

**ROLE OF LIBRARIANS IN MITIGATING INFORMATION EXPLOSION IN
ACADEMIC LIBRARIES: THE CASE STUDY OF THE JOMO KENYATTA
MEMORIAL LIBRARY-UON**

NYANGOYA KWAMBOKA BOLYVIA

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DECLARATION

This research is my original work and it has not been submitted for examination to any other university.

Bolyvia Kwamboka Nyangoya

Registration number: C54/82462/2015

Signature:  _____ Date: November 29th, 2020 _____

This research project has been submitted for examination with our approval as the university supervisors.

Dr. Dorothy Njiraine

Department of Library and Information Science

Signature:  _____ Date: 19th November 2020

Dr. George Kingo'ri

Department of Library and Information Science

Signature:  _____ Date: 19th November 2020

DEDICATION

This research is dedicated to my supervisors, family, Baby Tamazinah, friends and staff of Aga Khan High School for the support they have given me during the process.

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ABSTRACT

University libraries are meant to support the mission of the parent institutions. The growing need for information has made institutions to stay abreast with discoveries thus causing an increased availability of published and non-published information to institutions, which in return has led to overabundance of data thus making it difficult for information users to access the authentic information. The aim of the study was to investigate the role of librarians in mitigating information explosion in academic libraries with a review of the University of Nairobi's Library. The objectives were to: examine the awareness levels of information explosion among the library users at library; establish the effects of information explosion amongst the library users; assess information searching skills of the users at; and propose appropriate strategies for mitigating information explosion. The study used a descriptive research design and purposive sampling technique. The University of Nairobi was purposively selected on its merit. The researcher utilized a Sample size of 208 respondents. Questionnaires were issued to the master's students and interview guides were administered to library staff to collect data, which was analyzed using Statistical Packages for Social Sciences and Microsoft Excel software. The results were then presented in tables and charts as appropriate with explanations given in prose. Findings from the research indicated that; the majority of the library users had challenges in accessing information. Results from library staff indicated that the appropriate strategies to mitigate information explosion were the adoption of Information Communication Technology. In conclusion, there is a need to embrace new Information Communication Technology, information literacy and train staff to impart the same to users.

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LIST OF ABBRIVIATIONS AND ACRONYMS

ALA:	American Library Association
ICT:	Information Communication Technology
JKML:	Jomo Kenyatta Memorial Library (of the University of Nairobi)
KM:	Knowledge Management
QMS:	Quality Management Systems
UAB:	Universitat Autònoma de Barcelona
UEF:	University of Eastern Finland
UoN:	University of Nairobi

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter includes a discussion on the background of information explosion, information explosion worldwide, context of the study, statement of the problem, purpose of the study, objectives and research questions, assumption, significance, scope and limitations of the study, definition of terms, and chapter summary.

1.1 Background to the Study

Farhoomand et al. (2014) defines information explosion as a situation in which data is over-abundantly available to the public. It is a situation whereby end users and information managers are overpowered by abundance of information. As the availability of information increases, the challenge of managing such information becomes even more difficult. The information explosion has been cited as one of the reasons behind information overload as noted by Ifijeh, (2010:1-15). Academic libraries are meant to support teaching and learning needs of an organization. They provide the most current information resources to their users who may be the students, teaching and non-teaching staff. As a critical component of a university, library information facilitates teaching, publication, research, conservation of information as well as extension services. The functions of libraries include; selection and securing of learning materials, classifying and cataloging of the acquired information, referencing and information services, support research processes, documentation and bibliography, advisory services on education programs, consultations, management, and administrative services.

At the turn of the 20th century, information communication technology started advancing at a rapid pace worldwide in terms of development, (Kamar 2014:106). This resulted in libraries evolving at a very fast speed to be able to accomplish all the above functions for user satisfaction. The emergence of the internet and the web contributed to easier transmission and accessibility of information packaged in various formats from all over the world. The various formats of information provided an opportunity for publishers to pave access to their published online information via online subscriptions via the web. However, the internet alone has not substituted presence of print library resources.

