

**UNIVERSITY OF GHANA
COLLEGE OF EDUCATION
SCHOOL OF COMMUNICATION AND INFORMATION STUDIES
DEPARTMENT OF INFORMATION STUDIES**

**ENHANCING TEACHING, LEARNING AND RESEARCH: ASSESSMENT OF
THE IMPACT OF THE INSTITUTIONAL REPOSITORY OF THE
UNIVERSITY FOR DEVELOPMENT STUDIES, TAMALE**

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DECLARATION

I, **ABASS K. IBRAHIM**, hereby declare that this study has been carried out by me at the Department of Information Studies, University of Ghana, under the supervision of Dr. Emmanuel Adjei and Professor Perpetua S. Dadzie

I firmly declare to the best of my knowledge that this research work has not been presented in whole or in part anywhere for an award of a degree. All sources of information used have been duly acknowledged.

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Date

DEDICATION

This work is dedicated to my wife, Sumaya Mohammed and my children, Nihad, Abdul Jawad, Hamdiya and Ibrahim Abass for their understanding and support. It is also dedicated to my late elder brother, Hussein Ibrahim (H. Ibrahim) on whose advice my father gave me education.

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To Allah is the glory.

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ABSTRACT

The study assessed the impact of institutional repositories in enhancing teaching, learning and research in academic institutions. In particular, this study assessed the impact of the institutional repository of the University for Development Studies (UDS), Tamale, on teaching, learning and research in the university. The objectives were to assess the level of institutional repository (IR) awareness among faculty members and graduate students and the level of contribution of depositors to the institutional repository. The study also assessed the role of institutional repositories in teaching, learning and in the research lifecycle of faculty members and students of academic institutions. The study further examined the challenges that confront both faculty members and students in the utilization of the IR of UDS. Some appropriate recommendations for policy interventions based on the findings of the study to improve on the utilization of the institutional repository of the University for Development Studies, Tamale were made by the study. The study made use of both qualitative and quantitative data. The total sample population was 988 made up of faculty members, graduate students and the managers of the institutional repository on the four campuses of the university. Questionnaires and interviews were used to collect the data for the study. The data obtained from the questionnaires was analysed using the Statistical Package for Social Science (SPSS) version 23 whilst the data from the interviews was analysed thematically. Data from the questionnaires were presented first followed by the data from the interviews. The major findings of the study reveal that there is high level of awareness amongst the faculty members and graduate students of the UDS. This high level of awareness has not yet translated into high deposits in the institutional repository, although the rate of submission is beginning to appreciate as compared to previous rates. Another major finding is that faculty members find it difficult to upload their documents themselves and have to rely on library staff to upload it for them. One other finding is that faculty members did not face challenges with

copyright but were confronted with the fear of plagiarism. The lack of ICT infrastructure and lack of power generators were also some of the major findings of the study. It was recommended that training programmes are organised for faculty members to be able to do self-archiving. During such training programmes issues of plagiarism could be explained to the understanding of faculty members. There is, also the need for the university administration to install power generators on all the four campuses of the university. ICT connectivity and infrastructure should be improved by paying for more bandwidth and by providing more computers, scanners and printers.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The role of institutional repositories in academic institutions cannot be underestimated. The increasing demand for the efficient delivery of teaching, learning and the conduct and dissemination of research, coupled with the changing needs of faculty members and students have compelled academic institutions to adopt institutional repositories. Advancements in information technology which resulted in the creation of new digital publishing channels, worldwide networking, and increased communication among researchers are among the factors that have compelled academic institutions to establish institutional repositories in order to overcome the digital challenge (Ammarukleart, 2017).

Institutional repositories have been defined as online systems developed by universities, research institutions and other organisations to manage, preserve, store and disseminate their research products in electronic format (Hossain, 2010). The research output consists of theses, dissertations, conference papers, books, journal articles, published and unpublished learning and academic materials. By putting the research output of the parent institution online institutional repositories provide an avenue for increased accessibility to research output thereby reducing the monopoly of journal publishers and the cost of journal subscription (Chirwa and Sife, 2018).

Also, by making theses, dissertations and other learning materials online institutional repositories facilitate learning by allowing students to engage in learning anywhere and anytime. The sharing and use of the information resources provided by institutional repositories will therefore result in

increased efficiency and quality in the development of new learning materials and courses. (Cohen, Kalimi and Nachmias,2013).

Kakai (2018) asserts that by putting the research output of academic institutions online to a global audience institutional repository increase the visibility and reputation of their parent institutions. According to Chirwa and Sife (2018) institutional repositories have therefore become a necessary facility of any academic and research institution. Similarly, Abrizah (2009) asserts that institutional repositories are now a part of the technical infrastructure in academic and research institutions and are a better alternative for providing access to research output.

Institutional repositories have also served to bring together on one platform grey literature, such as theses and dissertations, lecture notes, unpublished research reports, seminar and conference papers (Kakai, 2018). By disseminating and archiving locally generated literature institutional repositories serve in the acquisition, preservation and dissemination of local content. Kakai (2018) therefore posits that institutional repositories have the ability to solve the problem of lost grey literature in universities and research institutions. Institutional repositories therefore play an important role of ensuring that the vast intellectual resource which is often lost on several scatted peripheral storage devices of the authors are preserved as an institutional knowledge base for faculty members, students and other researchers.

Institutional repositories have the potential to increase not only the visibility and accessibility but also the impact of research in Africa. Institutional repositories do this in addition to maintaining and preserving the research output of Africa. (Chisenge, 2006) as cited in Abdelrahman(2017).

Institutional repositories by providing an avenue for communicating the research output of the university enables faculty members, students and other users to read and cite the authors whose works have been deposited in the institutional repository. In addition, faculty members, researchers and students of academic institutions use institutional repositories to access journal articles and other relevant resources for research and learning purposes. Institutional repositories therefore provide a broader knowledge related to the research that is carried out by faculty members and students (Dlamini and Snyman, 2017)..

Budu (2015) stressed the need for universities to make information accessible as this will ensure the success of research, teaching and learning. As Armstrong (2014) succinctly puts it the dissemination of research is a central mission for all universities. Access to research output is a fundamental requirement to ensure research quality. According to Anenene,, Alegbeleye, and Oyewole, (2017) the key criterion used to measure the quality of a university is the quality and quantity of its research output. Institutional repositories by making this research output of university available to scholars on a global scale puts the knowledge base of the institution on a platform that will raise the status and value of the university and faculty.

According to the Directory of Open Access Repositories (OpenDOAR) (<http://www.opendoar.org>) as at April 2019 there were 4124 institutional repositories in the world from an initial figure of 88 in 2005. Open DOAR also reveals that Africa has 202 institutional repositories with 41 of them in

universities in South Africa. With less than 5% of the IRs in the world African institutions are not adequately represented on the on internet and this may account for the lack of visibility of African universities on the global stage hence their low ranking. The University of Cape Town which is the best university in Africa is ranked 156 out of 1,250 universities globally (Times Higher Education, 2019) implying that not even one African university is ranked among the best 100 universities in the world.

Chirwa and Sife (2018) examined Africa's contribution to the worldwide open access directory and discovered that Africa had only 0.14% of the documents on the OpenDOAR. An indication that African universities are not seen on the Internet as compared to their counterparts outside the continent. It is however believed that institutional repositories can address this challenge, hence a case for their development. According to Chirwa & Sife (2018) African higher educational institutions need to utilize the presence of the open access movement and the availability of information communication and technology to develop the capacity of their researchers and their institutional repositories to increase accessibility to and availability of research products of their faculty members and students.

The failure of researchers in Africa to disseminate their intellectual output to their counterparts on the continent and beyond puts them at a disadvantage as they are unable to know what other researchers outside the continent are working on. This makes collaboration between African researchers and their counterparts elsewhere difficult. According to Nemati-Anaraki and Tavassoli-Farahi (2018) African researchers do not benefit from other researchers elsewhere because they are unaware of research areas their counterparts in the same discipline are working

on. The important ingredient and benefit of research conducted internationally is therefore lost to the African scholar. The solution lies in the adoption of IRs which would connect researchers and other scholars to facilitate collaboration and its benefits to African scholars.

Universities and research institutions in Ghana like their counterparts all over the world have also adopted IRs to manage their research outputs. According to Corletey (2011) the Kwame Nkrumah University of Science and Technology (KNUST) was the first institution to adopt an institutional repository in Ghana in 2008.

Similarly, the important role of an IR can be seen at the University for Development Studies where Thompson, Akeriwe and Aikins (2016) report that with the setting up of the institutional repository at the University for Development Studies (UDS) the UDS was ranked 3rd from the previous 9th position the university held in the web ranking of universities in Ghana.

Despite the benefits associated with the adoption and use of institutional repositories (IRs) by academic institutions IRs cannot be sustained without an impact assessment of their activities on teaching, learning and research. There is a dearth of literature on impact of IRs on teaching, learning and research in academic institutions in Ghana.

1.2 Brief History of the University for Development Studies

The University for Development Studies (UDS) is a multi-campus public university established in northern Ghana in May 1992. The University derives its mandate from the Provisional National Defence Council (PNDC) Law 279. The UDS is the only university in Ghana that runs a trimester system. All the rest run a semester system The Faculty of Agriculture was the first to be

established in 1993 with a student population of 40 (*Student's Handbook, University for Development Studies, 2017*). Campuses of the UDS are located in three regions in across Ghana. These are the two campuses in Nyankpala and Tamale in the Northern Region, Wa campus in the Upper West Region and Navrongo in the Upper East Region.

The UDS is also expected to bring together academic work and community outreach in order to create an enabling environment for the advancement of the wellbeing of the communities in northern Ghana in particular and the other regions of the country.

The UDS has a graduate school charged with the responsibility of running graduate programmes on all the four campuses of the University. The UDS has 633 faculty members and 20039 students which includes 346 graduate students (University for Development Studies Statistics, 2018). The university currently consists of 15 faculties, schools and institutes, and 4 campuses. Education, medicine and allied health sciences are the programmes offered at the Tamale Campus. Programmes available at the Nyankpala Campus include agriculture, agribusiness and communication sciences, and renewable natural resources. Some of the programmes at the Wa Campus are business studies, development studies, law and planning. Computer and mathematical sciences are offered on the Navrongo Campus.

The University has a unique programme known as the Third Trimester Field Practical Training (TTFPT) which students go to live in communities in order participate in activities in the

communities by so doing and with assistance of the communities identify the developmental challenges confronting those communities.

1.2.1 The UDS Library System

The UDS Library complex operates on all the 4 campuses of the university to provide information resources and other services to support teaching, research and learning of this multi-campus university. The main or central library is housed at the Nyankpala campus of the university while each of the 3 sites of the Tamale Campus has a library; namely the main campus at Dungu, the Tamale Teaching Hospital (TTH), and the Graduate School. The central library has oversight responsibility over the activities, services and operations of the libraries on the other campuses. The institutional repository was set up at the central library, Nyankpala Campus, Nyankpala.

The UDS Library has been a member of the Consortium of Academic and Research Libraries in Ghana (CARLIGH) right from the inception of the Consortium in 2004. The Library has therefore benefitted from its membership in the area of subsidised electronic journal subscription and the training of library staff in the form of workshops and seminars.

1.2.2 UDS Institutional Repository

The University for Development Studies Institutional Repository is also known as UDSSpace uses an open source software, namely the DSpace. The repository was established in March, 2014 and begun full operations in May, 2014. (Thompson, Akeriwe and Aikins, 2016).

The UDS institutional repository offers two main services to staff, students and other users. The first is the interactive service whereby faculty members, researchers and students are facilitated to submit their documents or access archived documents. The second service which is the operations service involves the Central Library with technical assistance from the Information Communication and Technology (ICT) Directorate of the University assists faculty members and researchers of the university to store, preserve, back up, and recover their works.

The UDS IR contains research articles, seminar presentations, book chapters and books, theses and dissertations of graduate students and faculty members and graduate students, conference proceedings, institutional journals, lecture notes and teaching resources. Other materials that can be found on the IR include Third Trimester Field Practical Training (TTFPT) reports, documentaries, technical reports, University handbooks, maps, plans or blueprints, and software samples. As a matter of policy, the IR does not accept items that are of temporary value/ephemeral nature, have controversial, derogatory, pornographic or discriminatory content or are of commercial for administrative use to the University.

Documents on the UDS IR are organised into communities and sub-communities which are further sub-divided into collections for easy browsing. There are ten (10) communities which include fifty-nine (59) collections. All newly submitted articles produced and sent by an author can be viewed at a glance using the RSS feed. The names of the contributing authors are shown with the corresponding number of their academic production deposited in the repository. These names are sorted in ascending order based on the author with the most elements in the repository.

The UDS IR builds its content mainly through self-archiving or mediated archiving. In addition, hard copies of old theses and dissertations have been digitized and archived in the IR. In line with the practice in most universities it is mandatory for graduating students especially postgraduates to deposit electronic copies of their thesis to the Library. The UDS IR has 2075 documents including 720 graduate theses and information from the *UDS International Journal of Development* (UDSIJD), the *Ghana Journal of Science, Technology and Development* (GJSTD) and the *Ghana Journal of Development Studies* (GJDS). These are all journals produced by the University (Thompson, Akeriwe and Aikins, 2016).

Currently, most of the content of the UDS IR is recruited through mediated archiving by IR staff and self-archiving by a few faculty members. Aside soliciting articles and publications from faculty, the IR staffs also digitize retrospective theses to be included on the repository. This rate of populating the UDS institutional repository is relatively slow which can lead to loss of interest by faculty members as well as discontinued patronage of the IR and subsequently its demise.

1.3 Statement of the Problem

There is currently a worldwide adoption of Institutional repositories by tertiary educational institutions as an information technology infrastructure to facilitate teaching, learning and research among staff and students in an efficient manner. This accounts for the exponential growth of IRs from an initial figure of 88 institutional repositories in 2005 to 4124 institutional repositories spread across the globe as at April 2019 (OpenDOAR, 2014).

The universal acceptance of IRs has come about because of the numerous benefits which the institutions, users and researchers stand to gain by adopting institutional repositories. IRs by capturing and putting online the intellectual output of the institution gives both the institution and the author visibility on the world stage as researchers elsewhere cite and quote them. Students on their part follow links provided by the IR to retrieve information resources to facilitate their learning (Anenene, Alegbeleye, and Oyewole, 2017).

Despite these benefits faculty members and students continue to lose valuable media asserts such as videos, audio, presentation materials, datasets, research works in progress, unpublished and published works, lecture notes and students assignments which they fail to deposit with the repository.

Globally, higher educational institutions face a great challenge of capturing and organising their digital intellectual assets and publicizing these to researchers and students outside their institutions. Faculty members and students often lack the capacity to preserve their research output for perpetuity except to store them on their personal computers.

According to Nwagwu (2013) as cited in Fox and Hanlon (2017) African researchers do not publish outside the continent and are therefore perceived as users but not contributors to the world of knowledge. Molteno (2016) finds it a contradiction that the African continent more than fifty years after independence and in what is supposed to be the Information Age where with a few clicks of the button a vast amount of the knowledge of the world is immediately accessible,

African intellectuals and researchers remain largely invisible. Institutional repositories are therefore seen as one of the ways to overcome this challenge and make the intellectual output of African authors visible and accessible on the global stage.

Educational and research institutions in Africa are perceived to be lagging behind their counterparts elsewhere in the global acceptance of institutional repositories as a valuable tool for disseminating their research outcomes. Moahi (2009) as cited in Martin – Yeboah (2015) reports that African countries are graded very low in terms of intellectual production because a large part of the research produced by African academics and researchers are often not published but rather remain on shelves and desks in the various institutions of learning.

Institutional repositories provide the option of managing and organizing intellectual assets such as audio-visuials, datasets and presentation materials. Lecture notes, students assignments as well as other grey materials produced by the faculty members and students. This internally generated intellectual property must be captured and preserved by the IR since most of it will not be published in any scholarly journal and therefore will be lost forever (Dlamini & Snyman, 2017).

The situation in Ghana is not different as university libraries and libraries of research institutions are constrained by the lack of access to documents which are products of studies undertaken in their institutions and in the country (Lamptey and Corletey, 2011). This hinders the ability of the library to make available the necessary facilities to support quality teaching, learning, research and

the dissemination of information. Lamptey & Corletey (2011) therefore advocate for improvement in institutional Open Access repository (OA-IR) as an alternative solution.

The lack of a positive attitude has engaged the attention of scholars over the years because the performance of an institutional repository is often determined by its content which in most cases is the contributions of the faculty. Cullen & Chawner (2010) have concluded that although the concept of institutional repositories has been accepted by professional librarians and university administrators the concept seems to be problematic with the academic community for whom it was formulated.

The problem at the Institutional Repository (IR) of the University for Development Studies (UDS) is that despite the establishment of the IR faculty members of the university have not been publishing through the IR. Although a high percentage of the faculty members are aware of the IR, they have failed to deposit their documents on to the repository. This is confirmed by Thompson, Akeriwe and Aikins (2016) in a study in which the authors examined the advocacy and promotional strategy of the IR of the UDS and found that although most of the respondents (80.3%) had knowledge about the benefits of an institutional repository and 66.2% had some level of awareness of the existence of the UDS IR, as high as 86.8% of the respondents had not deposited on the IR. This situation does not allow both the faculty and students to benefit from the IR which includes using the IR to facilitate teaching, learning and research in the UDS. This situation therefore calls for attention.

In addition to the above, informal observation by the researcher at the UDS shows that most of the teaching and learning involves the use of analogue teaching and learning materials. These materials are not being submitted for digitization and preservation on the institutional repository and are therefore lost to the university community as they never get published. Seminar presentations, student assignments and other course materials were not being preserved on the IR. This internally generated intellectual output must therefore be captured, indexed and properly harnessed into an institutionally-based knowledge that could be used for purposes of funding, accreditation, and to communicate with other researchers within and outside the institution.

1.4 Purpose of the Study

The purpose of the study was to assess the impact of institutional repositories on teaching, learning and research using the institutional repository of the University for Development Studies, Tamale as a case study. The study made use of the Technology Acceptance Model (TAM) by examining the factors that influence the utilization of an institutional repository by faculty members and students.

1.5 Objectives of the Study

This study was guided by the following objectives:

1. To examine the level of awareness of faculty members and students about the Institutional Repository (IR);
2. To examine the degree to which faculty members are willing to contribute their documents to the IR;
3. To assess the role of institutional repositories in facilitating teaching;

4. To examine the role of institutional repositories in facilitating learning;
5. To assess the role of institutional repositories in facilitating research;
6. To examine the challenges that confronts both faculty members and students in the utilization of the IR of UDS.
7. To proffer some appropriate recommendations for policy interventions based on the findings of the study to improve on the utilization of the institutional repository of the University for Development Studies, Tamale.

1.6 Theoretical Framework

Adom, Hussein, and Agyem (2018) define a theoretical framework as a blueprint or building design on which *the* researcher constructs a building or conducts a research investigation. The conduct of every research is based on the theoretical framework which serves as the basis on which the research is built. A theoretical framework therefore assists the researcher in the choice of an appropriate research approach, analytical tools and procedures for his/her research inquiry.

There are various models for the study of the factors that determine the endorsement or rejection of new technologies by individuals. These models include the Model of PC Utilization, Diffusion of Innovation theory, Theory of Planned Behavior (TPB) and, Theory of Reasoned Action (TRA), , Motivational Model, Unified Theory of Acceptance and Use of Technology (UTAUT), Social Cognitive Theory and Technology Acceptance Model (TAM) among others.

Among the models and framework, the Technology Acceptance Model (TAM) is deemed the most appropriate and widely used theory to describe the acceptance of an information system by a

person. The Technology Acceptance Model (TAM) was originally proposed by Davis (1986) as cited in Lee, et. al. (2003) to predict the acceptance and use of information technology, especially on the job. To understand how perception influences the use and acceptance of technology this model demonstrates how the perceived usefulness (PU) and perceived ease of use (PEOU) determines the behavioural intention of an individual to use a technology and their attitude towards using it. TAM is based on the assumption that the acceptance of an information system by an individual is determined by two major variables:

1. Perceived Usefulness (PU) and
2. Perceived Ease of Use (PEOU).

1.6.1 Perceived Usefulness (PU)

The unsubstantiated view of an individual about how the use of something will positively change their productivity is referred to as the Perceived Usefulness. It is also the biased probability of the potential user that the use of a given system will improve his or her action. The degree to which a person believes that using a particular system will improve his work performance. Perceived Usefulness can also be defined as the perception of the potential user that the use of some technology will positively change his or her job performance (Davis, 1989).

