. South African journal of library & information science, 73(1). Available: http://eprints.rclis.org/archive/0001o749/01/SAJLIS_73 (1)04.pdf (Accessed May 24, 2014).

Gemeda, D. (1996). Experiences of Addis Ababa University in national graduate training and research. In Erik W. Thulstrup & Hand D. Thulstrup(Ed), Research training for development proceedings of a conference on research training for countries with limited research capacity p.229-244. : Roskilde: Roskilde University Press.

Glassick, C. E. (1997), Abstract of a Paper given by Charles E. Glassick Interim President The Carnegie Foundation for the Advancement of Teaching [On-line} Available:www.unl.edu/peerrev/project_description/glassick.html).

Garvey, W. D., ed. (1979). Communication: The Essence of Science. New York: Pergamon Press.

Geoffrey M.(1999). Scholarly Communication andthe Continuum of Electronic Publishing 22, v5.7

Glover, S. W., Webb, A. & Gleghorn, C. (2006). Open access publishing in the biomedical sciences: could funding agencies accelerate the inevitable changes? Health access: key strategic, technical, and economic aspects (p. 27-38). Oxford: Chandos

Guedon, J. C. (2006). Open access: a symptom and a promise. In N. Jacobs (Ed.), Open Information and Libraries Journal, 23(3), 197–202.

Guedon, J.C. (1996). Electronic academic journals: From disciplines to "seminars." In T. Harrison and T. Stephen (Eds.), Computer networking and scholarly communication in the twenty-_rst-century university (pp. 335-350). Albany, NY: SUNY Press.

Ginsparg, P. (1996). Winners and Losers in the Global Research Village. Paper presented at the Joint ICSU Press/UNESCO Expert Conference on Electronic Publishing in Science. Available from: http://www.library.uiuc.edu/icsu/ginsparg.htm.

Hafner, K. (1998). “Physics on the Web is putting science journals on the line” (April 21) NY Times

Harnad, S. (1991). Post-Gutenberg galaxy: the fourth revolution in the means of production of knowledge. Public-Access Computer Systems Review, 2(1), 39-53.

Harnad, S. (1995). The post Gutenberg galaxy: How to get there from here. The Information Society 11(4) (Oct-Dec): 285-291.

Harnad, S. (2007). Challenge to "OA" publishers who oppose OA self-archiving mandates.

Harter, S. P. (1998). Scholarly communication and electronic journals: An Impact Study. Journal

of the American Society for Information Science 49 (6):507-516.

Harnad, S. (2006). Opening access by overcoming Zeno's paralysis. In N. Jacobs (Ed.), Open access: key strategic, technical, and economic aspects (p.73-85).Oxford: Chandos Publishing.

Harter, S. P. & Kim, H. J. (1996). Electronic journals and scholarly communication: a citation and reference study. Proceedings of the ASIS Midyear Meeting May, 1996, San Diego, CA.

Hare, H. (2007). ICT in education in Ethiopia. World Bank/infoDev. Retrieved from www.infodev.org/en/Publication.402.html (accessed 12 March 2009).

Licensing Digital Informatio. Retrieved from http://www.library.yale.edu/~llicense/ListArchives/0703/msg00025.html.

Hernandez, JMC & Mazzon, JA. 2007. Adoption of internet banking: proposition and implementation of an integrated methodology approach. International journal of marketing, 25 (2): 72-88.

Herselman, ME & Hay, HR. (2003). Challenges posed by information and communication technologies (ICT) for South African higher education institutions. Available: http://proceedings.information.informingscience.org/is2003proceedings/docs/119Herse.pdf (Accessed 15 June 2007).

Hirwade, M & Rajyalakshmi, D. (2006). Open access: India is moving towards third world super power. Available: http://eprints.rclis.org/archive/00006798/01/99107D29.pdf (A ccessed 14 October 2013).

Iacono, S. & Kling, R. (1996). Computerization movements and tales of technological utopianism. In R. Kling (Ed.), Computerization and Controversy: Value Conflicts and Social Choices (2nd ed., pp. 85-105). San Diego: Academic Press.