Physical library resources and databases or library systems are believed to contain quality information as noted by Kamar, (2014:121) and superior quality for academic information. For this reason, library users and information professionals are facing numerous challenges in keeping up with user needs. In academic libraries, the scenario is the same as students normally require and expect speedy, easy and continuous access to information with flexible, comfortable places to individually, (Robert 2015:560). Information explosion influences how learning materials are selected and acquired, how acquired resources are organized as well as their reference (Kadiri and Adetoro, 2012: 41). The influence of information explosion on these functions of a library is attributed to the high expectations that library users have as well as the limited funding options available. This advancement in technology has contributed to the enormous information available hence exceeding the capacity of institutions to purchase.

The 21st century came along with new tools and techniques for creating content and distributing information to global audiences, (Kazi ,2014:55). This is considered a solution to information managers though they are still striving to serve an increasingly large number of users using the

limited budget and the effects of information explosion since everyday they have to go through a number of information materials from the wider sources in order to filter out the best materials. The challenge is for information users to get access to this available quality information. The routine of users having to browse a whole range of resources to locate their required information is challenging and can result in fatigue and unexpected anxieties (Kazi 2014:56).

At the global level, several academic libraries have adapted new ways of managing information explosion. Balague et al (2015: 331-341) says knowledge management has become a key component in libraries across the world. The authors in a report found that in Finland, the University of Eastern Finland (UEF) initiated a Quality Management System (QMS) as one of its knowledge management tools to manage information explosion. The QMS was initiated to enable communication between the library's users and managers. The UEF according to the report decided to utilize tools at its disposal to enable users find information easily. With this in mind, the library designed easy to navigate web pages which would provide information to their users at the click of a button. The library also included online discussion forums for the students and added tools that support projects and dissertations into their intranet.

In Germany, Saarti & Juntunen (2011: 145-146) notes that the IZUS/UB University of Stuttgart created a Wiki to replace the old library folder system. The Wiki contained specific content for a specific set of library users. This would enable groups of targeted library users to access their targeted information straight away without browsing through thousands of pages on the internet as information is pre-selected and posted on the Wiki. The Universitat Autònoma de Barcelona (UAB) in Spain set up quality management systems (QMS) in the late 1990s in their university library. The QMS were meant to help in sieving through information to enable library managers to select and update their information for library users. The UAB QMS works by merging

databases, wikis, and web pages by assembling their information. Later the UAB adopted the use of Wiki (Anwarul 2014:317-321).

In Africa, many academic libraries and institutions have not done enough to manage information explosion according to Rexwhite and Ocholla (2017:1). The two authors state that in Nigeria and South Africa, the use of ICT and Knowledge Management (KM) is limited in universities across the two states. The authors say knowledge and use of ICT among library staff and users is limited in both countries. Due to this, they argue, many library staff are not able to sieve information and provide the most relevant information in libraries especially on online platforms for users. Likewise, they argue many library users lack relevant skills on how to conduct research online and hence end up getting too much literature on their areas of interest. This literature overwhelms them and hence they cannot make a meaningful decision. They call for use of proper management of information explosion to help African library users obtain relevant information both online and in libraries.

According to Anunobu et al. (2011:34-39), African institutions and libraries have generally made an effort in managing information explosion, although they still need much improvement. The authors cite the use of online cataloguing in various libraries hence one can access the information easily without physically visiting the universities. Ridwan (2015:130) argues that library managers in Botswana, South Africa and Egypt have transformed themselves from mere custodians of knowledge to facilitators of library information to users. They have adopted ICT tools, undergone training and have collaborated with other academic universities across Africa to sieve and catalogue relevant and up to date data on various disciplines.

Kenya too has been affected by information explosion being experienced by both library users and staff. The rise of globalization turning the world into a global village has seen the flow of information rise to levels that confuse rather than aid many researchers and library users. Tilvawala et al (2009: 211-225) adds that the wealth of information has led to information overload among students especially those doing research as well as academic staff. This the author attributes to the transfer of traditional print to electronic information modules which easily overwhelm a user. Across libraries in institutions of learning in Kenya the authors argue, the use of ICT, information literacy, creation of online discussion groups and collaboration amongst library staff of different institutions has been key in tackling information explosion.