1.6.2 Perceived Ease of Use (PEOU)

The expectation of an individual about how easy the use of a certain technology will be is often referred to as the Perceived Ease of Use. The perception of a potential user about how easy a target system can be manipulated or operated (Davis, 1989). If faculty members and students perceive the institutional repository to be a system that requires one to put in less efforts to operate

then they will keep using it. However, if the respondents find the target system, in this case the institutional repository, difficult or cumbersome to use then they will stay away from using it.

The belief of a person in a system can be influenced by other factors referred to as external variables in TAM. The external factors together with either the Perceived Ease of Use or the Perceived Usefulness influence the attitude toward using the system, the behavioural intention to use the system and the actual use of the system.

1.6.3 Attitude

Attitude refers to the general feeling of preference or lack of preference in performing behaviour. Attitude often influences the behaviour which also determines the actual acceptance. In the current study, the expectations of the respondents about how easy it will be to use the institutional repository and expected benefits of using the institutional repository (IR) influences the attitude towards IR acceptability and usage.

1.6.4 Behavioural Intention (BI)

According to TAM the behavioural intentions to utilize a certain technology determines the behaviour or actual use of that technology. The perception of the most probable behaviour of an individual in a given situation is often influenced by the PEOU and PU.

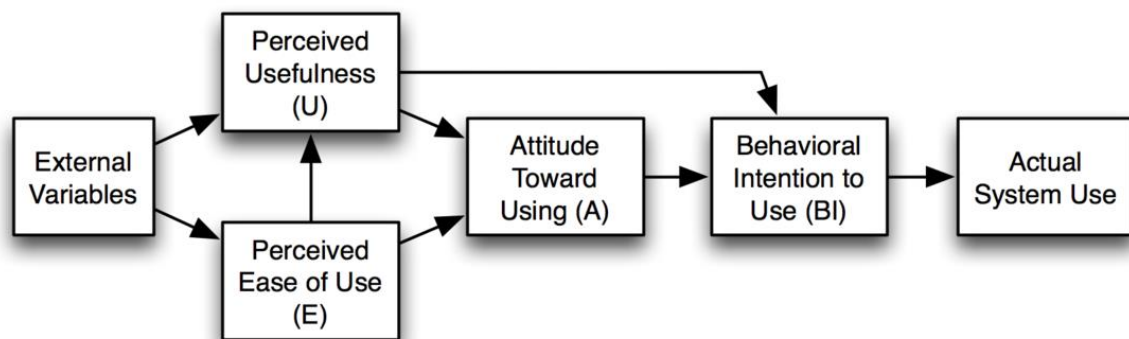
1.6.5 Behaviour/Actual System Use

The actual utilization of a system is determined by the behavioural intention which is also influenced by the perceived usefulness of the system acted upon by external variables. An

individual will employ a certain technology if his or her perception about the outcome of using it is that it will improve their current state.

The goal of the Technology Acceptance Model is to determine how individuals accept and utilize information technology, particularly at work. The model demonstrates how the expected benefits and the expected ease of use will determine the behavioural intention to use a system and also determine how the individual reacts towards utilizing it.

Figure 1.1



Source: Technology Acceptance Model (TAM) (Davis, Bagozzi and Warshaw. 1989).

The theoretical framework for this study will therefore be the Technology Acceptance Model (TAM). The theory was considered suitable for the study in view of fact that the use of institutional repositories by faculty members and students is greatly affected by their perception of the services they can get from an IR, as well as their perception of how easy it is to use the technology. A positive perception of the IR or even a good experience of it results in an effective use of it and vice-versa. If faculty members and students perceive that using the institutional

repository will improve research, teaching and learning, then chances are that they will appreciate and use the IR more.

With particular reference to this study, one would expect that the strategies put in place to market and promote the UDS IR team to get faculty members and students to use the IR would result in higher patronage of the IR. However, the use of the IR is not encouraging.

The researcher is also aware that the University Librarian or assignees are members of the Faculty/School Boards and use that opportunity to educate members about the IR at these meetings. The present study would therefore want to discover whether faculty members and students are using such services or otherwise, and its resultant impact on teaching, learning and research in the institution.

1.7 Scope and Limitations of the Study

This study is restricted to the Nyankpala, Navrongo, Wa and Tamale campuses of the University for Development Studies, Tamale. Although the UDS has both undergraduate and postgraduate students, only the postgraduate students and faculty members and the IR managers were sampled for this study. This is so because faculty members and postgraduate students are the two major contributors and users of the IR. Undergraduate students are not contributors. The study was also guided by and confined to the seven stipulated objectives so as to have a thorough investigation of the research problem.

1.8 Significance of the Study

Globally, institutional repositories have been embraced as tools that can be used to facilitate teaching, learning and research in institutions of higher learning. This study will provide information to management of academic institutions in the formulation of policy that will allow institutional repositories to play an efficient and effective role in facilitating teaching, learning and research in academic institutions.

At the institutional level, this study is significant because it will provide information to the management of the University for Development Studies (UDS) and the UDS Library in the formulation of policy that will enhance the utilization of the institutional repository.

The success of an institutional repository (IR) depends on the ability of the IR managers to solicit for funds from internal stakeholders who are beneficiaries and users of the IR. In order to make a strong justification to attract stakeholder attention, adequate statistics must be provided through a thorough assessment of the impact of the IR. The findings of this study will therefore help the IR managers and librarians to determine the precise IR activities that are likely to improve and facilitate teaching, learning and research in academic institutions. The provision of adequate statistics will also serve as a justification why management of institutions of higher learning should continue financing the institutional repository out of their limited resources.

Finally, the results of this study would help the UDS Library and other academic libraries operating in similar contexts to review existing policies on IR adoption in order to establish benchmarks for the operation of IRs in academic institutions. The challenges confronting institutional repositories in developing countries including Ghana are similar; therefore, although

this study focuses on Ghanaian institutions in particular the findings are relevant and applicable to other institutional repositories elsewhere.

1.9 Organization of Chapters

The study is organized into six chapters:

Chapter One: this chapter provides a background of the study, statement of the problem, purpose of the study, objectives, purpose of the study, significance of the study, the theoretical framework, and organization of the chapters.

Chapter Two: this chapter comprises a review of the related literature and empirical issues that pertains to the use of institutional repositories in facilitating teaching, learning and research. The review is done from a global, African and Ghanaian perspective.

Chapter Three: this chapter deals with the method used to operationalize the research objectives of the study. It consists of the research design, selection of case, selection of subjects for the study (that is population, sample size and the sampling technique), and the instrumentation for data collection. It discusses general to specific perspectives in relation to the study objectives.

Chapter Four: this chapter presents the data analysis. It gives a detailed analysis on data collected, presenting information about demographic, level of awareness, contribution to the IR, use of institutional repository, benefits of IR as well as the challenges associated with using IR.

Chapter five: this chapter comprises a detailed discussion on the major findings.

Chapter six: provides a summary of the major findings, conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents previous studies regarding institutional repositories in four different areas: an overview of institutional repositories, utilization of IRs in facilitating teaching, use of IRs in facilitating learning, the use of IRs in research and the challenges facing institutional repositories. Since this study focuses on how the content and services of institutional repositories impact on the scholarly activities of faculty, the highlight in this chapter on the research related to this area.

A literature review is a careful examination of what has been written and published by other scholars about a topic in a selected field of study. According to Polit and Hungler (1999) literature review involves searching and collecting information on a topic in order to develop a clear understanding of the state of knowledge on that topic. It is a part of an academic document, which includes current knowledge, including substantive discoveries, as well as theoretical and methodological contributions to a particular topic. Creswell (2015) affirms that a literature review provides a framework for establishing the importance of the study as well as standards for comparing the results with other findings.

Literature reviews usually use secondary sources which are consulted. This study therefore relies on various articles, books and other resources from both print and online sources. Similarities and differences will be drawn as well as recommendations made on the topic of assessing the impact of institutional repositories on teaching, learning and research in the UDS IR in particular.

The study reviewed the relevant literature on the following sub-themes;

1. Institutional repositories: an overview
2. Awareness and contribution of faculty members to Institutional Repositories
3. Use of Institutional Repositories in facilitating teaching,
4. Use of Institutional Repositories in facilitating learning
5. Use of Institutional Repositories in research
6. General Utilization of institutional Repositories
7. Benefits of Institutional Repositories
8. Challenges of institutional repositories

2.2 Institutional Repositories: An Overview

According to Bossaller and Atiso (2015) the concept of Institutional Repository like any new technology may not have one single accepted definition as different authors define it differently. However, two scholars whose definitions have been quoted by several authors are Crow and Lynch (Thompson, Akeriwe and Aikins, 2016). Crow (2002) in the Scholarly Publishing and Academic Resources Coalition (SPARC) position paper defines an institutional repository as the “*digital collections capturing and preserving the intellectual output of a single or multi-university community*”. On the other hand, Lynch (2003) defines an institutional repository 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. It is most essentially an organizational commitment to the stewardship of these digital materials, including long-term preservation where appropriate, as well as organization and access or distribution”.

Ukwoma & Mole (2017) on their part view an institutional repository as *“a platform which libraries adopt for managing research outputs for easy accessibility and to support teaching, learning and research. The institutional repository (IR) can be a dynamic, online collection of research, writing, and projects conducted by a university’s faculty and students.”*

Institutional repository has also been defined as an electronic storage of the research work produced by the faculty members, researchers and students of an institution and disseminated online to all users globally with little or no restriction at all (Johnson, 2002 as cited in Shukla and Ahmad, 2018).

Gibson (2009) agrees with Lynch’s definition since libraries mostly are concerned with services not technologies. However, the author indicates that although there is some ambiguity in terms of the definition of services IRs have some features in common that differentiates them from other types of services.

One common feature of IRs is that they contain different types of digital materials which can include text, video, audio and other learning objects. Another feature of an institutional repository is that it has a community of users as the focus of its services. The community of users also forms the authors of its content who most often are the faculty, students and research staff; therefore, an institutional repository shows the research output of an institution.

Institutional repositories also share a common feature of durability and permanence. The assumption is that when an item is deposited in the IR that item remains there for the foreseeable future.

Institutional repositories also allow their content to be searched by anyone with access to the internet. They therefore serve as sources of information which facilitates research, teaching, learning and other purposes thereby enhancing knowledge dissemination. This prevents duplication of research already carried out either by researchers of that institution or elsewhere.

2.3 Brief History of Institutional Repositories

A number of factors during 1990s gave rise to the emergence of institutional repositories. The availability of the internet and the World Wide Web in the 1990s led to a revolution in the way information was shared. These factors coupled with the serials crisis which resulted in the high cost of journals as against the shrinking budgets of academic libraries compelled scholars and librarians to look for alternatives which were cost-effective. Jones (2006) reports that the statistics of the Association of Research Libraries (ARL) show that the periodic costs between 1986 and 2004 increased by about 273%. To overcome this challenge of paying huge subscriptions to publishers of restrictive journals librarians and researchers with the development of enabling technologies developed Eprints as open source repository software in 2000.

The development of IRs was given a boost as universities in the USA and the UK established institutional repositories from 2002 onwards. These are the Cornell University and MIT in the USA and then Southampton University and Oxford University in the UK.

Several activities in line with the development of institutional repositories have taken place including conferences and issuance of policy statements on open access. The Budapest Open Access Initiative (BOAI) held in 2002 served as a declaration of commitment for scholars to preserve their work and for the creation of open access journals.

The “Berlin Declaration” then followed as one of the most influential statements on open access in the world. This statement was formulated in 2003 which stressed the need to make information readily and widely accessible and available to all users. The statement further calls for support for all the channels of “knowledge dissemination” both the traditional form the electronic form (Max-Planck-Gesellschaft, 2017).

In addition to BOAI and the Berlin Declaration, there are various other open access mandates that are directed to researchers in certain academic fields. They include the Bethesda statement in 2003 (Chemistry), Declaration on Free Access to Law in 2002 (Law), UNESCO Salvador Declaration on Open Access (2005), and Durham Statement on Open Access to Legal Scholarship in 2008 (Law).

Currently, there is a worldwide proliferation of institutional repositories as indicated by figures from OpenDOAR all operating based on the fundamental principles of open access which were formed from the Budapest Open Access Initiative. From an initial figure of 88 institutional repositories in 2005 OpenDOAR, a directory of open access repositories now lists 4124 institutional repositories spread across the globe as at April 2019 (OpenDOAR, 2014). The total number for Africa is 202 which is 4.8% of the total number of IRs in the world.

Kakai(2018) posits that institutional repositories have the ability to solve the problem of lost grey literature in universities and research institutions. The author attributes the rapid growth of IRs to the availability of free online preservation avenues and the adoption of protocols that allow IRs to be able to receive and send information to other search engines. .

Although the worldwide distribution of institutional repositories from the above shows that institutions in Africa are lagging behind their counterparts elsewhere, Hammes and Olivier (2009) as cited in Bangani (2018) report that African universities were part of the picture as they joined in the digital revolution with the adoption of institutional repositories right from the initial stages in the early 2000s. An example of such a university in Africa is the University of Pretoria which is said to be among the first batch of universities in the world to adopt an institutional repository. Then the Solusi University in Zimbabwe also adopted an institutional repository in 2001. The Ahmadu Bello University in Nigeria also joined the digital revolution in 2005 through the establishment of an institutional repository.

2.4 Development of Institutional Repositories in Ghana

According to Corleley (2011) the first institutional repository to be setup in Ghana was the institutional repository of the Kwame Nkrumah University of Science and Technology (KNUST) in 2008. Corleley reports further that within a period of six months the KNUST was ranked 52nd on the webometrics ranking for 100 best universities in Africa. The success story at KNUST convinced the Consortium of Academic and Research Libraries in Ghana (CARLIGH) and the International Network for the Availability of Scientific Publication (INASP) to assist four academic institutions to also implement institutional repositories. Then with the support of KNUST the University for Development Studies (UDS) also setup an institutional repository in March 2014 which commenced full operation in May the same year. IRs currently working in Ghana are: KNUST, University of Ghana, University of Education, Winneba, University for Development Studies, University of Cape Coast, Presbyterian University College, Ashesi University, University of Mines and Technology, Council for Scientific and Industrial Research, and the Regional Maritime University (CARLIGH, 2019). CARLIGH also list the following IRs in Ghana as not functioning: Central University, Wisconsin International University College, Ghana Institute of Management and Public Administration (GIMPA), University of Health and Allied Sciences (UHAS), and the Methodist University College.

2.5 Open Access

The concept of Open Access was muted by the Budapest Open Access Initiative (BOAI) to advocate for users of information to be given free access without any form of barrier, to literature as long as they have access to the internet. BOAI at the end of conference in 2000 issued a statement in which they defined Open Access as:

By "open access" to this [research] literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution and the only role for copyright in this domain should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.”

BOAI advocated for the adoption of combined and sustainable strategies for the implementation of OA and this has been embraced widely across the globe and across the various disciplines. In line with this, there have been various additional open access declarations and statements by a number of groups that gave scholars a clearer understanding of the concept of open access. Examples include the Bethesda Statement, and the Berlin Declaration.

According to Alemna (2016) these statements issued from the conferences in Budapest, Bethesda and Berlin in the early 2000s helped to give scholars a clear understanding of the concept of Open Access.

Suber (2010) defines Open-access (OA) as literature that is “digital, online, free of charge, and free of most copyright and licensing restrictions.” According to the author without the internet Open Access would not have been possible.

Alemna (2016) gives further clarification about Open Access by providing a list of certain practices which cannot be considered as open access.

1. Open Access is not self-publishing.
2. Open Access is not a means of bypassing peer review procedures for formal publishing.
3. Open Access is not an inferior class publishing avenue.

From the foregoing it is clear that Open Access also places emphasis not just on users having free access to literature but also on peer review to ensure that users have access to quality literature. This is asserted to by Suber (2010) in the author's definition of Open access (OA) scholarly literature as made up of copies of peer-reviewed documents which are without are on the internet accessible without any "licensing restriction on their use". OA movement advocates for the free accessibility to peer reviewed literature and this are insisted upon by all the major OA initiatives for scientific and scholarly literature. There is therefore some element of cost in the production of OA literature but most of the journal editors and referees participating in OA donate their labour (Suber, 2010).

2. 5. 1 Open Access Journals

Open Access journals unlike open access repositories perform peer review before making the approved contents freely available to the world. The cost of peer review, manuscript preparation, and server space are often borne by sponsors who are interested in disseminating the content, so that there are no restrictions or cost as long the user has the appropriate tools. Sometimes this means that journals have a subsidy from the hosting university or professional society. Sometimes it means that journals charge a processing fee on accepted articles, to be paid by the author or the author's sponsor (employer, funding agencies).

2.5.2 Open Access Archives/Repositories

Open Archives or repositories do not perform peer review, but simply make their contents freely available to the world (Suber 2010). They may contain preprints which have not been refereed and refereed postprints, or both. Archives may belong to institutions, such as universities and laboratories, in that case are known as institutional repositories, or disciplines, such as physics and economics.

Open Access Archives also allow authors to archive their preprints without anyone else's permission. Majority of the journals allow authors to preserve their postprints. However, an archive must comply with the metadata harvesting protocol of the Open Archives Initiative to be interoperable so that users can find their contents worldwide.

2.6 Awareness and Contribution by Faculty Members

Institutional Repositories often contain the works of faculty members, researchers and students of an institution. This is so despite the fact that a large part of the content is often the contribution of faculty members. According to Abrizah(2010) the contribution of faculty members of a university usually forms the foundation upon which an institutional repository is built.

The content of an institutional repository is the most important part of the repository; as such its growth is key to the very existence of the repository. The content must therefore be given all the attention it deserves otherwise the institutional repository risks extinction. It is the content of an IR that researchers and students search and make reference to that gives visibility to both the

institution and the faculty. Thompson, Akeriwe and Aikins (2016) assert that a repository whose content remains static will cease to exist in no time. It is therefore not surprising that academic libraries, librarians and scholars are looking for efficient strategies of recruiting content for their IR collections.

The available literature indicates that institutional repositories face a major challenge of less contribution from authors. It has been argued that although faculty form the majority of the authors of the content of institutional repositories a large number of faculty are not inclined towards contributing to institutional repositories. The lack of a positive attitude has engaged the attention of scholars over the years because the performance of an institutional repository is dependent on the content which in most cases is the contributions of the faculty. The issue of low deposits or less content recruitment has therefore received a lot of attention from scholars worldwide.

Basically, the content of institutional repositories is built through self-archiving, mediated archiving and digitization. Self-archiving is the process whereby the authors or contributors submit or deposit their own items into the repository by themselves whereas mediated archiving is done by IR staff where items are collected from authors and deposited by the staff. Mediated archiving is labour-intensive and requires higher staff numbers to achieve desired results. Ideally, all institutional repositories ultimately aim at self-archiving but this is increasingly challenging because getting depositors to commit to regular self-archiving is problematic.

In a study of the institutional repositories and open access awareness among the researchers of the University of Calicut, Manchu and Vasudevan (2018) discovered that the majority of researchers in the university were aware of the concept of institutional repositories and saw it as an avenue to

improve their scholarly activities. However, they were constrained by how to archive their work in the repository, while some of them thought that publishing in an institutional repository did not give them the level of prestige they needed. The study suggested that the library should educate researchers about the benefits of institutional repositories and also encourage them to populate the repository.

Mnzava, and Chirwa, (2018) studied the utilization of the Institutional Repository of the Sokoine University of Agriculture Institutional Repository (SUAIR) by the faculty members at the College of Veterinary Medicine and Biomedical Science (CVBMS) in Tanzania. The study examined the level of awareness, attitude, self-archive and the challenges facing the faculty members in using SUAIR and finds that although SUAIR was promoted through a number of sources like the internet and other forums, the repository had low deposits because of the low rate of self-archiving, the busy schedule of faculty members and the fear of plagiarism. This was happening despite the positive attitude the respondents had towards the use of SUAIR.

A study by Okoroma (2018) on the perception and behaviour of faculty members towards institutional repositories in academic libraries in Nigeria notes that most of the faculty members in Nigeria are either not conversant with the concept of institutional repositories or are not well informed about the aims and objectives of IR, and therefore not inclined to present their work. The author therefore recommends that faculty members are properly educated on the programmes of the IR and on issues of copyright.

Narayan and Luca (2017) examined the factors that encourage or discourage the participation of faculty members in self-archiving and discovered that the level of awareness and the preparedness to deposit documents on the IR had a positive relationship.