Jones, R. , Andrew, T. and MacColl, J. (2006). The institutional repository. Chandos Publishing: Oxford.

Kawooya, D.(2006). Copyright and access to e-resources in Africa's education and research contexts: the case of selected Ugandan Institutions. Available: http://www.policy.hu/kawooya/documents/kawooya_IPF_study2006Final.pdf (Accessed 19 march 2014).

Kiondo, E. (2004). An assessment of IT investments, electronic resource usage and information

literacy skills, in the 6th standing conference of African National and university Libraries (SCANUL-ECS), 2nd-3rd July 2004, Kampala, Uganda. P. 37-47.

Kling, R. (1999). "What is social informatics and why does it matter?" D-Lib Magazine 5(1)(January) http://www.dlib.org/dlib/january99/kling/01kling.html

Kling, R. & Covi, L. (1995). "Electronic journals and legitimate media in the systems of scholarly communication." The Information Society. 11(4):261-271.

Kling, R. & Lamb, R. (1996). "Analyzing visions of electronic publishing and digital libraries" in Scholarly Publishing: The Electronic Frontier. Gregory B. Newby and Robin M. Peek (Eds.) Cambridge Ma: The MIT Press. (1996).

Kling, R., and McKim, G. W. (1997). "Electronic media and scientific communication: Opportunities, complexities, and limitations." Report to the OECD (Organization for Economic Cooperation & Development). Working paper, version 2.1a, September 1st, Center for Social Informatics, School of Library & Information Science, Indiana University, Bloomington.

Kling, R., and McKim, G. W. (1998). "The shaping of electronic media in supporting scientific communication: the contribution of social informatics." In Charles Meadows (ed). The Impact of Electronic Publishing on the Academic Community. Chapman and Hall.

Kling, R. & Iacono, S. (1995). Computerization movements and the mobilization of support for computerization. In S. L. Star (Ed.), Ecologies of Knowledge: Work and Politics in Science and Technology (pp. 119-153). Albany: State University of New York Press.

Koehler, W. (1999). "An analysis of Web page and Web site constancy and permanence." Journal of the American Society for Information Science. 50(2): 162-180.

MIS Quarterly Web Site. (1998). Available from: http://www.misq.org.

L. A. Gojeh et al (2013)., American International Journal of Research in Humanities, Arts and Social Sciences, 3(1), June-August, 2013, pp. 08-16

Lor, PJ & Britz, J. (2004). Knowledge production, international information flows and intellectual property: an African perspective. . Available: http://www.aau.org/datad/reports/2004workshop/index.html (Accessed 2 November 2014).

Ludwick, R., Glazer, G. (2000): Electronic Publishing: The Movement From Print To Digi tal Publication Online Journal of Issues in Nursing. Vol. 5, No. 1

MacColl G. (2002). The case for open access publishing, with special reference to open access journals and their prospects in South Africa. Retrieved from http://eprints.rclis.org/archive/00005815/01/MollerThesis.pdf (accessed, march 8, 2014).

Murray, P. (1999). Current and future models for nursing e-journals: making the most of the web's potential. International Journal of Medical Informatics (53), 151-161.

Mutula, SM. 2009. Challenges of Postgraduate research: global context, African perspectives. Key Note Address Delivered at the University of Zululand, 10th DLIS annual Conference, from 9 - 10 September 2009. Available: http://lis.uzulu.ac.za/2009/mutula-uz2009DLISpaper.pdf (Accessed march 11, 2014).

New York Times. (1997). "University establishes policy to post work on the Internet." July 28, 1 997. A9. V146. P. 9.

Ntiamoah (2008). Enhancing the quality and impact of research output in African universities. Keynote address, 2nd WARIMA annual conference and workshop at the University of Ibadan, 10-12 November 2008, Ibadan, Nigeria. Available: http://www.warima.org/documents/2008annualconferencekeynoteaddress.doc (Accessed 24 February 2014).