1.1.1 Context of the study

The JKML is the main library at the University of Nairobi (University of Nairobi Library, 2017). It was established in the year 1985 in a bid to expand the then Gandhi Memorial Library. It is located at the University of Nairobi main campus, Kenya. The library serves students, and other academicians in the fields of social sciences, humanities, architecture, and engineering. JKML has a capacity of about 2,500 users at a time (JKML, 2018). It has a total of 160 library staff that provides library services to the ever-growing population of students at the university. The objective of the university is to be a world-class information center specialized in the dissemination of the right information, provision of information as well as the preservation of knowledge (UON profile: background, 2017).

The JKML provides several services to the public: reading space, reference, and research materials. The digital content is also provided in addition to photocopying and printing. The administrative office within the library offers central services including acquisitions, cataloging of

research materials, coordination of functions, archiving as well as bindery of books. The library system at the University of Nairobi has a total of about 500,000 volumes which include books, print, and non-print materials as well as periodicals. Library resources are categorized into lending materials and specialized research collections which adhere to the Library of Congress Classification Scheme. The library has an e-resource section that aids in accessing and disseminating information. With the increased access to digital information, it is likely to contribute to information overload (JKML, 2018).

1.2 Statement of the Research Problem

A remarkable upsurge in the quantity of information available to library users in libraries across the world has been experienced in the 21st century. With this increase, many information users have found themselves at crossroads on what information is authentic, which one to ignore and which one is relevant. (Mostak, 2014:56) argues that information overload has negatively affected the expected users of the information. This study is therefore essential to information managers as it will inform them of the best practices to engage in, to manage information explosion in academic libraries for their users. Various countries, institutions and academic libraries across the world face the challenge of information explosion.

Rexwhite & Ocholla (2017: 23) posits that information explosion has made it difficult for information users to select and retrieve the requisite information. The importance of accessible, relevant and available information cannot be overemphasized. The last five decades has experienced an explosion of information leading to information explosion. Information explosion has been attributed to advancement in digital technology, which has contributed to an increase in

electronic books and materials. Several publishing firms have also lowered their prices, and this has encouraged publishers and writers alike to publish more work each passing day.

The magnitude of information that is becoming available in academic libraries today has become unsettling for both users and managers. With the latest advancements in IT, the information is easily created and distributed in real time leading to information explosion. Whereas technology has made it easier for users and library managers to access information, they are being overwhelmed by its abundance which has made it more difficult for users. Users are having a difficult time choosing the information source which is relevant and authentic. For libraries to remain relevant, we need to bridge the gap between information users and the available information resources. Information managers are therefore called upon to come up with views that can be used to mitigate information explosion.

The University of Nairobi having a big number of students increases the number of users also. With the current generation of students, most of them would not like to spend most time on the shelves of the library trying to get a book. Neither will they spend some more time in the resource center to access and retrieve relevant information. It calls for information managers to come in and make it easier for the users to access information faster. This is the problem that the study was focused on to explore the role of librarians in mitigating information explosion in academic libraries.

1.3 Purpose of the Study

The purpose of the study was to investigate the role of librarians in mitigating information explosion in academic libraries in Kenya, a case study of the University of Nairobi Library.

1.3.1 Objectives of the Study are to:

1. Examine the awareness levels of information explosion among the library users at JKML.
2. Establish the effects of information explosion amongst the library users.
3. Assess information searching skills of the users at JKML.
4. Propose appropriate strategies for mitigating information explosion.

1.4 Research Questions

1. What is the awareness level of information explosion among library users at the JKML Library?
2. What are the effects of information explosion amongst library users at the JKML Library?
3. What are the information searching skills of library users at the JKML Library?
4. What are the appropriate strategies for mitigating information explosion?

1.5 Assumption of the Study

The study assumes that information explosion is one of the challenges that hinder library users from accessing the relevant information available.

1.6 Justification of the Study

The findings and recommendations of this study will help various stakeholders to adopt better effective interventions on managing information explosion. Moreover, it will help library managers to leverage best practices and policies, which will govern how information is accessed, disseminated and conserved. It will also guide the library managers on the adoption of policies aimed at effectively integrating information technology. It will aid the University of Nairobi in adopting courses aimed at leveraging knowledge in programming and web design to manage information explosion. It will guide the universities on the areas, which need funding to mitigate the challenges of availability of information as well as cost.

The researches will in a big way assist library users acquire basic searching skills that will enable them make good use of the available information and access authentic information beyond the library walls. Finally, the research findings will form a basis for further research in similar or related fields.