The relationship between the level of awareness and the level of faculty members' contribution is further demonstrated in a study by Moseti (2016) who studied the archiving of research documents in universities in Kenya and finds that faculty members at universities have individually been involved in archiving their electronic works although they seldom did that through the institutional repository. This has been largely attributed to the lack of awareness of the important role of digital repositories in digital preservation. The need for IRs to educate faculty members on the purpose and benefits of IRs was further emphasized by the study.

Mammo and Ngulube (2015) in a study conducted at some selected universities in Ethiopia on the attitudes of academics toward open access journals discovered that the majority of the academics were aware of open access journals, had positive attitude towards open access journals and were willing to use them. The study also reports that the academics were actually using open access journals.

Bamigbola (2014) examined the level of awareness, attitude to use of institutional repositories and challenges faced by faculty in Agriculture disciplines in Federal University of Technology, Akure, (FUTA), Nigeria. The study found that the level of awareness of IRs by faculty members was increasing even though there was a variation in the level of awareness across the various disciplines. In addition, the study reports that although there was a general positive attitude towards the IR, there was low submission of scholarly works by faculty.

Manchu and Vasudevan (2018) examined institutional repositories and open access publishing awareness among the researchers in the University of Calicut and report that while the majority of researchers in the university were aware of the concept of institutional repositories and saw it as an avenue to improve their scholarly activities they were constrained by how to upload their work in the repository, while some of them thought that publishing in an institutional repository did not give them the level of prestige they needed. The study suggested that the library should educate researchers about the benefits of institutional repositories also encourage them to populate the repository.

Dlamini and Snyman (2017) in a study of institutional repositories across Africa conclude that “the lack of awareness of Open Access Institutional Repositories (OAIRs) is not peculiar to one country in Africa but is seen in the whole continent of Africa”.

In order to overcome the challenge of low submission rate some scholars have examined self-archiving as against mediated archiving to determine which of the two would help institutional repositories overcome the challenge. Among these scholars are Kyriaki-Manessi et al. (2013), who studied the attitude of faculty members and their self-archiving behaviour towards the IR and discovered that faculty members were willing to deposit their work in an IR and were prepared to learn self-archiving.

In a study conducted by Oguz and Assefa (2014) on the factors that hinder or enable faculty members to do self-archiving the authors discovered that the perception of faculty members and

their willingness to deposit their documents on the IR had a correlation with their research productivity rather than just the awareness and experience.

Ammarukleart(2017) in a study of factors affecting faculty acceptance and use of institutional repositories in Thailand finds that faculty members preferred an easy submission process that was also less time consuming.

Tapfuma (2017) examined the utilization of institutional repositories in public universities in Zimbabwe and finds that majority of those who deposited their works with the institutional repositories had someone to upload it for them (mediated archiving) and that only a few of them uploaded their documents themselves (self-archiving).

Some other scholars like Casey (2012) have attributed the low level of contribution by faculty members to the absence of mandatory requirements and the general lack of institutional policies on institutional repositories. The lack of motivation and recognition for faculty members and researchers who publish on the institutional repository were also identified by Casey as factors that discourage faculty members from contributing to the institutional

In a study conducted by Singeh et al. (2013) to examine the attitude of authors towards self-archiving in Institutional repositories in Malaysia the authors found that the performance expectancy, effort expectancy, social influence and facilitating condition did not influence authors' behavioral intention to self-archive. In addition, the study discovered that though faculty members see institutional repositories as a platform for disseminating information and use them frequently, most of them have not fully embraced self-archiving in institutional repositories.

2.7 Use of Institutional Repositories for Teaching

Faculty members are often faced with the challenge of how to store their research output and make this available to their students and other scholars within and outside the institution. Lynch (2003) has defined an IR as “a set of services 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.” Key among these services are preservation and metadata services which ensures that the research output of members of faculty are stored and made accessible to students and other scholars globally. An institutional repository provides a system that captures and preserves teaching and learning materials of an institution. By providing access to teaching and learning materials across institutions students and teachers can access lots of learning and teaching materials available across the institutions and they can develop themselves accordingly.

At the tertiary level of education institutional repositories provide access to teaching and learning materials to both teachers and students to improve the quality of teaching and learning in these institutions. By making these materials accessible the institutional repository will enable teachers and students to pursue their academic goals.

Tmava and Miksa (2017) in a study of the factors affecting faculty participation in institutional repositories using the theory of planned behavior and the model of factors affecting faculty self-archiving the authors discovered that majority of the faculty members were prepared to participate in an OA IR. Difficulty with the submission process was seen as a hindrance to the participation of faculty in institutional repositories. The study also concludes that even though faculty regarded institutional repositories as low quality Publishing Avenue they recognize the importance of IR in disseminating their work to a global audience.

It is generally accepted that to ensure high quality of teaching and learning activities in an institution there is the need to make learning and teaching materials widely accessible to teachers and students within and outside the institution. This would enable teachers and students to have access to more information that would broaden their knowledge and understanding on any specific subjects.

Okoroma (2018) conducted a survey of the utilization of institutional repositories (IRs) of five Nigerian universities in terms of self-archiving, preservation of research articles and for searching information resources and found that the IRs faced the problem of low submission of documents. The study also found that although utilization of the IR was high faculty members were reluctant to submit their works. The authors therefore suggested the need for education and awareness among faculty members on the importance and use of the IR.

2.7.1 Use of Institutional Repositories for Learning

The high cost of quality study materials is one of the prominent barriers to accessing affordable and quality higher education. This informed the decision of the Budapest Open Access Initiative (BOAI) to launch the open Access movement in 2001 to ensure that users have access to free literature on the public internet which allows users to read, download, copy, distribute and print, such literature without financial or legal barriers. Suber (2010) opines that the only barrier on reproduction and distribution of the information is that the user of the information must acknowledge authors and cite them.

Students have been known to use the institutional repository to search for thesis and dissertations most often when they are carrying out research for their thesis. This is an important role that the institutional repository plays to facilitate learning and research in an institution. In a study of the role of research students in an institutional repository at the Loughborough University Pickton and Mcknight (2006) finds that students were more interested in having access to complete theses, postprints and conference papers.

Institutional repositories by sharing the research output of the institution with the outside world provides an avenue for collaboration with other institutions in research to strengthen the research capacity and improve the quality of the higher education institutions. By making accessible the research works of the institutions faculty and students get to know each other's research works and can therefore take initiative for future collaborative project with other institutions (Anenene, Alegbeleye, and Oyewole, 2017).

2.7.2 Use of Institutional Repository for Research

Available literature point to the fact that institutional repositories have been used to facilitate research globally and in developing countries including Ghana. According to Cassela (2010) institutional repositories “are intended to be a showcase for the research output of an academic or research institution.” For the individual researchers, the establishment of a centralized platform for research findings which is made available via open access and interoperable IRs improves the visibility and impact of researchers.

Faculty members and the research staff through the use of the IR have access to a wide range of research articles without any hindrance and cost. At the same time their works are disseminated to

a wider audience of researchers which increases the impact of researchers' work. (Dhanavandan & Tamizhchelvan, 2013). This implies that apart from universities, faculty members and other contributors to the institutional repository have a lot to gain.

Owusu - Ansah et al. (2017) investigated the role of university libraries in supporting research output in the University of Ghana. Faculty and postgraduates within the University of Ghana (UG) were sampled and examined on the role of the university library in promoting research. The authors report that there was a significant positive relationship between the status of respondents and promoting research output. That is to say, promoting reference tools, advocating strongly for open access among researchers, organising conferences to share research findings and promoting research output via social media is likely to be affected by the status of the respondent that is whether the person is a faculty member or postgraduate student. In other words, one being a faculty or post-graduate student could influence how research output would be promoted. However the authors did not find any significant relationship between the status of respondents and the facilities, skills offered them by the library. Thus, users of university libraries are equipped in terms of facilities, skills and knowledge, regardless of their status (being a faculty member or post-graduate student). It may be generally observed that the status of respondents has a significant positive relationship with provision of services by university libraries and promotion of research output.

Martin-Yeboah et al. (2018) in a study of some selected institutions in Ghana concludes that the institutional repositories exist to project the university's image in the global space, with research productivity being the main driving force.

Cullen and Chawner (2010) assessed the development of institutional repositories in New Zealand and explored the factors affecting the adoption and success of institutional repositories from the perspective of the library managers and from the perspective of the academic community. The authors evaluated the performance of the institutional repositories against some indicators such as the purpose and scope of the repositories, implementation and marketing of the repositories and the attitudes and perception of academics to institutional repositories and how this will impact on their use of repositories for the dissemination of their own research.

In a study of the relationship between impact factor websites of institutional repositories and the quality score of the Performance Based Research Fund (PBRF) Li (2011) discovered that there is no significant relationship between the IR website impact factor and PBRF quality score and therefore concludes that the page ranking did not measure the quality of a document on an IR.

Wacha and Wisner (2011) in a study of institutional repositories at American colleges and universities assessed the quality of the contents of the repositories through citation indexing in order to identify articles and authors of highest impact of an institution.

Shajitha and Abdul Majeed (2018) examined the rate and nature of content growth of institutional repositories in South India and discovered that the overall growth rate was slow and the institutional repositories tended to become inactive after some period of their establishment.

Ammarukleart (2017) applied the unified theory of acceptance and use of technology (UTAUT) model to examine faculty members' self-archiving behavior and to investigate factors affecting

faculty acceptance and use of university-based institutional repositories in Thailand. The results of the study confirm that the success of university-based institutional repositories depends not on a single factor but on multiple factors such as performance expectancy, social influence, resistance to change and the intention of members of faculty to use institutional repository.

Similarly, Boufarss (2011) in a study of the attitudes of faculty members towards institutional repository discovers that the majority of faculty members were willing to contribute to the institutional repository even though they were not familiar with self-archiving.

Creaser et al (2010) examined the awareness of academics towards open access institutional repositories and what influences users to utilize institutional repositories and notes that the participation of faculty members is very low due to issues like fear of plagiarism, lack of technical skills and confusion with copy right.

Kim(2007)using a conceptual model of the factors based on the Socio-Technical Network Model and Social Exchange Theory investigated factors that encourage or hinder the contribution of faculty to institutional repository. The study reveals that faculty members who were prepared to contribute to the IR indicated that the IR provided more accessibility and publicity of open access materials.

The issue of availability and accessibility of the content of institutional repositories was investigated by Lee, et al. (2015) at institutional repository of Florida State University. The authors conducted independent known item title searches on both Google and Google Scholar (GS) to search for faculty publications housed in the IR of the university and concluded that the

contribution of the institutional repository in making articles available and accessible was very high even though impediments linked to contractual arrangements between authors and publishers, policies, practices and technologies governing the repository itself, and the low deposits were impediments.

Armstrong (2014) examined the various management models that institutional repositories can adopt to accomplish their primary objective of research dissemination and found that while librarians see faculty scholarship as an organizational resource to be managed, faculty sees their research output in terms of achievements and contributions that will result in further securing their appointment, career development, and academic freedom. The author suggests that librarians put in strategies to bridge this values gap in order to get institutional repositories to flourish and used to its maximum capacity.

One of the factors that hinder contribution by faculty members is the issue of copyright. Faculty members in a bid to get their articles published may lose the copyright of their works to publishers and this may cause them to be reluctant to deposit their articles on the IR. This has prompted some researchers to advocate for the intervention of institutional repositories to seek for permission to archive documents in accordance with copyright and contractual agreements. One of the services offered by the IR offers is therefore to seek for permission from copyright owners before the materials authored by faculty members are archived. Tripathi and Jeevan (2011) advocate that authors are well informed about intellectual property rights to ensure that IR services and contributors do not fall foul of the law.

A study by Tiemo & Ebiagbe, (2016) on the awareness and attitude of faculty members toward the establishment of institutional repository (IR) in Niger Delta University, Nigeria found that although awareness of institutional repository was high and that majority of the faculty members agreed that if the repository was established in the university it will enable them to deposit their documents they thought that this will violate the copy right law. However, the study also reveals that most of respondents agreed that university management makes it mandatory for research outcomes to be submitted to the IR. The authors therefore recommended more awareness creation of IR for faculty members especially on the dangers of giving out the copy right of their documents out to commercial publishers.

Anenene and Oyewole (2017) investigated the factors that determine the setting up of IRs in Universities in South-West Nigeria from the point of view of library staff and finds that most of the respondents (86.7%) had high level of awareness and favourable perception of IRs, however, most of the respondents also acknowledged that the issue of copyright could impede the successful establishment and usage.

Hall (2014) examined attitudes of faculty members towards institutional repositories and finds that majority of faculty members are willing to share their works in order to increase their impact. However, they will consider issues of copy right before depositing their works.

Gadd, Loddington, & Oppenheim. (2007) in a comparative study of two JISC-funded projects examined the protection of rights required by academic authors who share their search results in an open access environment as compared to the protection of rights required by the authors who share their educational materials in the same way. The study reports the lack of clarity among

researchers and teachers on copyright properties in the materials they produced. The researchers were more restrictive about the authorizations they would have allowed, but they were liberal with regard to the terms and conditions. The teachers would allow many authorizations, but based on more stringent terms and conditions. The study concludes that it was not possible to use one single solution for individual rights for both researchers and teachers.

2.8 Benefits of Institutional Repository

The global adoption and implementation of institutional repositories by universities and research institutions can be attributed to the number of benefits these institutions stand to gain. According to Kaur (2017) an institutional repository is an effective and efficient way to archive and make documents accessible to authorized users.

The first benefit of an institutional repository to the institution is that by putting together the research output of the university on one platform and making it accessible online to all those who need it the IR gives the institution global visibility and therefore enhances its value and prestige.

By making the teaching, research and scholarship output of an institution accessible to users all over the world the IR helps to increase the visibility and prestige of the institution. By exposing the metadata of its content to metadata harvesters other researchers are able cite the faculty which gives them visibility. An IR provides a centralized digital showcase through which community members can highlight their work. Through an IR, prospective students and faculty can obtain a robust picture of the types and areas of scholarship in progress in a given department.

Digital scholarship which would have ended up on the hard drive of a person's computer is now being made widely available to a global audience who will read and cite it because it was deposited into an IR. Hixson and Cracknell (2007) noted that, when research engine returns search results that lead to the faculty and institution, it can raise the profile of both the faculty authors and the institution. The faculty can thus benefit by depositing their copyright- owned material in the institutional repository as it will give them personal visibility for research works as well as help in their career development. The institutional repository system increases access to materials that would otherwise be difficult to obtain and provide leads to related electronic resource and databases.

Mensah (2015) asserts that storage of electronic collections is a major duty of institutional repositories to ensure the preservation of the digital intellectual output of the institution. In a qualitative study of the institutional repositories of public university libraries in Ghana the author finds that although the universities had established institutional repositories to capture and maintain digital collections, existing digital preservation methods and systems were inadequate and could lead to consequences such as denial of access to their digital collections or total loss of information. Mensah (2015) therefore recommends the development of comprehensive digital preservation policies to provide mandate and direction to preservation of the digital collections in libraries.

IR also ensures faculty members and other members of the university community have access to research articles without necessarily pay any subscription and also without seeking for permissions from publishers.

IR also eliminates the need to trust publishers to preserve information for a long term, without any financial gain to the authors. Institutional repositories therefore ensures that information is disseminated to a wider audience.

2.9 General Utilization of Institutional Repositories

Apart from the specific uses of IR for teaching, learning and research IRs are also use to capture and preserve all digital documents of enduring value that the members of the institution produce. When this is done the responsibility of the care and preservation of a digital document, which hitherto rests on the author of the document, now becomes the responsibility of the IR. The responsibility of stewardship will shift from the individual's level to the institution's level so that documents which were previously stored by their authors on a computer's hard drive and therefore become inaccessible or were completely lost to other users were now captured and made accessible to all who need it.

Institutional Repositories assist in standardization of institutional records. The compilation of an institutional and individual online dossiers linked to the full text of articles become possible. IR supports for learning and teaching. Links may be made with the virtual teaching environment and library catalogues.

Institutional Repositories have adopted some services in order to overcome the challenge of low submission rate. Staff of the IR search the various academic social networking websites, to find articles authored by faculty members and which can be archived is also an import service offered

by institutional repositories. Although information communication technology has permeated almost every aspect of life not all materials that need to be archived are in digital form. Scanning print materials in order to archive them is therefore one of the essential services offered by institutional repositories. Each institutional repository provides an IR specific professional layout for articles in order to ensure consistency of IR items. Institutional repositories also provide metadata which gives a good description for the items archived. The IR should inform faculty about how much their work is accessed at least on a monthly basis. Usage Reporting gives them feedback on how much their work is being consulted. Faculty profile page – Provide automated faculty profile page including selected works, summary of research, profile, etc. This gives them visibility and allows them to forward requests for documents to a single place

2.10 Chapter Summary

The literature review dealt extensively with issues that guided the study. The views of various scholars, authors and authorities regarding institutional repositories were discussed. A historical view of the beginning of institutional repositories and its worldwide acceptance were discussed. The use of institutional repositories in facilitating teaching, the use of institutional repositories in facilitating learning and the use of the institutional repository in research were looked at. Studies which were conducted to investigate the attitude of faculty towards contributing to the IR were also discussed. The benefits of IR and the challenges were also discussed. The review reveals the problem of low contribution to institutional repositories as a global phenomenon and this can be attributed to the lack of awareness of users and contributors of institutional repositories. The lack of a clear understanding of copy right issues, the absence of rewards and incentives for contributors to the institutional repositories and the lack of mandatory deposits were also mentioned as the factors that hinder the full utilization of IRS.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter focuses on the methodology employed in the study. The term methodology has been interpreted and, therefore, applied variously by different authors and researchers alike. In the current investigation underway, an attempt has been made to conceptualize the term methodology by first looking at what other authors have interpreted it to mean. Babbie (2013) is of the view that methodology which is a sub-field of epistemology can be defined as “*the science of finding out; procedures for scientific investigation*”. Finally, Kothari (2014) defines research methodology as the systematic approach to solving a research problem.

In all the above definitions of the term methodology, what stands out clearly is the fact that every methodology adopted in a research investigation must be borne out of a research philosophy and theory and that it encapsulates assumptions, principles and justifications of specific procedures, methods, approaches, tools and techniques applied in the research thus making it broader than each of the above mentioned units of methodology. What has emerged further is the fact that in developing a methodology, the researcher must keep in mind the research problem under investigation.

Sub-headings considered under the methodology in this chapter include research design, selection of cases and selection of subjects, data collection instruments and data presentation and analysis.

3.2 Research Design

Research design is always driven either consciously or unconsciously by one research philosophy or another. This particular research is underpinned by the pragmatic research philosophy, which integrates both qualitative and quantitative research approaches in its design (Creswell, 2009). Kumar (2011) posits that one critical tenet of the pragmatics worldview is pluralism which allows for reliance of the researcher on a multiplicity of methods, procedures, tools and techniques, which Creswell and Kumar indicate will lead to findings that will be holistic.

Bryman (2012) outlines various types of research design which include the case study design, and cross-sectional survey design. The rest are experimental design, longitudinal survey design(s), and comparative design. Creswell (2009) goes further to suggest that to operationalize a particular research design demands a selection of one from among three research approaches. It can be a purely qualitative, purely quantitative or a mixed methods approach.

In this particular study, a case study design was employed with mixed methods approach was applied to the institutional repository and the users which aimed at an in-depth examination of the impact of the IR on teaching and research by faculty members and learning and research by graduate students of the University for Development Studies (Bryman, 2012; Creswell, 2009). Creswell (2009) states that mixed methods research approach goes beyond just indicating that the research adopts qualitative and quantitative approaches to actually integrating the methods and tools and indicating the proportions of each from instrumentation, data collection, analysis and interpretation of findings.

Quantitative research refers to the use of figures, statistics and other mathematical data in the systematic examination of social phenomena. According to Mugenda & Mugenda (2017) quantitative research often taken in order to develop and employ mathematical models, theories and hypotheses pertaining to phenomena. Quantitative research relies on the use of measurement to be able to provide the fundamental link between reality and the mathematical expression of the quantitative relationships. Under this investigation, the quantitative data that was collected and analysed was made up of survey data from faculty members and graduate students of the University for Development Studies (UDS).

Qualitative research, on the other hand, has to do with non-probability sampling procedures which are concerned with in-depth data rather than representativeness, open-ended data collection, textual and pictorial analysis, and the presentation of information in tables and figures (Creswell, 2009). In this study, the qualitative data that were collected and analysed include interviews with the

University Librarian, the head and two staff assigned to the IR, 4 campus representatives of the IR and the head of Technical Services Unit of the UDS Library.