Nwagwu, WE & Ahmed, A. 2009. Building open access in Africa. International journal of technology management, 45 (1/2): 82-101. Available: http://www.interscience.com/www/pdf/ijtmv45n12_oainafrica.pdf (Accessed 19 February 2014).

Odlyzko, A. M. (1996). Tragic loss or good riddance? The impending demise of traditional scholarly journals. In R. Peek & G. Newby (Eds.), Scholarly Publishing: The Electronic Frontier (pp. 91-102). Cambridge, MA: MIT Press.

Okerson, A.S. & O'Donnell, J. (Eds.) (1995). Scholarly journals at the crossroads: A subversive proposal for electronic publishing. Washington: Association of Research Libraries Okemwa, EO. 2004., 25 (8/9): 361-375.

Ouya, D. (2006). Open access survey of Africa-published journal. INASP infobrief, 7: June 2006. Also available: http://www.inasp.info/pubs/infobrief7-OA-web.pdf (Accessed 26 October 2013).

Ondari-Okemwa, E. (2007). Scholarly publishing in sub-Saharan Africa in the twenty-first century: challenges and opportunities., 11-13 July, 2007, available

http://ahero.uwc.ac.za/index.php?module=cshe&action=downloadfile&fileid (Accessed 26 October 2013).

Pan, CS, Sivo, S & Brophy, J. (2003). Students' attitude in a web-enhanced hybrid course: a structural equation modeling inquiry. Journal of education media & library, 41 (2): 181-194.

Pappalardo, K. (2008). Understanding open access in the academic environment: A guide for authors. Open access to Knowledge (OAK) Law Project, Retrieved from http://www.oaklaw.qut.edu.au (accessed 5 October 2008).

Park, J.H and Qin, J. (2007). Exploring the wouldingness of scholars to accept open access: a grounded theory approach. Journal of Scholarly Publishing, 38(2), 55-84.

Pickton, M. J. & Barwick, J. (2006), "A Librarian's guide to institutional repositories, Retrieved from https://dspace.lboro.ac.uk/dspace-jspui/handle/2134/1122 (accessed 18 March 2014).

Pickton, MJ. (2005). Research students and the Loughborough institutional repository. Masters Dissertation, University of Loughborough. Available: http://dspace.lboro.ac.uk/dspace/bit stream/2134/571/1/Miggie_dissertation.pdf (Accessed15 July 2006).

Radom, R., Feltner-Reichert, M., & Stringer-Stanback, K. (2012). SPEC Kit 332: Organization of scholarly communication services. Washington, D.C.: Association of Research Libraries.

Reason, P. (2003). Pragmatist philosophy and action research: readings and conversation with Richard Rorty. Action Research, 1 (1): 103-123.

Rockman, I. F. (2005). Distinct and expanded roles for reference librarians. Reference Services Review, 33(3), 257-258.

Riordan, M. (1987). The hunting of the quark: A true story of modern physics. Touchstone.

Task Force on Archiving of Digital Information. (1996). "Preserving digital information." Commissioned by the Commission on Preservation and Access and the Research Libraries Group.

Sahu, D. K. & Parmar, R. C. (2006). Open access in India. In N. Jacobs (Ed.), Open access: key strategic, technical, and economic aspects (p.175-182).Oxford: Chandos Publishing.

Salo, D. (2008). Innkeeper at the roach motel. Library Trends, 57(2). Retrieved from http://minds.wisconsin.edu/handle/1793/22088 (accessed January 3, 2014).102

Sanchez N (2009). The open access movement and Cuban health research work: an author survey. Health information and libraries journal, 27 (1): 66-74. Available: http://www3.interscience.wiley.com/cgi-bin/fulltext/122647800/PDFSTART (Accessed 2 march 2014).

SPARC. (n.d.). Coalition of Open Access Policy Institutions (COAPI). Retrieved Friday, Janu ary 03, 2014, from http://www.sparc.arl.org/ about/COAP

Srivastava, P., & Hopwood, N. (2009). A practical iterative framework for qualitative data analysis. International Journal of Qualitative Methods , 8(1), 76-84. Retrieved from http://ejournals.library.ualberta.ca/index.php/IJQM/article/viewFile/1169/5199

Stichweh, R. (2003). The multiple publics of science: inclusion and popularization. Retrieved from http://www.uni-bielefeld.de/soz/iw/pdf/stw_science_popular.pdf (Jan. 3, 14).