1.7 Significance of the Study

A remarkable upsurge in the quantity of information available to library users in libraries across the world has been experienced in the 21st century. With this increase, many information users have found themselves at crossroads on what information is authentic, which one to ignore and which one is relevant. (Mostak, 2014:56) argues that information overload has negatively affected the expected users of the information. This study is therefore essential to information managers, as it will inform them of the best practices to engage in, to manage information explosion in academic libraries for their users. Various countries, institutions and academic libraries across the world face the challenge of information explosion. The state of information explosion in

developing countries and particularly from African countries has received little academic research focus.

This study is therefore important, as it will provide literature and findings from an African perspective. According to (Blummer 2014:116), there has been concern that information explosion in academic libraries is likely to have adverse effects on library users. He argues that the coping mechanism for users and managers is not systematic because there is little empirical research on the issue of information explosion from a library science discipline. The author says much literature and research on information explosion comes from other disciplines and fields including clinical psychology and philosophy.

1.8 Scope and Limitations of the Study

1.8.1 Scope of the Study

This study was limited to the Jomo Kenyatta Memorial Library, one of the libraries in the University of Nairobi, the study target critical users of the library including the information science masters' students, law students and library managers. The study explored the management of information explosion in academic libraries in Kenya, and provided possible solutions to information users on the information explosion error.

1.8.2 Limitations of the Study

One of the limitations the study encountered is the challenge of time for the library managers to participate in research due to the time constraints of privacy concerns. The study largely depended on the honesty of respondents from whom data was collected. Some respondents were not cooperative leading to time wastage. The study area entailed revealing sensitive information that requires substantial levels of confidentiality.

1.9 Operational Terms and Concepts

Data Mining: The term refers to a process of extracting meaningful data from large volumes of data to identify patterns and relationships with the objective of providing solutions to specific problems or predicting outcomes.

Information: This refers to collection of data, facts and ideas which have been communicated, interpreted, published and distributed formally or informally in any format.

Information explosion: According to Blackford, (2012: 7), information explosion can be viewed as a sudden increase of knowledge or overabundance of information, communicated or received concerning a particular fact or circumstances.

Information overload: This term used in this study to refer to the difficulty/challenge a library user encounters when faced with too much information from which to go through and make a decision about an issue under consideration.

Knowledge: In this study, the term knowledge was used to mean information that has been organized or summarized to enhance understanding.

Knowledge management: According to this study, KM refers to the process or practice of creating, acquiring, capturing, and making information available to users to enable learning/research as well as create ease in access of information.

Library: The dictionary of library science defines a library as a place where both print and non-print books are kept and can be borrowed. It is also a collection of materials that are organized and stored for use by the potential clients.

Mitigation: A according to the study, mitigation is to reduce the negative effects that are caused by information explosion.

1.10 Chapter Summary

This chapter introduced the information explosion as an emerging trend in accessing information resources. Further, the case study was introduced as well as the objectives of the study and the research questions with the aim of introducing to the reader information explosion in academic libraries.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0 Introduction

This chapter is a review of the available literature on the information explosion and its implication to users, referencing library resources, cataloging of library materials and intervention strategies which have worked. The literature review shows the research gaps that were explored by the researcher.

2.1 Awareness Levels of Information Explosion on Library Users

Search engines such as Google, Google Scholar and timeline from social networks provide a huge amount of search results around the globe and leaves users at a state of sampling a few accessible perceived correct ones; leaving out what could be most relevant. Given that we also have more print sources available like journals, books, newspapers this can also confuse users. However, In the recent past, the rapid increase of information and information sources have led to information explosion that renders users overpowered and frustrated; and hence the need for specialized skills to have access to and utilize information, Amunga (2011:429).

As stated in Nyatangi 2011:21, Ruff (2002) asserts that users have developed strategies such as: creating a personalized system for storage and retrieval of information; for example, use of a notebook, a planner, filing system and organizing email system, time management training, business and academic writing training. In addition, users utilize software technology training and computer literacy as a preventive strategy to help them in dealing with information explosion. The author further noted that people could also shift attention to what they prefer to be most useful and essential information while purposively neglecting other sources. Similarly, people could use to

multitask or eliminate disturbances psychologically and physically from outside by not picking calls or by closing the door. On the other hand, Badke (2010) asserts that the digital natives have learnt how to deal with the masses of data simply by choosing what is easiest and convenient to access while abandoning the rest. Although, there could be better data deeper in the pile, it could be difficult to sift through it in search of it without getting fatigued. If the easily accessible seems to solve users' problem, then it good, hence bidding goodbye to information overabundance (Badke 2010).