The use of both qualitative and quantitative approaches was because the qualitative approach allowed the researcher to investigate the staff of the UDS Space in order to obtain in-depth data about the various challenges that the various subjects face in their attempt to patronize and/or manage the IR services which are purely experiential while the quantitative approach allowed the researcher to study faculty members and students. This guided the researcher in the formulation of research questions employed to test the impact of IR on teaching and research by faculty members and study and research by students.

3.3 Selection of Subjects

The major depositors and users of the IR are the faculty members and graduate students of the university. These two group of people were selected for the study. The service providers in the IR department which include the campus representatives, head of Technical Services Unit, staff and head of IR Unit as well as the University Librarian were also studied.

The faculty members and graduate students were deemed very important group of subjects for the study because they possess more potential of using the IR resources and also the fact that there is less diversity at that level.

The study thus engaged all the service providers which include the campus representatives, the head of IR, head of Technical Services Unit and the University Librarian because of their activities and responsibilities as service providers and managers of the IR, and hence the need for the researcher to acquire more detailed information from them.

3.4.1 Population

Kothari and Garg (2014) define population or universe as all the items in any field of inquiry and indicated that the concept goes beyond human subjects to include documents, artifacts, activities or social actions, archival records and physical artifacts. Regarding this study, the total population was nine hundred and eighty - eight (988) which comprises the faculty members, the graduate students, and the managers of the institutional repository (IR) of the University for Development Studies (UDS). The managers of the IR include four (4) campus representatives, two (2) supporting staff at the IR unit, head of IR, head of Technical Services Unit, and the University Librarian.

Table 3.1: Population Distribution

Campus	Faculty Members	Total Graduate Students	Total Population
Tamale Campus	181	102	283
Nyankpala Campus	176	43	219
Navrongo	110	15	125
Wa Campus	166	186	352
Sub-Total	633	346	979

IR Managers			9
Total			988

Source: Field Data, 2019

3.4.2 Selection of Sample

A sample size is a selected subset of the subjects of the population under investigation. Neuman (2006) states that in a population less one thousand, a sample ratio of 30 percent is appropriate. In this regard, the researcher used 30 percent of the population of faculty members and graduate students to undertake the study since the total population (988) of these categories of people was less than one thousand (1000). Thirty percent from the population of faculty members was estimated at one hundred and ninety (190), while 30 percent of graduate students was estimated at one hundred and four (104). All the nine IR managers were taken as part of the total population. The summation of both the sample size of faculty and graduate students estimated a total sample size for the study as two hundred and ninety-four (294). Also, service providers of the IR which include four (4) campus representatives, two (2) staff assigned to the IR unit in Nyankpala, the head of IR, the head of Technical Services Unit and the University Librarian estimated at a total of nine (9) and since the number was not much, the researcher used all the 9 staff at the IR department for the study, hence sampling was not required in the case of the service providers.

Table 3.2: Sample Size Distribution

Population Category	Total Population Size	Sample size (30%)	Total Sample Size
Faculty Members	633	$30 \times 633 / 100 = \mathbf{190}$	190
Graduate Students	346	$30 \times 346 / 100 = \mathbf{104}$	104

Sub-Total	979	$30 \times 979 / 100 = 294$	294
IR Managers	9		
Total	988		

Source: Field Data, 2019

The sample size was proportionately distributed to various campuses based on the population size of each campus. Table 3.3 below depicts a proportionate distribution of the population to various campuses.

Table 3.3: Proportionate Sample Size Determination of Faculty Members

Campus	Total Population of Faculty Members	30% of Sample Size	Total Sample Size
Tamale	181	$30 \times 181 / 100 = 54$	54
Nyankpala	176	$30 \times 176 / 100 = 53$	53
Navrongo	110	$30 \times 110 / 100 = 33$	33
Wa	166	$30 \times 166 / 100 = 50$	50
Total	633	$30 \times 633 / 100 = 190$	190

Source: Field Data, 2019

In the same vein, 30 percent of the total population of 346 Graduate Students was used as sample size and distributed proportionately to ensure that the campuses were equally represented. Table 3.4 below shows a 30 percent representation of the campuses.

Table 3.4: Proportionate Sample Size Determination of Graduate Students

Campus	Total Population of Graduate Students	30% of Sample Size	Total Sample Size
Tamale	102	$30 \times 102 / 100 = 31$	31
Nyankpala	43	$30 \times 43 / 100 = 13$	13
Navrongo	15	$30 \times 15 / 100 = 4$	4
Wa	186	$30 \times 186 / 100 = 56$	56
Total	346	$30 \times 346 / 100 = 104$	104

Source: Field Data, 2019

Convenient and purposive sampling methods were used in the data collection process. The researcher distributed the questionnaire to the students in lecture halls while the questionnaire for faculty members were distributed to them in their offices until the sample size was attained. This exercise was undertaken in between March and April 2019.

3.5 Instrumentation

Questionnaire and interview guides were the main data collection tools used in this study. In the spirit of the mixed methods approach being adopted, the questionnaire contained only close-ended

questions which helped in gathering quantitative data from the faculty and graduate students while interviews were used to collect qualitative data from service providers.

3.5.1 Questionnaires

According to Babbie (2010), a questionnaire can be described as a document containing questions designed to elicit information appropriate for analysis. Ganga and Maphalata (2015) have also described questionnaire as *“a form of enquiry that contains systematically arranged series of questions that are given to research participant to elicit data for study.”* In order to collect data for this study, the researcher designed questionnaires for the faculty members and graduate students. The questionnaires were divided into sections and guided by the objectives of the study.

Section A contained questions on the demographic characteristics of the respondents. Section B focused on seeking data on the level of submission of documents to the IR by the respondents. Section C sought data on the purpose for using the IR whilst Section D asked for responses on the benefits of the IR to users. Sections E and F focused on the challenges confronting IR users and suggestions on measures to resolve those challenges.

The questionnaire for the students was equally divided in to sections. Section A, demographic data, Section B, level of awareness, Section C, purpose of using the IR, Section D, benefits, Section E, challenges, and then Section, F measures to resolve the challenges.

3.5.2 Interviews

The study employed the use of semi - structured interview to assist the researcher to investigate the service providers of the IR where the university librarian, the head of IR, head of Technical Service Unit, staff of the IR, and the campus representatives of the IR were interviewed. This aspect of the investigation was to help the researcher get a clear understanding of workings of the IR and the factors that inhibit or facilitate submission of documents to the IR and the usage of the IR by both faculty member and students. There were four different interview guides developed for the four categories of respondents. The interview guide was for the university librarian, the second was for the head of the IR, the third for the head of technical services Unit, and the third was for the staff and campus representatives of the IR. These can be seen in the Appendix. The interview guides were developed with the objectives of the study in mind. Some of the questions were borrowed from Hall (2014) and Ammarukleart (2017) and modified to suite the current study.

3.5.2 Pre-Testing of the Instruments

The instruments for the collection of data were pretested to ensure that the results obtained are reliable and valid. Although reliability and validity are sometimes used to mean the same thing, the two concepts have different meanings in research. If the results of a number of tests using a certain procedure gives the same results then the instrument could be said be reliable. Reliability implies that a repetition of a test would give one the same results. However, a defect with the instrument would also give one the same result no matter the number of times the test is conducted. Reliability implies the ability of the test to be conducted in a similar manner and the results obtained to be repeatable. The validity of an instrument is the ability of the instrument to measure what it should measure. A test is valid if it measures what it should. Every valid test is reliable, but not every

reliable is valid. For example, if you incorrectly set the clock five minutes late. Each time you read the time, the watch will show the time that is reliable but five minutes late which is not valid.

Neuman (2006) defines validity as the level of accuracy of the results of a study or a test. The degree to which tests results accurately reflects what has been used to measure. According to the author validity is the extent to which an investigation reflects what has been measured. In order to eliminate or reduce to the barest minimum the element of bias that could emerge from the study, a structured questionnaire and an interview guide were designed for the study.

To make sure that the instrument for data collection was appropriate a pre-test was conducted on the some selected faculty members and graduate students on the Tamale and Nyankpala campuses of the UDS. Checks were made on the questionnaire to determine the level of appropriateness and relevance of the questions in the instrument. This early draft was piloted on ten selected lecturers and graduate students on the Tamale and Nyankpala Campuses, five on each campus. Based on the feedback from these respondents, several modifications were made. Colleagues in the UDS Library and other academic staff of the university were also consulted on the questionnaire before the final version of the questionnaire was then distributed.

Some ambiguities and jargons were taken out of the questionnaire to make the questions clear and easy to understand. For example, a lecturer suggested the use “Campus” since research was based on the campuses of the university.

According to Neuman (2006) reliability in research refers to how consistent or dependable a given measurement technique is. Reliability implies that a given measurement technique would produce the same results, similar findings or the same description of the phenomenon. One of the means by which the researcher guaranteed reliability was the strategy used in the selection of the instrument together with the planning and management of the questionnaire. The preliminary test also helped to verify the reliability of the articles in the questionnaire and to request the permission of the respondents for the administration of the questionnaire.

Reliability also refers to the extent to which any measurement procedure produces the same results on repeated tests. The more consistent the results obtained by the same participants in the same repeated measurements, the greater the reliability of the measurement procedures. Alternatively, the lower the consistency of the results, the lower the reliability.

The consistency of the results obtained by conducting the same tests with the same participants determines the reliability of the measuring procedures. This implies that if the results obtained from repeated tests lacks consistency the lower will be the reliability of such measuring procedure. In order to achieve reliability of the measuring procedures the researcher must conduct the tests repeatedly until research tools and procedures yield consistent measurements. To this end therefore, the test-retest method of reliability was adopted and all the constructs in this study went within acceptable range.

3.5.3. Data Collection Procedure

Data collection procedure refers to the ways and means by which a researcher obtains relevant information regarding the major ideas of the hypothesis of the study so he can demonstrate whether or not the hypothesis can be verified (Alreck&Seattle, 1985; Descombe, 1989). What the researcher uses to collect data is known as the instrument.

For the quantitative data collection, simple random sampling methods were adopted. In the he first stage the four campuses of the UDS thus; Tamale, Nyankpala, Navrongo and Wa campuses were considered as clusters which were all investigated. The second stage then had to do with selection of the various respondents for the questionnaire. The questionnaire was administered to any of the students in lecture halls until the required number was met and faculty members were contacted in their offices. Since the respondents are all lettered, the questionnaires were simply hand-delivered to them and retrieved in person by the researcher. As a result of the data collection approach adopted, response rate for graduate students was 74.2 percent, while the rate for faculty members was 82.5 percent.

The purely qualitative data was gathered through interviews as a method using interview guides as an instrument. The interviews allowed the researcher to examine in detail and at first hand the various challenges confronting the IR in its bid to serve the university community efficiently.

For the purposes of the current study the university librarian, the head and staff of the IR, the campus representatives of the IR, and the head of Technical Services of the UDS Library were

interrogated. The interviews took the form of discussions in which the researcher introduced topics on issues and posed questions in some instances to initiate the discussions and elicit responses. Five of the interview sessions were held in Nyankpala with university librarian, the head and staff of the IR and then the head of the Technical Service Unit while three sessions were held with the three campus representatives in Tamale, Navrongo, Wa, and Nyankpala. The responses were all recorded both manually and using audio recorders with the permission of the respondents. This was to aid complement the two methods of data recording.

The interviews started with the university librarian. The recorded voice was transcribed and analyzed in line with the objectives of the current study. This was followed by the interviews with head of the IR and the head of Technical Service Unit of the Library. Again, the process of transcribing and analyzing the responses was followed before the interviews with the IR staff. The other three campus representatives were then interviewed via telephone because of the distance involved. The responses were also recorded, transcribed and analyzed.

3.6 Data Analysis

Data analysis is the process of extracting from the given data, relevant information, from which a summarized and comprehensible numeric description can be formulated. The data was analyzed using both quantitative and qualitative approaches. The quantitative data was analyzed using both the excel and SPSS version 23 out of which data analytical tools such as frequencies, and percentages were used. The qualitative data was recorded, transcribed and analyzed to identify themes. These were in the form of recorded voices of interviewees which were subjected to content analysis which purpose was to explain the qualitative data generated from the study.

The quantitative data captured the statistical details about the faculty members and graduate students while the qualitative data was captured through interviews with the managers of the institutional repository (IR). The quantitative data was analysed using the IBM Statistical Package for Social Science (IBM SPSS) version 23 while the qualitative data was first coded to ensure respondent's anonymity and then analysed using thematic analysis. The results of the quantitative data are presented first followed by the qualitative data obtained from the interviews. The results are presented using tables, charts and graphs and verbatim quotations.

3.7 Ethical Consideration

According to Creswell (2009) researchers should expect ethical issues to come up at various stages of a research and so must prepare for them. These issues could arise during data collection. The researcher should therefore respect the participants and the sites for research and ensure that the study protects the anonymity of individuals, roles, and incidents during analysis and interpretation.

In order to ensure participant confidentiality a consent form is often provided that stipulates the purpose of the research, the rights of the participant and the obligations of the researcher relating to information collected from participant. This was signed after the interview and the participant is given a copy. The researcher also employed a script that was read before an interview stating what the interview was about and extent to the information given would be processed and used. These two events provided enough trust and guarantee for the participants. The interviews were conducted in an environment of the respondent's choice, to ensure their comfort. The research also cited and acknowledged all authors whose ideas and documents were used in this study.

The researcher sent an introductory letter from the Head of the Department of Information Studies, University of Ghana, Legon to seek the permission of the Registrar of the University for Development Studies, Tamale before undertaking the study. A copy of the clearance was then

presented to the respondents on the Wa Campus, Tamale Campus, Navrongo Campus and the Nyankpala Campus of the University for Development Studies, Tamale before the commencement of the study. Also, the identity of the subjects was kept confidential and data collected used mainly for academic purposes. Besides, all sources used in the study were duly acknowledged. Finally, this study complied with the University of Ghana code of ethics for researchers.

CHAPTER FOUR

DATA ANALYSIS

4.1 Introduction

This study is an assessment of the impact of the institutional repository of the University for Development Studies (UDS) on teaching, learning and research in the university. This chapter is a presentation and description of data gathered for the study. The findings are presented under the following themes:

1. Socio- demographic analysis
2. Level of awareness of institutional repository (IR)
3. Level of contribution to institutional repository (IR)
4. Purpose of using the IR
5. Benefits of using IR
6. Challenges with the use of IR

4.2 Response Rate

As indicated in the methodology, 190 questionnaires were distributed to faculty members while 104 questionnaires were distributed to graduate students on four campuses of the university which included the Tamale Campus, Nyankpala Campus, Navrongo Campus, and the Wa Campus.

A total of 9 interviews were conducted involving the University Librarian, the head and two staff of IR, 4 IR campus representatives and the head of Technical Services Unit of the Library. Here the researcher was able to all the interviewees to avail themselves for the interviews at their own convenience.

Table 4.1 Response Rate **R**

	University Librarian	Tech. Services.	IR Staff	Faculty	Students
Sample Population	1	1	7	190	104
Response	1	1	7	141	85
Percentage	100%	100%	100%	74.2%	82.5%
Data collection Instrument	Interview	Interview	Interview	Questionnaire	Questionnaire

Table 4.2 Response Rate for Faculty Members

	Sample Population	Response	Percent
Tamale Campus	54	36	66.6
Nyankpala Campus	53	32	60.37
Navrongo Campus	33	28	88.8
Wa Campus	50	45	90
Total	190	141	

Source: Field Survey, 2019

The distribution was done according to the sub – sample of each campus. This was achieved with the assistance of colleagues based on the four campuses. Of the 190 questionnaires distributed to faculty members 54 were distributed to respondents in Tamale of which 36 questionnaires were returned, 53 questionnaires were distributed in Nyankpala out of which 32 were returned, 33 questionnaires were distributed in Navrongo of which 28 were returned, and then 50 questionnaires were distributed to respondents in Wa and 45 were returned. Tamale Campus had a response rate 66.6 percent, Nyankpala Campus had a response rate of 60.3 percent, Navrongo Campus had a response rate of 88.8 percent whilst Wa had a response rate of 90 percent. In all out of 190 questionnaires distributed 141 were returned which gives a response rate of 74.2 percent.

Table 4.3 Response Rate for Students

CAMPUS	Number of Students	Questionnaires Distributed	Questionnaires Returned	Response Rate
Tamale	102	31	26	83.8%
Nyankpala	43	13	9	69%
Navrongo	25	8	6	75%
Wa	176	56	44	78.5%
Total	346	104	85	87.1%

Source: Empirical data, 2019

In the second category 88 out of 104 questionnaires were returned by graduate students but only 85 questionnaires were found usable, yielding a response rate of 81.7 percent. Table 4.3 also shows

that 31 questionnaires were distributed in Tamale but only 26 were returned giving a response rate of 83.8 percent, 13 questionnaires were distributed in Nyankpala but only were received which gives a response rate 69 percent,8 questionnaires were distributed to students in Navrongo but only 6 were received giving a response rate of 75 percent, and then 56 questionnaires were distributed in Wa but only 44 were received giving a response rate 78.5 percent.

4.3 Quantitative Data Analysis

4.3.1 Socio-Demographic Data of Respondents

Under the first theme which concentrated on the socio-demographic analysis of the respondents data on gender and age variables were gathered. The findings on the distribution of gender and age of student respondents are illustrated in Tables 4.4 and 4.5 respectively.

Table 4.4 Gender Distribution of Faculty Members and Students

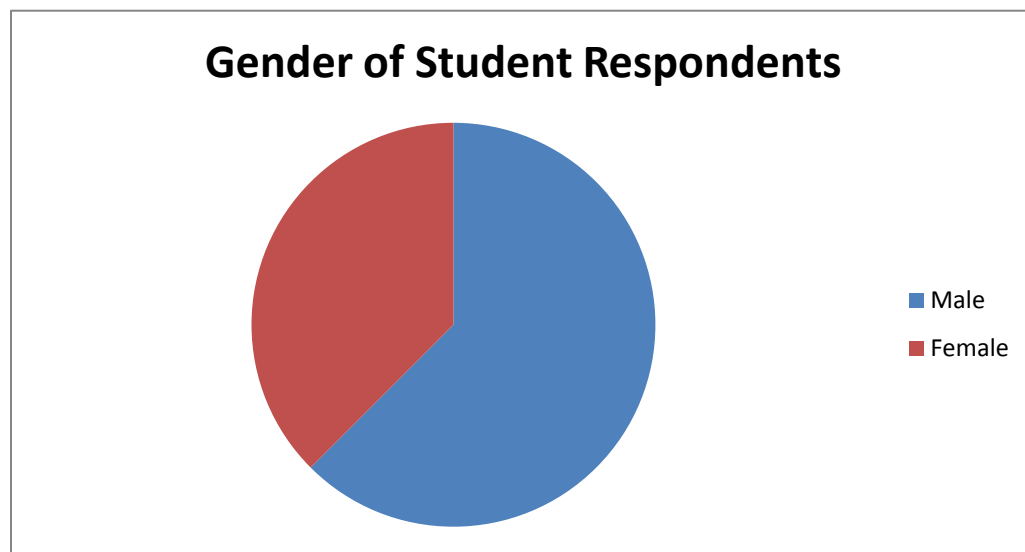
	Faculty Members (n=141)		Students(n=85)	
	Male	96	69.4%	53
Female	45	30.6%	32	37.7%
Total	141	100.0	85	100.0

Source: Field data, 2019

Table 4.4 illustrates the gender distribution of the faculty members and students. Out of 141 faculty members 96 representing 69.4 percent were males whereas 45 participants representing 30.6% were females.

Table 4.4 shows that 53 (62.3 %) of the students were male whilst 32 (37.7%) were females. For the interviewees, out of the 9 people interviewed 2 were female whilst 7 were male. The number of males was more than females.

Figure 4.1 Gender of Respondent



Source: Empirical data, 2019

Table 4.5 Age Distribution of Students

Age bracket	Frequency	Percentage
18 - 25	17	20
26 - 33	43	50.6
34 - 41	17	20
41 - 49	8	9.4
Total	85	100

Source: Empirical data, 2019

From Table 4.5 shows that the majority of the student respondents were 26 – 33 years old as 43(50.6%) of the respondents fell within this category. Seventeen respondents fell within the 18 –

25 years age group whilst another 17(20%) were within the 34 – 41 age brackets. Only 8(9.4%) respondents were between 42 – 49 age brackets.