Suber, P. (2007). What you can do to promote open access. Retrieved from http://www.earlham.edu/~peters/fos/do.htm (accessed January 3, 2014)

Suber, P. (2009). Open access policy options for funding agencies and universities. The SPARC Open Access Newsletter, issue 130 available at: http://www.earlham.edu/~peters/fos/newsletter/02-02-09.htm#choicepoints (accessed January 3, 2014)

Suber, Peter and Nair, R. and Hussain, K. H. (2009). Open Access to public funded research: a discussion in the context of Mahatma Gandhi University digital archives of doctoral dissertations. International CALIBER 2009: Retrieved from http://www.inflibnet.ac.in/caliber2009/CaliberPDF/8.pdf (accessed January 1, 2014).

Swan, A. (2006). Overview of scholarly communication. In N. Jacobs (Ed.), Open access: key strategic, technical, and economic aspects (p. 3-12).Oxford: Chandos Publishing.

Swan, A. (2006). The culture of open access: researchers' views and responses. In N. Jacobs (Ed.), Open access: key strategic, technical, and economic aspects (p. 65-72).Oxford: Chandos Publishing.

Swan, A. (2007). Open access and the progress of science. The American Scientist. Retrieved from wwvv.americanscientist.org on 17 October , 2013.

Spink, A., & Robins, D. (1996b) . Electronic publishing of book reviews: Implications for scholarly communication. In C.T. Meadow,

Swan, A. (2007). Open access and the Progress of Science. The American Scientist, available at: .americanscientist.org (accessed January 4, 2014).

Swan, A. (2006). Overview of scholarly communication. In N. Jacobs (Ed.), Open access: key Strategic, technical, and economic aspects (pp. 3-12).Oxford: Chandos Publishing.

Terry, R.& Kiley, R. (2006). Open access to the research literature: a funder's perspective. In N. Jacobs (Ed.), Open access: key strategic, technical, and economic aspects (p. 101-109). Oxford: Chandos Publishing.

Taylor, S. J. (2009). Coming full circle: scholarly communication and the role of liaison librarians. IAMSLIC Conference Proceedings 2008 (pp. 23–27). Retrieved from http://hdl.handle.net/1912/2876 (accessed January 4, 2014)

Tise, ER. 2010. Isolation and information famine stifling Africa's growth. IFLA journal, 36 (1): 5-6.

Toffler, A. (1990). Power shift: knowledge, wealth, and violence at the edge of the 21st century. New York: Bentam Books.)

Unsworth, B. (1996). "Publisher's message". From: The International Journal of Science Home Page. December 31, 1996. Available from: http://www.netscijournal. com/docs/publish.htm

Voges, W. (2008). Open access in the natural sciences. In Open access: opportunities and challenges

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Appendix A: Questionnaire for postgraduate's students and academics staff

Dear respondent

I kindly request you to participate in this survey that aims to investigate the status of electronic publishing and scholarly communication among academic communities in Ethiopia higher learning institution. The main principle of electronic publishing is an open accessibility of scientific knowledge to the academic communities over the Internet or through locally implemented open sources software.

This survey focuses on ascertaining your awareness of e-publishing and scholarly communication within institutional repositories (a central storage or database of the institution's own research results) and seeks your views on several aspects of increasing the performance of the users. Your views are highly valuable regardless of whether you already have experience with e-publishing or not, as it is your personal opinion that matters since there is no right or wrong answers. Results from this survey form a crucial component of this research and would provide an important input in recommending the most suitable model for dissemination of scholarly communication by capitalizing on the current institutional repositories developments in the universities. Your answers would be treated with high confidentiality and the data would never be transferred to a third party for another purpose. Survey results would only be used for scientific purposes.

I appreciate the value of your views. Please do not hesitate to contact me for clarification on any aspect in this questionnaire at the following address.

Mr. Mniyichel
MSc student (University of Jimma)
E-mail: ethio2000mniyichel@gmail.com
Mobile No.:+251912347035

Section A: General information

The following questions are for classification purpose only. They would not be used to identify any individual. Please fill in only one response per question.

1.1 Which university are you from?

Addis Ababa University □ Wolkite University □ Jimma University □

1.2 What is your gender? □ Male □ Female

1.3 Which community are you attached to?

Academic staff Postgraduate students

1.4 Please select your Academic rank

□ Graduate assistance □ Assistant professor

□ Assistant lecturer □ Associate Professor

□ Lecturer □ Full Professor

Section B: Electronic publishing and scholarly communication practices in your institution

1. Please indicate the extent to which you agree or disagree with each of the following statements regarding Current electronic publishing and scholarly communication practices in your institution 1= strongly disagree, 2 = disagree, 3 = are undecided, 4 =, agree 5 = strongly agree

SN	Statement	1	2	3	4	5
1	My University selects, organize and disseminate electronic resources based on users need					
3	My University have an a central storage or database of the institution's own research results to display its information to the university communities					
4	In my University there is an incentive for e-publishing performance that is tied to successful achievement of scholarly communication					
5	In my University employees use groupware like group mail to communicate work related information in a group					
6	In my University I can access relevant electronic documents to my work stored in a central storage or database of the institution's own research results (institutional repositories).					
7	There is reward and compensation system in my University for the researcher contribution of scholarly documents					

Section C: Awareness of researcher, postgraduate's students and academic staff about e-publishing and scholarly communication

It includes institutional repositories (a central storage or database of the institution's own research results) and e-publishing and scholarly communication .The aim of institutional repositories is to aid the management and dissemination of the increasingly copious amount of scholarly documents produced by academics.

1. Is there any a central storage or database of the institution's own research results for accessing or disseminating scholarly information?

   □ Yes □ No

2. If yes for question #1 how long have you been using institutional repositories for accessing or disseminating scholarly information?

   □ 1–5 years □ 11 ≥ yrs

   □ 6–10 years □ No experience at all

3. How did you acquire the institutional repositories usage skills? (Tick all that apply)

   □ Self-learning □ Workshops

   □ Training by the University ICT Centre □ Training by the University library

   □ From friends/colleagues

   □ Training abroad □ Formal classes/courses

   others ((Please specify): ……

4. How do you rate yourself regarding institutional repositories usage skills in terms of accessing or dissemination scholarly information? (Tick appropriate box)

   □ Excellent □ Fair

   □ Very good □Poor

   □ Good

5. How to indicate internet facilities in your institution?

   □ Excellent □ Fair

   □ Very good □Poor

   □ Good

6. Have you ever heard about electronic publishing before this survey? (Tick appropriate box)

□ Yes □ No

(If your answer is No, skip #7 go to #8)

7. How did you know about electronic publishing? (Tick ALL that apply to you) Following

□ Internet debate about electronic publishing

□ Heard about it from my colleague

□ Heard about it from my teacher

□ Heard about it from researcher promotion

□ Heard about from my University library

Other (Please specify): ……

8. How likely is it for you to publish in electronic format in the near future (Tick one box for your appropriate answer?)

□ Very likely

□ Likely

□ Unlikely

□ Very unlikely

9. Please describe how you exchange scholarly documents with your colleagues inside your institution

□ E-mail

□ Institutional repository

□ Disciplinary/subject repository

□ Your personal website

□ Journal publication

□ Conferences Seminars/workshops

□ posting on websites

Other (Please specify): .....