Table 4.6 Age distribution of Faculty Members

Age brackets	Frequency	Percentage
20 - 30	11	8
31 - 40	34	24
41 - 50	68	48
51 - 60	28	20
61 - 70	0	0
Total	141	100

Source: Empirical data, 2019

It is evident from Table 4.6 that the majority (68, 48%) of the respondents were within the 41 – 50 age brackets. Thirty-four participants constituting 24 percent were between 31 – 40 years old whilst 28(20%) were between 51 – 60 years old. The respondents who fell within the 20 – 30 age brackets were 11 in number and constituted 8 percent of the respondents. There were no respondents in the 61- 70 age bracket.

4.3.2 Tenure of Service

The study assessed the length of service of faculty members with the university. This required them to indicate how long they were in the service of the university. Table 4.8 shows the findings.

Table 4.7 Tenure of Service of Faculty Members

	Frequency	Percent(%)
less than one year	3	2.0
1 - 3 years	20	14.3
4 - 7 years	46	32.7
8 - 10 years	66	46.9
10 years and above	6	4.1
Total	141	100

Source: Empirical data, 2019

A close examination of Table 4.7 shows that only 3 faculty members representing 2% served less one year, 20 respondents representing 14% served between 1 to 3 years, 46 (32.7%) served between 4 to 7 years. The table also shows that 66 faculty members representing 46.9% served between 8 and 10 years whereas only 6 academics representing 4% served 10 years and above.

4.3.3 Length of Study

Table 4.8 How long have your been studying in UDS

	Frequency	Percent
Less than 1 year	25	29.4
1 - 3 years	43	50.6
4years and above	17	20
Total	85	100.0

Source: Empirical data, 2019

The questionnaire for the student participants also sought for data on the length of period spent in the university. Out of 85 respondents 25 of them representing 29.4% were less than 1 year old in the university, followed by participants who spent 1 – 3 years in the university(43: 50.6%) and then 17 respondents representing 20% said they had spent 4 years and above in the university.

4.3.4 Rank of Faculty Members

Faculty members were also to state their rank and the results obtained has been presented in

Table 4.9 below:

Table 4.9 Rank of Faculty Members

	Frequency	Percent
Assistant lecturer	8	5.7
Lecturer	75	53.2
Senior lecturer	43	30.5
Assoc. Professor	13	9.2
Professor	2	1.4
Total	141	100.0

Source: Empirical data, 2019

From Table 4.9 it is clear that the majority (75: 53.2%) of the faculty members were of the rank of Lecturer followed by respondents of the rank of Senior Lecturer who were 43 in number

representing 30.5 percent. Eight respondents were of the rank of Assistant Lecturer representing 5.7 percent whereas 13 participants representing 9.2 percent were of the rank of Associate Professor. Only 2 of the participants representing 1.4 percent were of the rank of Professor.

4.3.5 Level of Awareness of the Existence of Institutional Repository

To achieve the objective of the present study the level of awareness of participants on the existence of the institutional repository was examined and the data are presented in Table 4.10 below:

Table 4.10. Level of Awareness of IR

	Faculty (n= 141)		Students (n = 85)	
	Freq.	Percentage	Freq.	Percentage
Yes	115	81.6	57	67
No	26	18.4	28	33
Total	141	100	100	85

The results reveals that majority of the faculty members (115) representing 81.6% were aware of the existence of the IR in the University for Development Studies (UDS) whereas 26 of them representing 18.4% said they were not aware of the existence of the IR in UDS.

In terms of the students the results indicate that 57 of the participants representing 67 percent were aware of the existence of the institutional repository whilst 28 respondents representing 33 percent indicated their lack of knowledge about the existence of an IR in the university.

4.3.6 Sources of Awareness of IR for Faculty Members

Faculty members who said they were aware of the IR were asked to indicate how they first heard of it. The results are presented in Table 4.11 below:

Table 4.11 Sources of Awareness of IR for Faculty Members

	Frequency	Percent (%)
Colleagues	14	10
Library	74	52.5
Internet	53	37.5
Total	141	100

Source: Empirical data, 2019

The result shows that 10 percent of the respondents got their information about the IR from their colleagues, 52.5 percent indicated they had the information from the library whereas 37.5 percent got their awareness through the internet.

4.3.7 Sources of Awareness of IR for Students

Student respondents who said they were aware of the IR were also to indicate how they first heard of it. This is presented in Table 4.12

Table 4.12 Sources of Awareness of IR for Students

	Frequency	Percent(%)
Colleague	5	5.9
Lecturer	10	11.8
Library	24	28.2
Internet	46	54.1
Total	85	100

Source: Empirical data, 2019

An examination of Table 4.12 indicates that 46 respondents representing 54.1 percent first heard of the IR through the internet. This was followed by 24 respondents representing 28.2 who heard of it

through the library. Ten participants representing 11.8 percent heard about the IR through a lecturer whilst 5 respondents representing 5.9 percent heard of it through a colleague.

4. 3.8 Self Evaluation of Faculty Members Knowledge of IR

The results of a further probe to measure the level of awareness of faculty members are presented in Table 4.13.

Table 4.13 How much do you know about IR

Statement	Cross Tabulation Of Responses			
	Faculty (n-141)		Students (n=85)	
	Freq.	%	F	%
I have heard of IR but I am not sure of the concept	37	26.5	31	36.5
I have adequate information about IR	78	55.1	48	56.5
I have not heard of IR until now	26	18.4	6	7

Empirical data, 2019

The results highlighted a self-evaluation of the level of awareness of the respondents and revealed that majority (78: 55.1%) of the participants had inadequate information about IR, 37 of them representing 26.5 percent have heard of it but were uncertain about the concept whilst 18.4 percent representing 26 respondents had not heard of it before the time of the survey.

4.3.9 IR Publicity

The IR has over the years employed various promotional strategies to inform the university community about its activities. The researcher therefore sought to determine the opinion of faculty members with regard to the adequacy or otherwise of the publicity given the IR.

Table 4.14 Adequacy of the Publicity of the IR

Statement	Faculty Members(n=141)		Students(n=85)	
	Freq.	%	Freq.	%
Adequately Publicised	40	28.3	14	16.5
Somehow Publicised	83	58.9	29	34.1
Inadequately Publicised	18	12.8	42	49.4
Total	141	100.0	85	100

Source: Empirical data, 2019

Results obtained from the faculty members as depicted in Table 4.14 above shows that 28.6 percent of the respondents indicated that the publicity was adequate, 58.9 percent said the publicity was somehow adequate whilst 12.8 percent said it was inadequately publicized.

Table 4.14 reveals that out of 85 student respondents 42 representing 49.4 percent indicated the publicity was inadequate, 34.1 percent said it was somehow adequate whilst 14 respondents representing 16.5 percent indicated it was adequate.

4.4.1 Level of Contribution to the Institutional Repository

Section C of the questionnaire sought to determine whether faculty members had deposited their documents on to the IR and if they had whether they uploaded it themselves or it was uploaded for them. The results are presented in Table 4.15.

Table 4.15 Level of Contribution to the IR

	Faculty Members Level of Contribution to the IR (n=141)			
	Yes		No	
	Freq.	%	Freq.	%
Contribution to IR	68	48	73	52
Self-Archiving	6	9	62	91-
Mediated Archiving	62	91	6	9

Source: Empirical data, 2019

Table 4.15 reveals that 68 respondents representing 48 percent have deposited their documents on the IR whilst 73 respondents representing 52% have not deposited their documents on the IR.

4.4.2 Self-Archiving or Mediated Archiving

Self-archiving is the process where the authors or contributors submit or deposit their own items into the repository by themselves whereas mediated archiving is done by IR staff where items are collected from authors and deposited by the staff.

4.4.3 Willingness to Deposit Documents on IR

Table 4.16 presents data on the willingness or otherwise of the respondents who have not deposited their documents on to the IR.

Table 4.16 Willingness to Deposit Documents on the IR

Response	Freq.	%
Yes	63	86
No	10	14
Total	73	100

Source: Empirical data, 2019

Out of a total of 73 respondents who have not deposited on the IR 63(86%) respondents expressed their willingness to deposit whilst only 10 representing 14 percent said they were not willing to deposit their documents on the IR.

4.4.4 Items Respondents Are Willing To Deposit

Table 4.17 Items to Deposit in the IR

Items	Yes	%	No	%	Total
Post print (peer review research articles)	92	(65)	49	(35)	141
Seminar paper	83	(59)	58	(41)	141
Thesis and Dissertation (abstract)	78	(55)	63	(45)	141
Thesis and dissertation (full test)	83	(59)	58	(41)	141
Books and book chapter	78	(55)	63	(45)	141
Conference proceedings	89	(63)	52	(37)	141
Reports	54	(38)	87	(62)	141

Images, audio and video	39	(28)	102	(72)	141
Preprint (Research articles before peer review)	34	(24)	107	(76)	141

Source: Empirical data, 2019

Table 4.17 illustrates the results obtained from those respondents who were willing to deposit their documents on to the IR. 92(65%) respondents indicated their desire to deposit post print documents while 49(35) respondents indicated otherwise. The respondents were also prepared to deposit Conference Proceedings with 63 percent representing 89 respondents saying yes to it whilst 52 (37%) said no. Eighty-three respondents (59%) indicated their willingness to deposit their Thesis and Dissertations (full text) and the same number of respondents indicated their preparedness to submit Seminar Papers (83: 59%). The abstracts of Thesis and Dissertations, and Books and Book Chapters were the next items the respondents were willing to deposit as these items attracted 55 percent positive response from 78 respondents. However, 87(62%) of the respondents indicated their unwillingness to deposit Reports, 72 percent said they were willing to submit images, audio and video whilst 24 percent indicated their desire to submit Preprint materials.

4.4.5 Reasons for Depositing Documents on the IR

Table 4.18 REASONS FOR DEPOSITING

Statement	SD	DA	NEUTRAL	A	SA
1 To communicate research results	14(10%)	16(11%)	6(4%)	63(45%)	42(30%)
2 Can add multi-media data to my work	12(9%)	16(11%)	3(2%)	58(41%)	52(37%)
3 Number of citation of my work gets increased	8(6%)	14(10%)	0(0%)	30(21%)	89(63%)
4 Increase my chances of getting promotion	92(65%)	22(16%)	10(7%)	14(10%)	3(2%)

5	Work is disseminated more quickly	7(5%)	12(8.5%)	2(1%)	98(69.5%)	22(16%)
6	My work will be permanently archived and available	2(1%)	10(7%)	0(0%)	87(62%)	42(30%)
7	Publish material is easy to find as compared to IR	6(4.2%)	9(6.4%)	2(1.4%)	98(70%)	26(18%)
8	IR protects it from plagiarism	35(25%)	34(24%)	6(4%)	49(35%)	17(12%)
9	Access to work is cheaper to others	14(10%)	10(7%)	5(4%)	54(38%)	58(41%)
10	Repository is well indexed and archived	4(3%)	14(10%)	6(4%)	25(18%)	92(65%)

Source: Empirical data, 2019

As per Table 4.18 the data results obtained sought to establish the extent to which faculty members agreed with statements relating to reasons for depositing their documents on the IR. The respondents were to indicate whether they Strongly Disagree (SD), Disagreed (DA) Neutral, Agree (A) Strongly Agree (SA) to the statement.

Sixty-three respondents representing 45 percent agreed with the first statement that the reason for depositing documents is to communicate results, 42 respondents representing 30 percent strongly, 14 respondents representing 10 percent strongly disagreed while 6 respondents representing 4 percent were undecided.

Fifty-eight respondents representing 41 percent agreed with the statement that depositing their document on the IR can add multi-media data to their work. This was followed by 52 respondents representing 37 percent whilst 16 percent disagreed and 12 percent strongly disagreed. Three respondents representing 2 percent were undecided.

The statement that the number of citation of the authors gets increased was strongly agreed to by 89 respondents representing 63 percent. Thirty respondents representing 21 percent agreed to the statement whilst 14 participants representing 10 percent disagreed. Eight participants representing 6 percent strongly disagreed with the statement. None of the respondents was undecided.

As high 92 participants representing 65 percent strongly disagreed with the statement that depositing their works on the IR increases their chances of getting promotion whilst 22 participants representing 16 percent disagreed with the statement. This was followed by 14 respondents representing 10 percent who agreed with the statement whereas only 3 participants representing 2 percent strongly agreed with the statement. Ten respondents representing 7 percent were undecided.

The statement that work is disseminated more quickly was agreed to by 98 representing 69.5 percent whilst 22 participants representing 16 percent strongly agreed to the statement. Seven respondents representing 5 percent strongly disagreed to the statement whereas 12 respondents representing 8.5 percent disagreed to the statement. Two participants representing 1 percent were undecided.

Another statement that documents will be permanently archived was agreed to 87 respondents representing 62 percent. Forty-two participants strongly agreed to the statement whilst 10

respondents representing 7 percent disagreed with only 2 respondents representing 1 percent strongly disagreeing to the statement.

Out of the 141 respondents 98 of them representing 70 percent agreed to the statement that published material is easy to find. Twenty six respondents representing 18 percent strongly agreed, 9 respondents representing 6.4 percent disagreed whereas 6 respondents representing 4.2 percent strongly disagreed to the statement.

The statement that IR protects documents from plagiarism was agreed to by 49 respondents representing 35 percent, 17 participants representing 12 percent strongly agreed to the statement, 25 percent strongly disagreed whilst 24 percent disagreed to the statement. Six participants representing 4 percent were undecided.

The statement access to work is cheaper to others was agreed to by 70 respondents constituting 49 percent, 63 respondents representing 45 percent strongly agreed whilst 8 respondents constituting 6 percent disagreed to the statement. None of the respondents strongly disagreed nor was undecided.

Finally, 4(3%) respondents strongly disagreed with the statement that the IR is well indexed and archived, 10 percent disagreed whereas 18 percent and 65 percent agreed and strongly agreed to the statement. Six participants constituting 4 percent were undecided.

4.4.6 Reasons for not depositing on the IR

Faculty members were asked to rank the factors that are likely to discourage them from depositing their documents on the IR. The results obtained are presented in Table 4.19 below:

Statement	SD	DA	NEUTRAL	A	SA
1. IR has low prestige	16(11%)	7(5%)	0(0%)	45(32%)	73(52%)
2. Others might copy my work without my permission	58(41%)	37(26%)	8(6%)	20(14%)	18(13%)
3. University might expect me to pay to deposit my work	73(52%)	38(27%)	0(0%)	18(13%)	12(8%)
4. Difficult and time consuming to deposit my work	12(8.5%)	10(7%)	6(4.3%)	68(48.2%)	45(32%)
5. Do not know how and what to deposit	51(36.2%)	40(28.4%)	0(0%)	24(17%)	26(18.4)
6. Once I deposit my work I cannot publish it elsewhere	67(47.5%)	42(30%)	3(2.1%)	16(11.4%)	13(9%)
7. Publishers will not allow me put my work on IR	46(33%)	48(34%)	18(13%)	20(14%)	9(6%)
8. My work may not be preserved in the Long run.	76(54%)	47(33%)	4(3%)	6(4.3%)	8(6%)
9. Lack of peer review will undermine my work	7(5%)	5(3.5%)	0(0%)	71(50%)	58(41%)

Source: Empirical data, 2019

In order to examine the factors that account for respondents not depositing their documents on the IR their responses to various statements were sought. There were nine statements in all and they had to choose from Strongly Disagree (SD), Disagree (D), Neutral, Agree (A) and Strongly Agree (SA). Table 4.19 shows that out of the 141 faculty members 73 of them representing 52 % strongly

agreed to the statement that IR has low prestige, 45 of them agreed to the statement whilst 16 strongly disagreed. Five percent of the participants disagreed to the statement and none of the respondents was undecided.

The researcher also presented a statement to find out if the fear of plagiarism could be a deterring factor to respondents from depositing their work on the IR and this statement was strongly disagreed to by 58 respondents representing 41 percent, 37 (26%) disagreed whilst 20 (14%) disagreed to the statement. Eighteen respondents representing 13 percent agreed to the statement whereas 12 respondents agreed to it. The result also indicates that 8 (6%) were undecided.

The statement university might expect me to pay to deposit my work was strongly disagreed by 73 respondents representing 52 percent, a further 38 respondents disagreed to the statement whilst 18(13%) and 12 (8%) respondents agreed and strongly agreed to the statement. No respondent was undecided.

The statement difficult and time consuming to deposit my work was agreed to by 68(48.2%) respondents whilst 45 (32%) strongly agreed to it. The same statement was strongly disagreed to by 12 (8.5%) and disagreed to 10 respondents representing 7 percent. Six respondents representing 4.3% of the respondents were undecided.

The statement “Do not know how and what to deposit” was strongly disagreed to by 51 respondents representing 36.2 percent whilst 40(28.4%) disagreed to it. None of the respondents was undecided but 26 respondents representing 18.4 percent strongly agreed to the statement whereas 24 (17%) respondents indicated they agreed to the statement.

Sixty-seven participants representing 47.5 percent strongly disagreed to the statement that “Once I deposit my work, I cannot publish it elsewhere” whilst 42(30%) of them disagreed to the same statement. However, 16(11.4%) agreed to the statement whereas 13 respondents representing 9 percent strongly agreed to it. Three respondents representing 2.1 percent were undecided.

Table 4.19 also shows that 46 respondents representing 33 percent strongly disagreed to the statement that “The publisher will not allow me put my document on the IR”, 48(33%) of the participants indicated they disagreed to the statement whilst 20(14%) respondents agreed to the statement. For the same statement 18 (13%) respondents were undecided whilst 9(6%) strongly agreed to it.

The statement “My work may not be preserved in the long run” was strongly disagreed to by majority (76:54%) of the respondents, 47(33%) disagreed, 8(6%) strongly agreed whilst 6 respondents representing 4.3 percent agreed to the statement.

Majority (71:50%) of the respondents strongly agreed to the statement that “The lack of peer review will undermine my work,” 58 respondents representing 41 percent also agreed to the same statement. However, 7 respondents representing 5 percent strongly disagreed to the statement whilst 5 respondents agreed to it. None of the respondents was undecided.

4.5 Purpose for Using the Institutional Repository

4.5.1 Frequency of use

The current study sought to examine the access and the main purpose of the respondents for using the IR. Responses on the frequency of using the IR were given based on four statements. The results obtained are displayed in Table 4.20.

Table 4.20 Frequency of IR usage

Statement	Faculty Members(n=141)		Students(n=85)	
	Freq.	%	Freq.	%
At least once every two weeks	17	12	14	16.5
At least once a month	43	30.5	32	37.5
Whenever I need to	72	51.1	28	33
Never	9	6.4	7	8
Total	141	100.0	85	100

Source: Empirical data, 2019

When asked how often they used the UDS IR majority (72, 51.1%) of the faculty members indicated they use the IR whenever they need to, followed by 43(30.5%) who indicated that they use the IR at least once a month whilst 17 respondents representing 12 percent indicated that they use the IR at least once every two weeks. However, 9 respondents making 6.4 percent indicated that they never used the IR

Out of the 85 respondents 32(37.5%) of the respondents use the IR once a month, 28(33%) of them indicated that they use the IR whenever they need to, 14(16.5%) of them indicated they use it at least once a week month and only 4 (5%) indicated that they use it at least once a day, 7(8%) indicated they never use it.

4.5.2 Purpose for Using the Institutional Repository

Table 4.21 Purpose for Using the IR by Faculty Members

Statement	Frequency	Percent
To submit my research articles	52	37
Search for research articles	61	43
Search for all kinds of information	28	20
Total	141	100.0

Source: Field Data, 2019

Table 4.21 displays the responses of the participants to three statements that sought to examine the main purpose for using the IR. The results indicate that 52 respondents representing 37 percent indicated that their main purpose for the IR is to submit their research articles, 61(43%)

Table 4.21 displays the responses of the participants to three statements that sought to examine the main purpose for using the IR. The results indicate that 52 respondents representing 37 percent indicated that their main purpose for the IR is to submit their research articles, 61(43%) indicated

their main purpose as to search for research articles whilst 28(20%) indicated that their main purpose for using the IR is to search for all kinds of information.

Table 4.22 Purpose for Using the IR by Students

	Frequency	Percent
To access thesis and dissertations	64	75
Search for journal articles	18	21
Search for all kinds of information	3	4
Total	85	100

Source: Empirical data, 2019

An examination of Table 4.22 shows that the majority (64:75%) of students use the IR to access thesis and dissertations whilst 21 percent of them use the mainly to search for journal articles. Only 3 respondents representing 4 percent indicated that they use the IR to search for all kinds of information.

4.5.3 Level of Satisfaction

The questionnaire was also designed to solicit data on the level of satisfaction of participants with regard to the utilization of the IR. The results are presented in Table 4.23.

Out of the 141 respondents who were faculty members 46 of them representing 32.6 percent indicated that the IR was somewhat useful to them, 37 (26.2%) indicated the IR was useful whilst 41 respondents representing 29.1 percent indicated it was very useful. However, 17 respondents constituting 12.1 percent indicated that the IR was not useful to them.

Table 4.23 Level of Satisfaction

Statement	Cross Tabulation of Response			
	Faculty Members(n=141)		Students(n=85)	
	Freq.	%	Freq.	%
Very Useful	41	29.1	21	25.0
Useful	37	26.2	21	25.0
Somehow Useful	46	32.6	14	16.0
Not Useful	17	12.1	29	34.0
Total	141	100.0	85	100

Source Empirical data, 2019

Table 4.23 shows a cross tabulation of the responses received from faculty members and students concerning how useful the IR has been to them. The data reveals that 21 respondents representing 25 percent indicated that the IR was very useful to them; similarly, 21 respondents representing 25 percent indicated that the IR is useful to them. Out of the 85 respondents 14 respondents representing 16 percent indicated the IR was somewhat useful. On the other hand, 29 respondents constituting 34 percent indicated that the IR was not useful.

4.6 Benefits of the Institutional Repository

Faculty members were asked to indicate their level of agreement or disagreement with some statements on the benefits of the IR to the institution.

Strongly Disagree (SD) Disagree DA Neutral (N) Agree (A) Strongly Agree (SA)

Table 4.25 Benefits of IR to the Institution

Statement	SD	DA	N	A	SA
Increase visibility status and public	0(0%)	12(8%)	0(0%)	78(55.1)	52(36.9%)

value

Enhances quality of teaching	0(0%)	20(14%)	0(0%)	80(57%)	41(29%)
Digital preservation	0 (0%)	0(0%)	0(0%)	43(30.6%)	98(69.4%)
IR serves as a primary publication site	17(12.1%)	20 (14%)	0(0%)	55(39%)	49(34.7)
Secure access to institutions research data	0(0%)	0 (0 %)	0(0%)	83(58.8%)	58 (41.2%)

Source: Empirical data, 2019

Table 4.25 shows that the majority of the respondents (78: 55.1%) agreed to the statement that IR increases the visibility status and public value of the institution whilst 52(36.9%) strongly agreed to the statement.

The statement IR enhances quality of teaching was agreed to by 80 (57%) respondents whilst 41 (29%) strongly agreed to the same statement. Twenty respondents constituting 14 percent disagreed to the statement whereas none of them was undecided or strongly disagreed.

It is also evident from Table 4.25 that 98(69.4%) of the faculty members strongly agreed to the statement that IR enables digital preservation whilst 43 (30.6%) agreed it. None of the participants was undecided, neither disagreed nor strongly disagreed to the statement.

Fifty-five faculty members constituting 39 percent of the respondents agreed to the statement that the IR serves as a primary publication site, 49(34.7%) strongly agreed whilst none of them was undecided. However, 17(12.1%) strongly disagreed to the statement whilst 20(14%) also disagreed with the statement.

Table 4.26 Benefits of IR to the institution

Statement	SD	DA	N	A	SA
Increases visibility status and public value of the institution	0(0%)	6(7%)	0(0%)	44(52%)	35 (41%)
Potential students get to about the research areas of the institution	0(0%)	4(5%)	0(0%)	48(56%)	33(39%)
Enhances digital preservation	0(0%)	0(0%)	0(0%)	21(25%)	64(75%)
Secure access to the institutions research data	7(8%)	3(4%)	0(0%)	42(49%)	33(39%)

Source: Field data, 2019

Table 4.26 indicates the response of students to statements on the benefits of the IR to the Institution. It is evident from the table that the majority (44: 52%) of the respondents agreed to the statement that IR increases the visibility status and public value of the institution. Thirty-five participants (41%) strongly agreed to the statement whilst 6(7%) disagreed with the statement.

The statement that potential students get to know about the research areas of the institution through the IR was agreed to 48(56%) respondents whilst 33(39%) strongly agreed to it.

The statement that IR Increases visibility status and public value of the institution whilst 35 constituting 41% strongly agreed to it. Six respondents representing 5 percent disagreed with the statement. None of the respondents was undecided neither did anyone of them strongly disagreed with the statement.

The data in Table 4.26 also indicates that 64(75%) respondents strongly agreed to the statement that “IR enhances digital preservation of the institution”, 21(25%) respondents agreed to the statement whilst no respondent disagreed, strongly disagreed nor was undecided.

Finally, the statement that “IR ensures secured access to the research data of the institution” was agreed to by 42 (49%) respondent whilst 33(39%) strongly agreed to it. The response for strongly disagreed was 7(8%), those who disagreed to the statement were 3(4%).None of the participants was undecided.

4.6.1 Table 4.27 Benefits of Institutional Repository to Faculty Members

Statement	SD	DA	N	A	SA
IR helps me make preprints available online		22(16%)	-	- 83(59%)	36(25%)
Increased impact of my publications as an author	23(16.7%)	-	-	82(58.3%)	36(25%)
Increase visibility of my research output	-	-	-	76(54%)	65(46%)
IR helps me manage and store digital content related to my research	56(40%)	13(9%)	-	-	72(51%)
IR provides links to other to documents in other repositories.	18(13%)	10(7%)	-	87(62%)	25(18%)

Source: Empirical Data, 2019

Faculty members were to state the extent to which they agreed or disagreed to some statements on the benefits of IR to them. The result shows that majority of the respondents 76 (54%) agreed with the statement, “Increased visibility of my research output” while 65 (45%) of them strongly agreed to it.

Majority of the faculty members 82(58.3%) agreed to the statement, “ Increased impact of my publications as an author” as one of the benefits of IR to them whilst 36(25%) strongly agreed to the statement. However, 23(16.7%) of the participants disagreed to the statement. Research made freely available can be disseminated more widely and have greater impact. Work done on citation analysis has demonstrated that research that is made freely available is going to be easier to cite.

It is also evident from the results obtained that the statement “IR helps me make preprints available online” was strongly agreed to by majority 83(59%) of the respondents, 36(25%) agreed to it whilst 22(16%) disagreed. This advantage offered by the IR ensures that authors are able to publish their research and get to be cited as being the first to publish such research outcomes in the fast moving subjects such as the Sciences.

The statement “IR helps me manage and store digital content related to my research”, was also agreed to by majority 72(51%) of the respondents, 56(40%) strongly agreed whilst 13 (9%) disagreed to it. None of the respondents was undecided.

The last statement in this category was “IR provides links to other documents in other repositories.” This statement was agreed to by 87(62%) of the respondents, 25(18%) also agreed to it whilst 18(13%) disagreed and 10 (7%) of the respondents strongly disagreed to it.

4.6.2 Benefits of Institutional Repository (IR) to Students

Table 4.28 Benefits of IR to Students

Statement	SD	DA	N	A	SA
IR enhances learning and innovation	0(0%)	0(0%)	0(0%)	46(54.2%)	39(45.8%)
I have access to electronic thesis and dissertations	0%	14(16.7%)	0(0%)	50(58.3%)	21(25%)
I have access to journal articles authored	0	14(16%)	0	21(25%)	50(59%)

by UDS lecturers

IR helps me to accomplish task
more efficiently 8(9%) 0 0 43(51%) 34(40%)

IR helps to improve the quality of my work 0 14(16%) 0 21(25%) 50(59%)

Source: Empirical data, 2019

Five statements on the benefits of IR to the student were posed to examine the degree to which the student respondents agreed with them. Table 4.28 shows that majority of the respondents (46, 54.2%) agreed with the statement, “IR enhances learning and innovation” while 39(45.8%) of them strongly agreed to it. No respondent was undecided. Also there were no respondents who strongly neither disagreed nor disagree to the statement.

Fifty respondents constituting 58.3 percent agreed to the statement, I have access to electronic thesis and dissertations” while 21(25%) strongly agreed to the statement. However, 14(16.7%) of the participants disagreed to the statement. None of the respondents was undecided or strongly disagreed to the statement.

It is also evident from Table 4.28 that the statement “I have access to journal articles authored by UDS lecturers” was strongly agreed to by majority (50, 59%) of the student respondents, 21(25%)

4.7 Challenges of using Institutional Repositories (IRs)

In order to highlight the challenges confronting users of the IR faculty members were to indicate if they strongly disagree (SD) disagree (DA) neutral (N) agree (A) or strongly agree (SA) to any of the five statements in Table 4.30. The data are illustrated below:

Agreed to it whilst 14(16%) disagreed. No respondent was undecided and no respondent strongly disagreed to the statement.

The statement “IR helps me to accomplish task more efficiently” was also agreed to by majority (43,51%) of the respondents, 34(40%) strongly agreed whilst 8(9%) disagreed to it. There were no undecided respondents.

The last statement in this category was “IR helps me improve the quality of my work.” This was strongly agreed to by 50(59%). Twenty-one respondents representing 25 percent also agreed to the statement whereas none strongly disagreed or was undecided.

Table 4.29 Challenges facing faculty members in the use of the IR

Statement	SD	DA	NEUTRAL	A	SA
Lack of knowledge or awareness of IR	6 (4%)	17(12%)	0	94(67%)	24(17%)
Inadequate or erratic power supply	0	0	0	76(54%)	65(46%)
Insufficient technological skills	70(50%)	42(30%)	0	23(16%)	6(4%)
Inadequate ICT connectivity and infrastructure	0	16(11%)	0	94(67%)	31(22%)
Insufficient information provided by IR	27(19%)	31(22%)	0	58(41%)	25(18%)

Source: Empirical data, 2019

Table 4.29 shows that majority (94:67%) of the participants agreed to the statement that “lack of knowledge or awareness of IR” was a major challenge to users of the IR. This was followed by 24(17%) who indicated they strongly agreed to the statement whilst 6(4%) and 17(12%) respondents strongly disagreed and disagreed respectively to the statement. None of the participants was undecided.

Another statement, “Inadequate or erratic power supply” was agreed to by the majority (76,54%) of the respondents whilst the rest of them (65, 46%) strongly agreed to the statement. None of the respondents was undecided nor did any of them indicate strongly disagree or disagree to the statement.

Seventy respondents constituting 50 percent indicated they strongly disagreed to the statement that, “Insufficient technological skills” was a challenge inhibiting IR usage, 42(30%) also disagreed with the statement whilst none of them was undecided. However, 23(16%) and 6(4%) agreed and strongly agreed to the statement.

“Inadequate ICT connectivity and infrastructure” was also agreed to by 94(67%) respondents whilst 31(22%) indicated they agreed to the statement. Sixteen respondents representing 11 percent disagreed with the statement whereas no respondent was undecided or strongly disagreed to it.

It is also clear from Table 4.29 that 58(41%) of the respondents indicated they agree to the statement “Insufficient information provided by IR,” 25(18%) strongly agreed to it whilst 27 (19%) strongly disagreed to the statement. Again, 31(22%) disagreed to the statement and none of the respondents was undecided.

4.7.1 Challenges facing students in the use of the IR

The researcher in order to examine the challenges facing students in their use of the IR provided statements to which the respondents were to indicate their level of agreement or disagreement to the statements. Strongly Disagree (SD) Disagree (DA) Neutral (N) Agree (A) Strongly Agree (SA)

Table 4.30 Challenges of IR

Statement	SD	DA	NEUTRAL	A	SA
Lack of knowledge or awareness of IR	-	-	-	52(61%)	33(39%)
Inadequate or erratic power supply	-	-	-	49(58%)	36(42%)
Insufficient technological skills	43(51%)	27(32%)	-	8(9%)	7(8%)
Inadequate ICT connectivity and infrastructure	-	10(12%)	-	43(51%)	32(37%)
Insufficient information provided by IR	-	-	-	45(53%)	40(47%)

Source: Empirical data, 2019

From Table 4.30 when the student participants were asked to indicate the extent to which the lack of knowledge or awareness of IR” affects their use of the IR the majority (52:61%) agreed to the statement and 33(39%) strongly agreed to it. No respondent took a neutral stance and no respondent disagreed or strongly disagreed to the statement.

On whether inadequate or erratic power supply was a challenge 49(58%) respondents agreed to the statement whilst 36(42%) respondents strongly agreed to it. None of the participants was undecided and no respondent disagreed or strongly disagreed to the statement.

Another statement to probe the technological skills of students against the use of the IR was strongly disagreed to by 43(51%) of the respondents, 27(32%) disagreed to it whilst none of the respondents took a neutral stance. However, 8(9%) agreed to the statement. In the same vein, 7(8%) respondents strongly agreed to the statement.

The statement “Inadequate ICT connectivity and infrastructure” was agreed to by majority (43, 51%) of the respondents as a challenge facing the users of the IR. Thirty-two respondents constituting 37% also strongly agreed to the statement. None of the respondents was undecided and none of them strongly disagreed to the statement. Ten respondents representing 12 percent disagreed to the statement.

The statement “Insufficient information provided by IR” was agreed to by 45(53%) respondents whilst 40(47%) strongly agreed to it. No participant was undecided and no participant disagreed or strongly disagreed to the statement.

4.9 Qualitative Data Analysis

4.9.1 Introduction

The qualitative data were collected through semi-structured interviews with 9 members of the IR department comprising the university librarian, 3 IR staff, 4 IR campus representatives and the head of the Technical Services all of the UDS Library. All the 9 respondents were successfully interviewed. For the sake of confidentiality and anonymity the interviewee have been assigned the letters of the alphabet, A, B, C, D, E, F, G, H, I.

4.9.2 Promotion and awareness creation

For the current study the level of awareness of the faculty members and students was regarded as one factor that could enhance or inhibit contribution and usage of the IR. In the discussion with the interviewees all nine interviewees confirmed that the UDS IR had an IR Team which consulted with other IRs in Ghana before the IR became operational. The same IR Team promoted and marketed the IR to the various communities within the university.

Besides, Thompson, Akeriwe and Aikins (2016) reports that an Assistant Librarian from UDS spent two weeks on placement working at the Institutional Repository of the Kwame Nkrumah University of Science and Technology (KNUST) in order to go back and assist with the establishment of the IR at UDS.

Significantly, Interviewee B was satisfied with the outcome of the work of the IR Team and had this to say:

The IR Team has done a lot of publicity for the IR. The level of awareness is very high and this reflects in the improvement in the submission of documents. Yes, our efforts are bearing fruits.(Interviewee B)

The lack of proper briefing for the institutional repository staff before the start a marketing and promotional programme was identified by interviewee E as a major challenge facing the IR.

Interviewee E;

As I am sitting like this, I have not had any special training or even briefing concerning the IR. We just observe what they are doing and we try do the same. Here, you learn on the job.

It also came to light that although membership of the IR Team had changed over a period of time some of the original members were still part of the team to ensure continuity.

However, two of the interviewees identified the lack of space for the discussion of the IR at meetings organised by the faculty and schools boards on campus. IRs are often discussed as part of Any other Business (AoB) on the agenda of most of the meetings. This gives IR representatives limited time to educate members on about the benefits of IR.

According to Interviewee D: *I nearly had a problem with one of the Deans because he will not just allow me to talk at one of the Faculty Board meetings. I had my hand up for a long time and when the Dean finally gave me the opportunity to speak I was told I could not go beyond five minutes. (Interviewee D)*

It also came to light that there was no coordination between the IR Team and the Deans regarding the orientation for fresh graduate students. The Deans have never invited the Library or the IR to such occasions. According to one interviewee C: *“it is only when you are aware of something that you can request to be part of it. But they organise orientation for the students and then the students begin attending lectures without involving the library. The students only visit the library when they have a difficulty looking for information.”*

However, some of the campus representatives indicated they had the maximum cooperation of the Deans especially with regard to the orientation of students. They are usually invited to take part in most of the activities organised for students by the various departments.

4.9.3 Contribution to the IR

Content recruitment is a key aspect of IR. The ease with which members of an institution are able to self-archive affects their level of contribution to the IR. It emerge from the interviews that most of the content of the UDS IR was uploaded by the staff of the IR. According to one Interviewee E:

the lecturers often submit their documents in word which we convert to searchable PDF format before we then upload it. IR staff uploaded most of the documents. This may account for the improvement in the rate of submission. If lecturers are prepared to submit their works it is only convenient that IR staff upload it for them, that way the lecturers will give you more articles to upload.

This finding is consistent with the finding of the current study which shows an improvement in the submission rate of 46 percent as compared to the submission rate of 13.2 percent reported in a previous study by Thompson et al.(2016) at the same University. in which as high as 86.8 percent had not submitted. That is a as compared to 46 percent submission rate in the current study.

The researcher also examined the existing content harvesting and recruitment procedures in order to establish if there is collaboration between the IR and the schools and faculties on campus. All the 9 interviews indicated that the Deans of the schools and faculties cooperated very well with the IR any time they were approached to assistance.

According to the Interviewee B: *Mediated archiving is labour-intensive and requires higher staff numbers to achieve desired results. Our staff are over-stretched and ideally, self-archiving is the best form of archiving. This option this is increasingly becoming a challenge because getting depositors to commit to regular self-archiving is problematic.*

Before a document is uploaded the issue of copyright needs to be clarified with the author and in some cases with publishers. In the case of the UDS IR one interviewee intimidated that the staff of the IR were mandated to check for copyright before uploading on to the IR. Copyright concerns have been cited as one of the main obstacles to self- archiving and submission of documents on the IR.

In order to overcome this challenge the copyright status of all submitted files is verified on behalf of the contributors so as to encourage faculty members and other researchers to increase their deposits. The IR has the SHERPA/ROMEEO service embedded in its system to augment the manual checking of copyright status of almost every item deposited in its collections. All the interviewees agreed that this strategy has contributed significantly in increasing the number of items in the repository.

It also came to light that the UDSIR browses other academic social networks and then collects publications and other academic materials created by the staff of the university and preserves them on their behalf in the repository.

4.9.5 Benefits of IR

One of the functions of the IR is to gather the research output of the institution on one platform and make it available to a global audience thus increasing the visibility and public value of the institution. In this regard the IR must be interoperable to allow for online searches of its content.

According to Interviewee B:

The IR has guidelines for those willing to submit. These guidelines are followed in order to make the IR interoperable. The IR can be searched on Google. We are working on the metadata so that the IR appears on Google scholar.

It has been observed by Giesecke (2011) that faculty members may submit documents which do not meet the quality standards of interoperability of IRs. These documents need to be corrected before they are uploaded to make them identifiable by search engines such as Google.

In order to increase participation of faculty members and students in the IR one interviewee said there was the need to reorganize the IR Team to include faculty members on its membership. This will ensure that decisions taken at meetings of the IR Team are easily communicated to faculty members.

4.9.6 Growth and Sustainability of the IR

For an institutional repository that started in 2014 by scanning and digitizing old thesis and dissertations of students eight out of the nine interviewees expressed satisfaction with the growth of the IR. The formation of an IR Team put in-charge of advocacy and presence of IR campus representatives were all seen as measures to ensure growth and sustainability of the IR.

Equally, the harvesting of documents of faculty members were all deemed as measures that could lead to further growth of the UDS IR.

4.9.6.1 Challenges of the Institutional Repository

4.9.6.2 Lack of Training of IR Staff

The institutional repository of the UDS like its counterparts in most developing countries is faced with a number of challenges which hinder its full utilization. These include the lack of training of IR staff. Any library staff from any section could be assigned to the IR and the old staff there could

be taken to other sections of the Library. The Assistant Librarian who benefited from placement at the Kwame Nkrumah University of Science and Technology was re-assigned at the time of the current study.

4.9.6.3 Financial Constraint

Financial constraint was also indicated by the interviewees as a major challenge facing the UDS IR. This is so because the IR relied on the Library to meet its expenditure whilst the Library has to compete with other departments for its budget. Setting up a repository and running it involve a lot of cost.

4.9.6.4 Low bandwidth and ICT Infrastructure

The institutional repository operates via the internet the speed of which often determines the speed at which users are able to upload and download documents. It is a known fact that the speed of the internet also depends on the bandwidth, low bandwidth results in low speed whilst high bandwidth would result in high speed.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 Introduction

This chapter discusses the findings of the current research under the following theme: demographic data, awareness of the existence of IR, level of contribution to IR, motivating factors for using the IR, benefits of IR and the challenges facing users of IR. The discussion covers both quantitative and qualitative data collected for the study.

The quantitative data were collected from two categories of respondents, faculty members and graduate students whilst the qualitative data were collected the IR managers.

5.2 Demographic Data Analysis

The target population was 633 of faculty members, 346 of graduate students and 9 Institutional Repository (IR) managers. The sample population was 30 percent of 633 for the faculty members and 30 percent for the students. All the 9 IR managers were surveyed. Out of 190 questionnaires distributed to faculty members 141 were received and out of the 104 questionnaires distributed among students 88 were received but 85 were found usable.