10. To what extent do you agree or disagree about reasons to increase communication in access or disseminate scholarly documents? Tick one box against each statement - Key: 1= strongly disagree, 2 = disagree, 3 = are undecided, 4 =, agree 5 = strongly agree

SN	Statement	1	2	3	4	5
A	Publish more research output in electronic format					
B	Improve Internet connectivity					
C	Establish institutional repositories					
D	Provide institutional funding for e-publishing Movement					

Section D: challenges in the accessibility and dissemination of scholarly documents' within institutional repositories

1. How important are the following factors or conditions in influencing your decision to publish in institutional repositories outlets in the future? (Tick one box against each statement - Key: 1 = I do not know/no opinion; 2 = Least important 3 = Less important; 4 = Important; 5 = Very important

SN	Statement	1	2	3	4	5
A	Leading researchers in the institution publish article in institutional repositories outlets					
B	When colleagues/friends publish article in institutional repositories outlets					
C	When Research funding offices require researchers to publish article in institutional repositories outlets					
D	When institutional policy recommends and enforces institutional publishing to appear on institutional repositories outlets					

2. To what extent do you agree or disagree about the following facilities and support conditions for scholarly communications at your institution (Tick one box against each statement - Key: 1= strongly disagree, 2 = disagree, 3 = are undecided, 4 =, agree 5 = strongly agree

SN	Statement	1	2	3	4	5
A	I have the necessary knowledge to publish my work in scholarly communication outlets					
B	I have the necessary resources to publish my work in communication outlets (e.g. IT infrastructure, Internet access …)					
C	Guidance is available for me to use the Internet effectively for information Access					
D	My institution recognizes electronic publishing for my carrier development (promotion criteria)					

3 Have you published on e-publishing outlets /platform?

□ Yes □ No

3 If you have never published on e-publishing outlets /platform your scholarly output what are the reasons? *Tick one box against each statement*- Key: 1= strongly disagree, 2 = disagree, 3 = are undecided, 4 =, agree 5 = strongly agree

A	Insufficient skills to publish article in institutional repositories	1	2	3	4	5
B	Inadequate technological support					
D	Limited access to scholarly communication documents					
E	Unorganized/unclear research strategy					
F	Institutional research policy					
G	Low personal motivation					
H	Low Financial support					
I	Longer peer review process					
J	Limited e publishing platform					
I	Other reasons [Please elaborate]……					

4 To what extent do you agree or disagree about the main problems you face while using institutional repositories? (Tick one box against each statement - Key: 1= strongly disagree, 2 = disagree, 3 = are undecided, 4 =, agree 5 = strongly agree

SN	Statement	1	2	3	4	5
A	The university institutional repository is complicated to use.					
B	It is not compatible with the existing world scholarly communication					
C	My University institutional repository is not well organized and indexed					
D	The system is not dynamic					
E	The user interface is not attractive or friendly					
F	Lack of integration with the library catalog					
G	Insufficient reference link(to ,from)					

5 To what extent do you agree or disagree about the opportunity to build up electronic publishing and scholarly communication in Ethiopian universities? Tick one box against each statement - Key: 1= strongly disagree, 2 = disagree, 3 = are undecided, 4 =, agree 5 = strongly agree

SN	Statement	1	2	3	4	5
A	Increased Universities motivation towards research					
B	Technology support has become available and advanced to build e-publishing					
C	Increased dynamicity of ways of communication					
D	Broadband connectivity is becoming available and faster					
E	Various Institutional system development to carry out day to day activities					
F	A shift from traditional printed format to electronic format					
G	Mass education program in Ethiopia					
H	Favorable research strategy and policy					
I	University Industry linkage and partnership					

6 In your institution context, what would be the possible solutions to the challenges regarding e-publishing and scholarly communication? (Tick all that you support).

- Adequate infrastructure has become available and advanced
- Sufficient human skills would be developed
- Create research Promotion means
- Produce clear/appropriate strategy and policy for the institutions

Other benefits (Please specify):……

Section E: Effect of electronic publishing and scholarly communication to academic communities.

1. How do you rate the importance of establishment of an electronic publishing outlet for archiving and wider dissemination of research output at your University? (Tick one box against your appropriate answer)
   - Very important
   - Important
   - Less important
   - Least unimportant

2. In your view, what would be the benefit of electronic publishing scholarly documents in the institutional repository? (Encircle all that you support)

 Wider Accessibility and Dissemination

 Scholars would publish article more

 Easy archiving

 Quality and quantity of research would increase

 Improved learning and teaching activities

 Community services

 Enhanced University-industry linkage

Other benefits (Please specify):……

1. How important is scholarly documents that have not undergone through the scholarly communication process before depositing them in the repository? (Tick one that applies to you)

 Very important

 Important

 Less important

Least important

2. To what extent do you agree or disagree with the following statements about the anticipated outcomes of electronic publishing and scholarly communication. (Tick one box against each statement - Key: 1= strongly disagree, 2 = disagree, 3 = are undecided, 4 =, agree 5 = strongly agree

A	Scholarly communication enable scholars to publish more quickly (turnaround time from submission to publishing is short	1	2	3	4	5
B	Electronic publishing increases research impact by such works being highly used and cited					
C	Scholarly communication improve accessibility to scholarly literature because it is free and without access limitations					
D	Electronic publishing enables researchers in Ethiopia to access literature more Easily					
E	Electronic Publishing in communication outlets exposes scholarly work to a large potential					
	It enhances learning, teaching, research and service activities to the learning Institutions					

3. Do you have any other comments regarding e- publishing in general? (Please elaborate)……

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Appendix B: Interview for research coordinator, Librarian and IT professional

Introduction

I'm conducting a study aiming at investigate the status of electronic publishing and scholarly communication among communities in Ethiopia higher learning institution. As a member in the university research administration, you are kindly requested to participate in this interview being addressed to representative stakeholders with an interest in improving scholarly communication and e-publishing in the higher institution. The interview is about e-publishing which enables the widest possible dissemination of scholarly contents by removing barriers that prevent access to scholarly outputs. The focus of the Interview is to ascertain your awareness of this development within scholarly communication; to seek your views on several aspects of electronic publishing and find out whether your institution is likely to promote the uptake of scholarly communication in your university.

Results from this survey form a crucial component of my paper and would provide an important input in recommending a most suitable model for dissemination of scholarly output by capitalizing on the current ICTs developments in higher institution.

I would appreciate the value of your views.

Background information

B1. Name of University: _____

B2. Respondent's Position: _____

B3. Respondent's gender: _____

1. How do you say about your university practice or experience in creating, generation, organization, retention, utilization and Dissemination of electronic resources?

   _____

   _____

   _____

2. Does the library support or contribute to e-publishing and scholarly communication?
3. How to disseminate scholarly documents' for scholars, research and others user?
4. How does your institution communicate its research reports, theses, dissertations, and other resources such as course/training materials to users of such information resources?
5. What do you think are the benefits of electronic publishing and scholarly communication for teaching and learning process in Ethiopian higher learning institution?
6. Does your institution have an institutional repository (a central storage or database of the Institution's own research results?
7. . How do you say on the usage of medium and the extent for scholarly communication practices among the staff in your University?

   - E-mail
   - Organizational website or locally implemented open software
   - Internal computer networks/ LAN
   - Internet connection
   - Video conferencing
   - Electronic document storage and access

8. Research is among the missions of your institution, does your university have any strategy to maximize the dissemination of its research output nationally and internationally? If so explain. What are the barriers hindering the dissemination of research outputs?

_____

_____

_____

_____

9. How does the university document its research documents/technology to ensure its track since the institution was established?
10. To what extent do you agree or Disagree with you observation as far as dissemination of scholarly documents from your institution is concerned? What are your reason(s) to agree or disagree?
11. Which do you think is the most appropriate unit within your university setup that is better placed to manage the e-publishing outlet if established? What are the reasons to support your suggestion?
12. Is there anything else you would like to say about the problem / challenges of electronic publishing and scholarly communication in your institution? _____

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Appendix C: Observation checklist

	Jimma University		**Wolkite university**		**Addis Ababa university**		
Observations	**Availability**	**Efficiency**	**Availability**	**Efficiency**	**Availability**	**Efficiency**	**Remark**
Intranet							
Organizational website							
Computers / servers							
Internal networks or LAN							
Internet connection							
Institutional repositories							
Available Scholarly documents							
Proper storage and management							