5.2.1 Gender

The issue of gender is very important in every aspect of the research to ensure that fair and unbiased results are obtained. The study revealed that there were more males than females among all the three categories of the respondents, faculty members, graduate students and IR managers. The results confirm the study by Budu (2015) that there were more males than females at the tertiary level of education in Ghana. Among the IR managers of the UDS Library there were 5 males and 4 females out of the 9 respondents interviewed. There were therefore more males than females among the IR managers. This also confirms the study by Bumbie-Chi (2018) in which the author found that contrary to the perception that librarianship was a female dominated profession the UDS Library had more male staff than females.

5.2.2 Age

The demographic data also revealed an interesting range in the age distribution of the respondents. It was observed that the largest number of the faculty members (68, 48%) was aged 31 – 40 years, followed by 41 – 50 years (34, 24%) and then 28 (20%) respondents were aged 51 – 60years old. There were 11 respondents who were aged 21 – 30 years but none of the respondents was above 60 years old.

An examination of the age distribution of the students shows that the majority of them were aged 26 – 33 years old as 50 percent fell within this category. This was followed by those aged 18 – 25 years old whilst another 17(20%) respondents were aged 34 – 41 years old. Only small minority (9.4%) of the respondents were between 42 – 49 years old which implies that the majority of the respondents were age 18 – 41 years old.

The implication for the age distribution of the faculty members and the graduate students is that the UDS has both a youthful academic staff and graduate students which is a positive factor for the growth and development of the IR as the youth are perceived to be technologically inclined and highly receptive to its related services (Budu, 2015).

5.3 Awareness of the Institutional Repository (IR)

The first objective of the study was to examine the level of awareness of the respondents about the Institutional Repository (IR). The first major finding of the study is that all the categories of respondents had a high level of awareness of the existence of the IR in UDS. This confirms findings by Manchu and Vasudevan (2018) who found a high level of awareness of IR at the University of Calicut in India. Also, Dhanavandan & Tamizhchelvan (2013) discovered that majority of faculty members had a high level of awareness of the IR at the Annamalai University, Tamil Nadu, India. Similarly, Thompson, Akeriwe and Aikins (2016) indicated a high level of awareness of IR at the University for Development Studies in Ghana. The high level of awareness may be attributed to the promotional and marketing activities embarked upon by the universities. The high level of awareness, however, contradicts the findings of Ratanya (2017) who discovered low level of awareness among faculty members at Egerton University, Egerton, Kenya. Similarly the finding also contradicts the findings of Boufarss(2012) who reported low level of awareness among faculty members at the Petroleum Institute (PI) in Malaysia. It was also observed that a high level of awareness may not necessarily translate into high rate of submission of documents. As was the case in the findings of Thompson et al (2016) at the UDS where despite a high level of awareness of 66.2% the rate of submission was 13.2%.

Another major finding of the study is that the majority of the faculty members first heard about the UDS IR from the Library. This is supported by the finding of Kathewera (2016) who in a study of faculty and students of Lilongwe University of Agriculture and Natural Resources, Malawi discovered that majority of the respondents first heard of the IR through the library newsletter. The reason for large number of faculty members getting their information about the IR through the Library could be attributed to the various interactive programmes organised by the library for faculty members.

It was also discovered that the majority of the students first heard of the IR through the internet. This could also be attributed to the lack of orientation or awareness programmes by the library for graduate students.

5.4 Contribution to the Institutional Repository

The second objective was to assess the level of contribution of faculty members to the IR. A major finding of the study is that there is low rate of submission of documents at the UDS IR. This finding is supported by the findings of Abrizah (2012) and Creaser et al. (2010) who indicated that low submission of documents by faculty members in institutional repositories is a global phenomenon. However, the rate of submission of 48% discovered by this study was significantly higher than the previous submission rate of 13.2% reported by Thompson, Akeriwe and Aikins (2016) in a study at the same UDS. This is an indication that some progress has been made over the past few years in terms of increasing the level of contribution by faculty members.

Another major finding of the study is that majority of faculty members agreed to the statement that they deposit their documents on the IR in order to communicate their research. This finding supports the findings of Katherewa (2016) in a study conducted at the Lilongwe University of Agriculture and Natural Resources, Malawi and discovered that majority of the staff were depositing their documents on the IR in order to communicate their research results.

Similarly, the finding of the study is supported by the findings of Dhanavandan and Tamizhchelvan (2013) who also found that the dissemination of research to the widest audience possible was the reason for faculty members' contributing to the repository.

Similarly, the study reveals that the majority of the respondents agreed to the statement that the number of citation of the authors gets increased if they deposit their works with the IR.

Majority of the respondents disagreed with the statement that depositing their works on the IR increases their chances of getting promotion. This finding confirms the findings of Makori et al (2015) who found the lack of incentives for depositors in the University of Nairobi as a disincentive to those who contribute to IR.

Another major finding of the study is that the fear of plagiarism is therefore an issue confronting potential depositors. However, this finding contradicts the findings of a study conducted by Manchu, & Vasudevan, (2018) who found that only 27.9% of the respondents agreed that IR protects their work from plagiarism.

A major finding of the study is that majority of all the categories of respondents agreed to the statement “access to work is cheaper to others”. This finding is similar to the findings of Kim (2007) who finds that faculty members are motivated to submit their works by the fact that accessibility to their research will increase.

The possible reasons for faculty members’ non-submission of documents were assessed and this revealed that majority of the faculty members indicated that it was difficult and time consuming to deposit their work on the IR. This finding is in tandem with the finding of Ammarukleart (2017) who in a study of the factors that influence the adoption and utilization of institutional repositories in Thailand find that faculty members preferred an easy submission process that was less time consuming and also not cumbersome to use. This could hinder self-archiving and therefore lead to low patronage. For the current study ease of use was considered as one factor that could affect the decision of faculty members to deposit their documents on the IR.

Similarly, Tmava and Miksa (2017) discovered that although majority of the faculty members were prepared to participate in an OA IR, difficulty with the submission process tendered to impede their participation in institutional repositories.

Another major finding of the study is that majority of the respondents were aware of the type of items to deposit on the IR. This is in agreement with the finding of by Tiemo and Ebiagbe (2016) who discovered that faculty members at the Niger Delta University in Nigeria were aware of the items to deposit on the institutional repository. The implication is that there is an increased level of awareness and appreciation of the work of the IR.

Majority of the respondents disagreed to the statement that “once I deposit my work I cannot publish it elsewhere”. This finding contradicts the finding of Kathewera (2016) who found that 40% of the respondents in a study conducted in Malawi indicated copy right as an issue that hinders submission of documents on the IR. This implies that they did not see the issue of copy right as a hindrance to the participation in the IR. This may be due to the fact that the UDS IR offers to contact copy right owners to resolve copy right issues before uploading documents.

Casey(2012) attributes the low level of contribution by faculty to the Institutional Repository to the lack of institutional policies and mandatory requirements in addition to the lack of motivation for faculty members and researchers.

The fear of plagiarism could hinder respondents from depositing their work on the IR. A major finding of the study is that majority of the respondents agreed that plagiarism could serve as a hindrance to submission of documents. This finding is in line with the findings of Abrizah (2013) who reported the fear of plagiarism amongst staff of the University of Technology, Malaysia as a challenge to submission of documents to the repository.

Self-archiving and mediated archiving are the two major ways by which documents are uploaded on to the IR. A major finding of the study is that majority of those who have contributed to the IR had their documents uploaded for them. The rate of mediated-archiving was therefore higher than the rate of self-archiving. This finding is similar to the finding of Tapfuma (2016) who conducted a study on the utilization of open access institutional repositories in Zimbabwe and found that majority of those who deposited their works did not do it themselves but had someone to do it for them. The perception of ease of use was seen as a factor that determines the continuous patronage

or utilization of the IR. From the findings users did not upload their work because they thought the task was difficult.

Another major finding is that those who have not contributed to the IR indicated their willingness to deposit their documents on the IR. This finding confirms findings by Abrizah(2013) who in a study of faculty members at the University of Technology, Malaysia found that faculty members were willing to contribute to the repository and prepared to support open access.

5.5 Purpose for Using the Institutional Repository

The current study sought to examine the access and the main purpose for using the IR by first taking a look at the frequency at which respondents visited the UDSIR. It was discovered that the majority of the faculty members use the IR anytime there was the need for them to do so. The implication is that they use the IR occasionally. This finding is supported by Nunda and Elia(2019) who studied the use of institutional repositories by postgraduates of Muhimbili University of health and Allied Sciences and Sokoine University of agriculture in Tanzania and found that the respondents use the IR occasionally. The frequency of use which is the actual use could be said to be influenced by the behavioural intention which is also determined by the factor of Perceived Ease of Use (PEOU) of the IR. If users visit the IR and find it easy to use they will continue to use it. However, if users find the IR cumbersome or difficult to use they will shun its usage.

Another finding of the study is that majority of faculty members use the IR to search for research articles. This was followed by the submission of research articles and then to search for all kinds of information. The study also found that majority of the students use the IR to access thesis and dissertations. This finding is in line with the findings of Abdelrahman (2017) who in a study of

graduate students at the University of Khartoum found that students mainly use the IR to access ETDs and ebooks.

Similarly, in a study of the role of research students in an institutional repository at the Loughborough University Pickton & McKnight (2006) find that students were more interested in having access to complete theses, postprints and conference papers.

Another major finding of the study is that all the categories of the respondents agreed that IR increases the visibility status and public value of the institution.

Majority of the faculty members also agreed to the statement “IR enhances quality of teaching”.

The result shows that majority of the respondents agreed that by depositing their works on the IR “Increased visibility of my research output” them agreed to it.

Another major finding of the study is that majority of the faculty members agreed to the statement, “ Increased impact of my publications as an author”. This finding confirms the finding of Manjunatha and Thandavamoorthy (2011) who discovered that majority of the respondents who use the IRs in universities in Karnataka, India indicated they deposit their documents on the IR in order to disseminate their research.

Majority of the respondents agreed that using the IR allows them to have access to electronic thesis and dissertations. This finding is in line with the findings of Abdelrahman (2017) who in a study of graduate students at the University of Khartoum found that students mainly use the IR to access ETDs and eBooks.

Finally, majority of the respondents agreed that to the statement that “IR helps me to accomplish task more efficiently”.

5.7 Challenges

It was discovered that that majority of the faculty members and students agreed that “Inadequate or erratic power supply” was a challenge confronting users of the IR. This finding is in line with the finding of Boufarss(2010) who in a study of the development of IRs in Nigeria found erratic power supply as one of the impediments to the development of IRs.

The study also discovered the inadequate ICT connectivity and infrastructure as a major challenge confronting the users of the IR This finding is in tandem with the findings of Boufarss(2010) who found the lack of ICT infrastructure and facilities in institutional repositories in Nigeria. .

A major challenge for the IR managers is the low level of self-archiving which puts a lot pressure on the staff especially when one considers that they have to digitize some of the documents which are often brought in hard copies.

The lack of training of new members of the IR Team to appraise them on the pertinent issues pertaining to the IR was also mentioned as one of the challenges confronting the UDS IR.

It was also discovered that the UDS IR does not have a written marketing plan or strategy to guide its activities in promoting the IR. The importance of a marketing plan cannot be over-emphasized it as lays down the details of activities, resource allocations, time frames and responsibilities that govern the marketing or promotional activities of an organization. Advocacy plays a key role in content recruitment which is a major issue facing IRs worldwide.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This study was carried out in order to examine the impact of the institutional repository of the University for Development Studies, Tamale on teaching, learning and research in the university.

6.2 Summary of Findings

The study sought to examine how the utilization of the institutional repository (IR) of the University for Development Studies, Tamale has impacted on teaching, learning and research at the University. The findings of the study are based on the views of faculty members, graduate students and the IR managers, who are the major contributors or authors, users and custodians of the IR of the UDS. A summary of the findings of the study are presented as follows:

6.2.1 Demographic Characteristics of Respondents

The University for Development Studies has a youth faculty members and students whilst the library has more males than females. The youthful population has a positive implication for the development of the institutional repository as asserted by Budu(2015)

6.2.2 Awareness of Respondents on IR

The first objective of the study was to examine the level of IR awareness of the respondents in order to find out how this affects their participation in the IR. Response from faculty members, students and the IR managers shows that the level of awareness was high and that majority of the faculty members first heard of the IR from the Library. However, the majority of the students first heard of the IR by browsing the internet.

The qualitative data also reveals that the nine interviewees rated the level of awareness as high. They all expressed satisfaction with the level of awareness of the respondents.

The majority of the faculty members first heard of the IR from the library, all the same, they were not satisfied with the publicity programmes embarked upon by the Library as they indicated that the publicity programme was not adequate.

6.2.3. Contribution to the IR

The level of contribution to the IR was low although the present rate of submission was higher than the previous rate reported by Thompson et al. (2016) at the same university. Faculty members are the major contributors to the institutional repository and often contribute because of the following reasons: to communicate or publish their research results, to increase their number of

citations, to permanently preserve their work, to ensure that their work is easy to find, and because the IR is well indexed and archived.

The possible reasons for faculty members' non-submission of documents were assessed and this revealed that majority of the faculty members indicated it was difficult and time consuming to deposit their my work on the IR. The ease of use was considered as a factor that could affect the decision of faculty members to deposit their documents on the IR.

The fear of plagiarism was seen as a hindrance to contribution of faculty members. Majority of the respondents were aware of the type of items to deposit on the IR were aware that they could deposit their documents on the IR and still publish them elsewhere. Most of the respondents were of the opinion that the IR will preserve their work in the long run. However, the lack of peer-review of IR documents was indicated as a deterrent to authors and depositors.

6.2.4 Utilization of the IR

Majority of the faculty members use the IR when they need to whilst most of the students use the IR at least once a month. The study also found that majority of the students use the IR to access thesis and dissertations. This finding in line with the findings of Abdelrahman(2017) who in a study of graduate students at the University of Khartoum found that students mainly use the IR to access ETDs and ebooks.

6.2.5 Benefits of IR

The benefits of depositing their documents include the ability of authors to be able to communicate their research articles to a global audience. It also includes authors getting cited thereby increasing their visibility. Another benefit of the IR is that it increases the visibility status and public value of the institution. One other benefit of the IR is that it increases the visibility of the research output of faculty members.

Finally, by making the work of faculty members accessible and available to all users across the world faculty members get to cited thereby increasing the impact of their publications.

6.2.6 Challenges

The UDS institutional repository, from the results of the study, faces a number of challenges which include the lack of electrical power generators on all the campuses of the university. Constant power supply is needed to enable the IR servers to operate and also for users have access to the electronic documents they need.

Financial constraint is one of the major challenges facing the management of intellectual property of UDS. Funding needed for the both establishment and operation of UDS Institutional Repository is solely sourced from the University's internally generated funds.

The low bandwidth and the lack of ICT infrastructure is also a challenge impeding the efficient use of the IR.

The lack of a well-structured written marketing plan/strategy to guide the activities of the IR is also a major challenge.. A marketing plan lays down the details of activities, resource allocations, time frames and responsibilities that govern the marketing or promotional activities of an organization. Since content recruitment is a major issue facing IRs worldwide, it is important that a strategic marketing plan be implemented in order to gain effective results..

6.3 Conclusion

Institutional repositories are an important infrastructure supporting the scholarly activities of academic institutions. Their utilization by faculty members and students must be a priority to IR managers and the management of the academic institution. This study sought to assess the impact of an institutional repository on the teaching, learning and research in an academic institution through the use of the Technology Acceptance Model (TAM). The current study reveals that the behaviour of users of IR could be influenced through the adoption of certain policies.

Challenges such as ICT connectivity and infrastructure and erratic power supply must therefore not be allowed to hamper the efficient utilization of the IR in enhancing, teaching, learning and research at the University for development Studies, Tamale. In an era where IRs must contend with shrinking budgets it is only imperative that IRs take measures to overcome the challenges affecting their full utilization.

6.4 Recommendations

In line with the Technology Acceptance Model (TAM) it is possible to influence the use of the IR by faculty members and students by implementing the following recommendations.

6.4.1 Periodic Training for Institutional Repository users

The management of the University for Development Studies Institutional Repository should embark on the training of faculty members periodically to enable them become conversant with how to upload their documents on the IR. The use of workshops could help equip depositors and users with the skills that would make it easy for them to self-archive which could lead to an increase in the rate of submission of documents. Do-It-Yourself (DIY) short videos could be put on the IR interface and the Library website to guide contributors on how to upload their documents. The issue of plagiarism needs to be tackled properly to get faculty members to deposit

their works on the IR. This could be done through awareness creation seminars which should be organised with the cooperation of the various departments and the university management.

6.4.2 Provision of ICT infrastructure

The IR relies on the internet to function. The challenge has always been the low bandwidth which makes retrieval of documents very slow. Management should ensure that service providers increase the bandwidth to the various campuses of the University. There is also the need to increase the number of computers in the Library so that as many users as possible would have easy access to upload or download from the institutional repository.

6.4.3 Provision of Electric Power Generators

The lack of standby electric power generators on all the campuses was a challenge to the users of the IR. Management should give this the necessary attention that it deserves and get the plants installed as a matter of urgency. It must be put on record that at time of this study the Library was in the process of installing a plant on both the Nyankpala and Tamale Campuses which implies two more campuses (Wa and Navrongo) are to be taken care of in future.

6.4.4 The need for a marketing plan

There is the need for the management of the UDS IR to develop a strategic marketing plan so as to ensure that an effective line of advocacy is followed to achieve maximum results. The marketing will outline the various roles and goals of the IR and how to gain the support of faculty members, students and researchers.

6.4.5 Motivation and Incentives for Authors and Staff

The management of UDS should institute incentive packages for faculty members and other staff who deposit their work on the repository. These incentives could include funding for research and further studies.

6.4.6 Staff training and motivation

Management of the library should support the staff of the IR financially to attend training workshops, conferences and seminars both at the national and international level.

6.5 Areas for further research

The current study was limited to only the institutional repository of the University for Development Studies, Tamale in Ghana. The limited time within which the research was carried out were all factors which significantly constrained and influenced the conduct of the research. There is therefore the need to carry out further studies in a comprehensive investigation of institutional repositories in Ghana to be able to draw generalized conclusions.

There is also the need to examine how the various disciplines and the different categories of faculty members and students use and contribute to the IR. Future studies could carry out a comparative study between institutional repositories of public and private universities or even between newer and older university IRs to find out how the dynamics play out in the different academic setting.

Finally, it is equally important to carry out studies on how IRs undertake awareness creation and advocacy in order to improve on such activities to achieve maximum results.

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APPENDIX I

UNIVERSITY OF GHANA

COLLEGE OF EDUCATION
DEPARTMENT OF INFORMATION STUDIES

Questionnaire for Lecturers

This questionnaire is designed to collect data on the topic: “**Enhancing Teaching, Learning and Research: Assessment of the Impact of the Institutional Repository of the University for Development Studies, Tamale.**” The data collected is for academic purpose only and all information provided will be treated with maximum confidentiality. Please, your objective response is therefore being solicited. Your kind cooperation is appreciated in advance.

SECTION A:

Background Information

1. Age category 1). 20 – 29 years [] 2). 30 – 39 years [] 3). 40 – 49 []
4). 50 – 59 years [] 5). 60 and above []
2. Please indicate your rank. 1). Professor [] 2). Associate Professor [] 3). Senior Lecturer [] 4). Lecturer [] 5). Assistant Lecturer []
3. How long have you worked in UDS ? 1. Less than 1 year [] 2. 1 – 3 years [] 3. 4 – 7 years [] 4. 8 – 10 years [] 5. 10 years and above []
4. Campus 1). Wa [] 2). Navrongo [] 3). Tamale [] 4. Nyankpala []
5. Faculty.....

SECTION B: LEVEL OF AWARENESS OF INSTITUTIONAL REPOSITORY

6. Are you aware of the existence of an Institutional Repository in UDS?
1. Yes [] 2. No []
7. If your answer is yes, how did you first hear of it? 1. Colleague [] 2) Library [] 3) Internet surfing []
8. How much do you know about Institutional Repositories (IRs)?
 1. I had not heard of IR until now []
 2. I have heard of IR but I am not exactly sure of the concept []
 3. I have adequate information about IRs []
 4. I am an expert when it comes to IR. []

9. Do you think that the UDS IR has been publicized adequately in the University to attract members of the University community?

- 1). Adequately publicized [] 2). Somehow adequately publicized [] 3. Inadequately publicized [] 4. Not publicized []

SECTION C: CONTRIBUTION TO INSTITUTIONAL REPOSITORY

10. Have you ever deposited your document on the UDS IR?

1. Yes [] 2. No []

11. If your answer is yes, who uploaded the document?

1. Self [] 2. Library Staff [] 3. Assisted by library staff [] 4. Colleague []

12. If you uploaded the document yourself, do you think it takes a lot of effort to upload a document on the IR?

1. A lot of effort [] 2. A little effort [] 3. No effort []

13. If you have not deposited your document, will you consider depositing your documents on the IR?

- 1) Yes [] 2). No []

14. What types of material will/did you deposit in an IR? Please tick (√).

1.	Preprint (Research articles before peer review)	
2.	Postprint (peer reviewed research articles)	
3.	Seminar paper	
4.	Thesis and Dissertations (abstract)	
5.	Thesis and Dissertations (full text)	
6.	Books and book chapters	
7.	Conference proceedings	
8.	Reports	
9.	Images, audio and Video	

15. How do you rate the reasons for contributing to Institutional Repository? [1= Strongly Disagree, 2= Disagree, 3= Do not Disagree/Agree, 4= Agree 5= Strongly Agree]

	Reasons for Contribution to IRs	1Strongly Disagree	2Disagree	3Do not Disagree/ Agree	4.Agree	5.Strongly Agree
1.	To Communicate Research Results					
2.	Can add multimedia data to my work					
3.	Number of citations of my work gets increase					
4.	Increases my chances of getting promotion					
5.	Work is disseminated more quickly					
6.	Work will be permanently archived and available					
7.	Published material is easy to find					
8.	IR protects it from plagiarism					
9.	access to work is cheaper to others					
10.	Repository is well indexed and archived					

Q 16. Why do you not contribute to an Institutional Repository?

[1= Strongly Disagree. 2= Disagree, 3= Do not Agree/ Disagree, 4= Agree 5= Strongly Agree]

	Reasons for Not Contributing to IR	1 Strongly Disagree	2 Disagree	3 Do not Agree/Disagree	4 Agree	5 Strongly Agree
1.	Prefer to make my work available only on my personal website					
2.	Repository has low prestige					

3.	Others might copy my work without my permission					
4.	University might expect me to pay to deposit my work					
5.	Difficult and time-consuming to deposit my work					
6.	Do not know How and what to deposit					
7.	Concerned that if I deposit my work in the University's Repository I may not be able to publish it elsewhere					
8.	Publishers would not let me put my work in a Repository					
9.	Concerned that my work might not be preserved in the long term					
10.	No peer-review process					

SECTION D: MOTIVATING FACTORS FOR USING THE INSTITUTIONAL REPOSITORY

17. How often do you use the Institutional Repository?

1. At least once a day [] 2. At least once every week [] 3. At least once every 2 weeks []
 4. At least once a month [] 5. Whenever I need to [] 6. Once in a while [] 7. Never []

18. What do you use the Institutional Repository for? Please tick (√) appropriately.

1. To submit my research articles [] 2. Search for research articles []
 3. Search for information []

19. How useful is the IR to you?

- 1).Very useful [] 2).Useful [] 3). Somewhat useful [] 4). Not useful []

SECTION E: BENEFITS OF INSTITUTIONAL REPOSITORY

20. What are the benefits of Institutional Repositories to the university?

Based on a five point pre-coded scale described as: [1= Strongly Disagree, 2= Disagree, 3= Do not Disagree/ Agree, 4= Strongly Agree 5= Agree]

	Question	1 Strongly Disagree	2 Disagree	3 Do not Disagree/ Agree	4 Strongly Agree	5 Agree
1.	Visibility status and public value					
2.	Enhancing quality of teaching					
3.	Digital preservation					
4.	Engaging the university and enhancing scholarly collaborations					
5.	Primary publication site for e.g., theses and dissertations					
6.	Secure access to institution's research data					

21. What are the benefits of Institutional Repositories to you as an individual?

Based on a five point pre-coded scale described as: [1=Strongly Disagree, 2= Disagree, 3= Do not Disagree/Agree 4= Agree 5= Strongly Agree]

		1Strongly Disagree	2Disagree	3Do not Disagree/Agree	4Agree	5Strongly Agree
1.	IRs enables me acquire new knowledge					
2.	My performance on the job is enhanced					
3.	IRs help me effectively manage and store information I need					

4.	IRs help me to accomplish tasks more efficiently.					
5.	IRs improve the quality of my working life					

SECTION F: CHALLENGES WITH THE USE OF INSTITUTIONAL REPOSITORIES

22. To what extent do you agree with the following statements relating to the challenges

Of using IRs?

Statement 1. Strongly Disagree 2. Disagree 3. Do not Disagree/ Agree 4 Strongly Agree 5. Agree

	Statement	1 Strongly Disagree	2 Disagree	3 Do not Disagree/Agree	4 Strongly Agree	5 Agree
1.	IRs risk reducing the value of peer review process					
2.	IRs will expose more research to plagiarism					
3.	When everyone deposits there is no competitive advantage					
4.	IRs are not as easy to use as journal indexes					
5.	IRs may breach confidentiality of some data					
6.	Depositing to an IR adds extra workload					
7.	Lack of peer review will undermine my work					
8.	Inadequate ICT connectivity and infrastructure					
9.	Copyright issues					

10.	Absence of incentives for authors					
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Thank you for your cooperation

APPENDIX II

UNIVERSITY OF GHANA

COLLEGE OF EDUCATION
DEPARTMENT OF INFORMATION STUDIES

QUESTIONNAIRE FOR GRADUATE STUDENTS

Introduction: This questionnaire is being administered to selected participants to solicit information on the study “**Enhancing teaching, learning and research: assessment of the impact of the Institutional Repository of the University for Development Studies, Tamale.**” I would be grateful if you could respond to all the questions provided below. The answers given will be used for academic purpose only and all information provided will be treated with utmost confidentiality.

Contact: If you have any questions, please send them to the researcher ; email: abass.karara@uds.edu.gh or call: 0243241975.

Demographic Data of Respondent

Please tick [] the appropriate box that corresponds to your response.

1. Gender : 1). Male [] 2). Female []
2. Age: 1). 18 – 25 years [] 2). 26 – 33year [] 3). 34 – 41year [] 4). 42 – 49year [] 5). 50 years and above []
4. How long have you studied in UDS? 1). Less than 1 year [] 2). 1 – 3 years []
- 3). 4 years and Above []
5. Programme of Study.....

The Awareness of Institutional Repository Service

Please tick () appropriately.

6. Have you ever heard of an institutional repository? 1). Yes []
- 2). No []
7. Are you aware of the existence of an IR in UDS 1). Yes [] 2. No []
8. If your answer to 6 is yes, how did you get to know about the institutional repository?

- 1). From Colleagues [] 2). Library [] 3) Lecturer [] 4).
Internet browsing [] ...

9. If your answer to Question 6 is No, what do you think accounts for this?

- 1). Lack of awareness creation [] 2). Lack of library orientation
for postgraduates []. 3). No library guides for students []

Frequency of use

10. How often do you use the Institutional Repository?

- 1). At least once a day [] 2). At least once every week [] 3). At least once every 2
weeks [] 4). At least once a month [] 5). whenever I need to [] 6). Once in a while []
7. Never [].

Purpose

11. What do you use the Institutional Repository for? Please tick (✓) appropriately.

1. To access theses and dissertations [] 2). Search for journal articles []
3. Search for all types of information []

12. How do you access the institutional repository? Please tick (✓) appropriately

1. University website [] 2. Library website [] 3. Google []

Benefits of the Institutional Repository

13. How useful is the IR to you?

Very useful [] Useful [] somewhat useful [] Not useful []

14 . What are the benefits of Institutional Repositories to you as an individual?

Based on a five point pre-coded scale described as: [1= Strongly Disagree, 2= Disagree, 3 =Do not Disagree, 4= Strongly Agree 5= Agree]

		1 Strongly Disagree	2 Disagree	3 Do not Disagree/ Agree	4. Strongly Agree	5 Agree
1.	IRs enables me acquire new knowledge and innovative ideas					

2.	I have access to electronic theses and dissertations					
3.	I have access to journal articles authored by UDS lecturers					
4.	IRs help me to accomplish tasks more efficiently.					
5.	IRs improve the quality of my work					

15. Would you recommend the institutional repository to a colleague? 1. Yes [] 2. No []

16. Would you use the repository again for your future studies? 1. Yes [] 2. No []

Challenges with the use of the Institutional Repository

17. What are the challenges with the use of the Institutional Repository

Based on a five point pre-coded scale described as: [1= Strongly Disagree, 2= Disagree, 3= Do not Disagree/Agree, 4= Agree 5= Strongly Agree]

	Challenges with IR usage	1. Strongly Disagree	2. Disagree	3. Do not Disagree/ Agree	4. Agree	5. Strongly Agree
1.	Lack of knowledge or awareness of Institutional repositories					
2.	Inadequate or erratic power supply					
3.	Insufficient technological skills					
4.	Copyright issues					
5.	Inadequate ICT connectivity and infrastructure					
6.	Insufficient information provided by IR					

18. What measures are necessary to resolve the challenges that hinder the usage of the Institutional Repository

Based on a five point pre-coded scale described as: [1= Strongly Disagree, 2= Disagree, 3= Do not Disagree/Agree, 4= Agree 5= Strongly Agree]

		1.Strongly Disagree	2.Disagree	3.Do not Disagree/Agree	4.Agree	5.Strongly Agree
	Increase awareness creation					
	Provision of electric power generators on campus					
	Resolve Copyright issues with authors					
	Increase ICT connectivity and infrastructure					

Thank you for your cooperation.

APPENDIX III

INTERVIEW GUIDE

UNIVERSITY LIBRARIAN

1. What were the events that led to the founding of the IR?
2. What was the biggest motivating factor? (preservation, image projection, sharing etc)
3. What obstacles were encountered in the founding of the IR and how were they addressed?
4. What are your core functions so long as the operation of the repository is concerned?
5. What task roles do the different library departments (technical services, public services, archives) play in the IR development/management?
6. What are the sources of funding for the IR?

Policy

7. Have you reviewed the IR policy after its inception?
 - a. If yes: Which aspect was reviewed?
 - i. Was it a response to a problem?
 - b. If no: Are you considering reviewing?
 - i. And which aspect?

Marketing/promotion/awareness-creation

8. So far, how is the awareness of the campus community about the repository like?
9. What have been the means through which the repository has been made aware to the campus community?
10. How do you make lecturers aware of the repository?
11. What has been the approach for reaching out to students?
12. Which category of students has been your target?
13. Is there a committee or an individual, within or outside, responsible for marketing and promoting the IR campus-wide and beyond?
 - a. If no: Could there be formal or structured schemes to promote the IR among the campus community and beyond?
14. Is there a budgetary allocation or a fund to advertise the existence of the repository to the campus community and beyond?
15. Is such a fund for the promotion of the IR even necessary at all?
16. Is there a programme and set target for this?
17. Are the promotion programmes successful?
18. What accounts for this success or failure?

19. What more could be done to market the IR to faculty and thus increase the patronage of the repository?

Material submission

20. What is the focus with respect to the kind of materials for populating the content of the repository?

21. Is the rate at which materials have been deposited in the repository satisfactory?

22. Is there any zeal on the part of lecturers and researchers to deposit materials to the repository?

23. What are the avenues available to you to persuade lecturers/researchers and students to contribute content to the repository?

24. What more could be/is being done to further increase the rate at which the repository content is populated?

25. In your view, do members of this campus appreciate the peculiar advantages or significance of the IR to project the university to the outside world?

26. Have the peculiar benefits of the IR been well understood by the campus community to ensure their buy-in?

If yes: Why is it that they still don't submit contents even though they appreciate the significance?

27. What constraints face material depositors?

28. Has there been any effort at assisting lecturers to secure their intellectual property rights even when they publish in journals, in order for such journal articles to be eligible for the repository?

Use

29. Are you satisfied with the hits per day or week or month of the repository?

30. What is the proportion of local and international traffic to the repository like?

Assessment

31. How do you assess the success or otherwise of the IR?

32. How would you define IR success?

33. Do you have any examples of the benefits the IR has produced?

34. For this repository to last a long time, what should be done to increase material deposit?

35. How about usage? What more should be done to increase the use of the repository?

36. What other resources will be needed to put the IR in good shape?

Challenges

37. What challenges do you see for the IR?

38. What opportunities do you see for the IR?
39. Are there other people or units that should be brought on board?
40. Should some others who are on board now be taken off?
41. With the benefit of hindsight, when given the opportunity to create or manage the repository again, what would you do differently?

HEAD, INSTITUTIONAL REPOSITORY

1. What are your functions with respect to the Institutional repository?
2. Prior to the operation of this Institutional repository, have you been involved in any other repository?

Materials Submission

3. What types of materials do you collect?
4. Who authors the materials?
5. How are materials submitted?
6. What guidelines are followed in collecting or submitting materials for the repository?
7. Do you have an editor(s)?
8. How do you judge content?
9. How do you know if something is appropriate?
10. How do you know if something belongs in a collection (subdivision)?
11. What formats are collected?
12. Do you take all formats?
13. Is it brought to you or you go for it or it is both ways?
14. Has the rate at which contents have been deposited in the repository satisfactory?
15. By way of statistics, which faculty or department contributes materials the most to the repository?
16. What accounts for such high contributions as compared to the other departments or faculties?
17. What are the avenues available to you to persuade the campus community to contribute content to the repository?
18. What more could be done/is being done to further increase the rate at which the repository content is populated?

Metadata application

19. What types of metadata are assigned to a material before adding to the content?

20. Is it author-supplied or library-supplied?

Access Control/usage

21. How do you manage digital rights?

a. Do you authenticate?

b. Do you support logins?*

c. Do you have to be on campus to access or submit?

22. Is the rate at which the repository is being accessed satisfactory?

23. Are there limits on viewing full-text (on-campus; by the author)?

24. Does the IR belong to a larger cooperative which harvests contents to the global scale?

25. Is the repository accessible beyond the campus community?

26. Is the repository being accessed by the campus community or it has international traffic as well?

Policy Development

27. Who can deposit?

28. Is there an approval process?

29. Can things be withdrawn?

30. Who owns the content?

31. Is participation mandatory for some groups (such as post-graduate students)?

32. Who checks copyright?

Marketing/promotion and awareness creation of the Institutional Repository

33. What are the avenues available to you to persuade the campus community to use the repository?

34. Has your outfit considered the use of social media as an avenue to create awareness among lecturers about the need to deposit content?

35. What are some of the existing collaborative efforts with other bodies on-campus or off-campus to promote the repository?

36. Which of these avenues have been more effective?

37. Why do you think it/they have been more effective?

38. Which of them has/have been less effective?

39. Why do you think they have been less effective?
40. Are there formal or structured schemes or a committee to promote the IR among the campus community and beyond?
41. In your view, do members of this campus appreciate the significance of the IR to project the university to the outside world?
 - a. If no: Why do you think they don't understand?
 - b. If yes: Why is it that they still don't submit contents even though they appreciate the significance?

Assessment

42. What was the biggest motivating factor for the establishment of the repository?
43. How would you define IR success?
44. Do you have any examples of the benefits the IR has produced?
45. In your general assessment, is the repository living up to the policy framework?
46. What have been some of the practical constraints faced in the implementation of the IR.
47. If you could develop the IR again, what would you do differently?

HEAD, TECHNICAL SERVICES UNIT

1. What are your core functions so long as the operation of the repository is concerned?

2. Did you assess the need for an IR prior to planning? How?
3. What were the events that led to the founding of the IR?
4. What was the biggest motivating factor?
5. What are the sources of funding for the IR?
6. Could you please explain to us the capacity of the bandwidth dedicated to the IR?
7. Is it enough to accommodate increasing traffic on the repository?
8. *Is it able to accommodate the growing size of the IR?
9. Is there a back-up strategy in the event of any mishaps?
10. Apart from the IR, what other digital initiatives exist to enhance the image of the university?
11. Which other persons/units or departments are responsible for the digital initiatives of the university?
12. What obstacles were encountered in the founding of the IR and how were they addressed?
13. In order for this repository to last longer, what should be done differently?
14. Will it require a review of policy?

Policy Development

15. Is the IR accommodated in the overall ICT policy of the university?
16. What practical challenges has the IR encountered so far?
17. Does this challenge(s) require a review of the IR policy?
18. Is participation mandatory for some groups (dissertations)?
19. Who owns the content?
20. Who checks copyright?

Promotion

21. Are there limits on viewing full-text (on-campus; by the author)?
22. Do you belong to a larger cooperative?
23. Is the repository being accessed by the campus community or it has international traffic as well?
24. Is the rate at which the repository is accessed satisfactory?
25. What are the avenues available to you to persuade the campus community to use the repository?

26. Is your outfit engaged in programmes or projects that will increase the awareness of the campus community of the IR?
27. What are some of the existing collaborative efforts with other bodies on-campus or off-campus to promote the repository?
28. Which of these avenues have been more effective?
29. Why do you think it/they have been more effective?
30. Which of them has/have been less effective?
31. Why do you think they have been less effective?
32. Has your outfit considered the use of social media as an avenue to create awareness among lecturers about the need to deposit materials?
33. Do you have to be on campus to access or submit?

Material submission

34. Is the number of materials in the repository satisfactory?
35. What more could be/is being done to further increase the rate at which the repository content is populated?
36. What are the avenues available to you to persuade the campus community to contribute content to the repository?
37. Is there a budgetary allocation or a fund to advertise the existence of the repository to the campus community and beyond?
38. Is it even necessary to separately channel efforts at promoting the repository for use?

Sustainability

39. Do you have any examples of the benefits the IR has produced?
40. Do you think this repository is sustainable?
41. How long will it last?
42. In your view, do members of this campus appreciate the significance of the IR to project the university to the outside world?
43. Has there been any effort at assisting lecturers to secure their intellectual property rights even when they publish in journals, in order for such journal articles to be eligible for the repository?
44. What challenges and opportunities do you see for the IR?
45. If the IR is to be developed again, what do you think should be done differently?

INSTITUTIONAL REPOSITORY STAFF

1. What is your role or core functions in the IR?
2. Which other sections of the UDS Library play key roles in the preservation of content in the IR.
3. How are the documents tracked or monitored to ascertain their longevity?
4. Is there a preservation policy for the repository?
5. If yes: Were the policies put in place before or after you developed the IR (are they a response to a problem?)
6. How do you address copyright issues linked to preservation?
7. Are materials submitted in an easy-to-preserve format?
8. What are the various preservation plans for the different materials in the repository?
9. Do you back up the entire content of the repository?
10. How often is this backing-up done?
11. Do you convert file formats (i.e. Word to PDF or HTML)?
12. How often do you update formats?
13. How do you see the longevity of materials in the repository?
14. What are the challenges and opportunities you see for the IR?
15. If this repository is to be developed again, what different preservation strategy would you adopt?
16. What practical/operational challenges are encountered in the preservation of contents of the IR and how are they addressed?
17. Is archival material included?

Benefits of Institutional Repositories

18. Do you have any examples of the benefits the IR has produced?
19. Is your outfit involved in the marketing and promotion of the IR?
20. How has this been done?
21. If not, how best could you assist in promoting the IR for content contribution and use by the campus community?
22. How could the process be improved?
23. What are the main channels through which this university is projected worldwide?
 - a. Probe: How about institutional repositories?
24. Does it really showcase what the university has to the outside world without any restriction?

APPENDIX IV



UNIVERSITY OF GHANA
DEPARTMENT OF INFORMATION STUDIES
SCHOOL OF INFORMATION AND COMMUNICATION STUDIES

Ref. No.:

March 11, 2019

The Registrar
University for Development Studies
Tamale

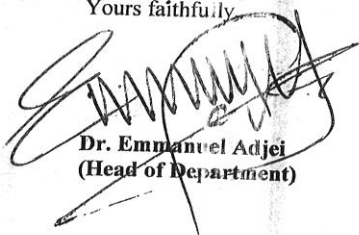
Dear Sir/Madam,

LETTER OF INTRODUCTION

This is to introduce to you **Mr. Abass K. Ibrahim**, an MPhil student of the Department of Information Studies. He is researching on the topic: **“Enhancing teaching, learning and research: assessment of the impact of the Institutional Repository of the University for Development Studies, Tamale”**. Abass is expected to submit his Thesis as part of the requirement for the MPhil programme.

We would appreciate any support you can give him.

Yours faithfully



Dr. Emmanuel Adjei
(Head of Department)

COLLEGE OF EDUCATION