2.2 Causes of Information Explosion and Its Effects on Library Users

Libraries have experienced significant transformation from the early libraries to the 21st-century modern libraries. Acquisition of timely, up-to-date and adequate information is indispensable in the 21st century. Corporate and individuals require information to make informed decisions (Giamfi, (2019: 214). The need for more information has made lecturers and other scholars in higher institutions of learning to stay abreast with discoveries in their specific areas of specialization. The academic lecturers have a massive task of researching content for lecturing purposes. The learners also need information, in their insatiable quest for academic excellence. The amount of information required has remained a challenge to universities and other institutions of higher learning and this has led to digital technologies increasingly being accepted (Elisha, 2017:65).

Hoq (2014:11), correlates the advent and constant development of technology to information overload. The implication of information overload is that users of information are having difficulties choosing reliable and authentic sources. For example, a researcher looking for information on a particular topic will read one of the articles or books and leave thousands of other

books exploring similar subject matter. Library departments such as acquisition face challenges of identifying appropriate information materials for their users, whereas the cataloging section experiences challenges in the classification of information materials, and reference services are becoming much overloaded with duplicated information, (Mostak,2014:55).

The advancement in the development of information communication technology has played a role in the generation and dissemination of information. According to (Farhoomand & Drury 2014), the quantity of new information and the rate at which such information is being generated is such that no person can keep pace. Academic libraries are places where print and non-print information is maintained and can be borrowed. The collection of these materials are secured, organized and stored for use by potential clients (IJLA, 2014).

Academic libraries are facing one of the 21st-century realities; information explosion. As cited by (Kadiri and Adetoro 2012), information explosion is a situation characterized by an upsurge in the quantity of information being published and its effects. This provides library managers with an uphill task of ensuring that the users of the library information are not inundated by the overabundance of information which may not be relevant. Library information users and managers are exposed to information overload which is affecting their capacity to manage it effectively. The ease with which one locates information, analyze and utilize it determines the success of the research.

On the other hand, (Hoq 2014) attributes information explosion to advancement in information technology. In recent times, the advancement in technology also contributed to the information explosion and overload. The demand for information increased during the 'Age of Reasoning and Enlightenment' where the large volumes of literature were generated and disseminated all over the world. The onset of the 'information age' in the 20th century contributed to increased

access to information published by researchers. The use of computers and computer networks made work easier through manipulation of data.

(Dutta 2011) posits that the usage of high-speed computers with large storage capacities at low cost has led to the accumulation of information. He attributes the enhanced creation, storage, and dissemination of information to the advancement in the technology. In the year 2003, about 800 megabytes of data were produced daily. This increased to 800 billion gigabytes in the year 2009 which further grew to 1.2 billion megabytes of information. This growth is expected to hit a record high of 35 billion megabytes of information (Dutta, 2011). To the information managers, there is a challenge on how to effectively select relevant information, sort and catalog as well as classify information from vast library resources at their disposal. The study will, therefore, seek to explore the roots of information explosion in academic libraries in Kenya.

2.3 Information Explosion and User Effects

Academic libraries are coping with the challenges emerging due to digital technologies, by acquiring, processing and packaging the same information for the purposes of consumption by library users. However, the biggest challenge to librarians is the various sources of information that exist and need effective management. Consequently, librarians have to liaise with aggregators and publishers either locally since e-learning is taking shape at a very advanced speed with the e-learning tools such as simulations and platforms for hosting eBooks. Advancement in information technology (IT) has contributed to a new reality in the 21st century, which is information explosion (Ifijeh, 2010:15).

Information users in institutions of higher learning face an uphill task of not only locating the right information but also choosing what is authentic and relevant for their studies. This makes the users

looking for such information to be fatigued and anxious. According to (Mostak 2014), the information explosion contributes to fatigue and exhaustion. As a response, library information users often respond through information avoidance hence making them miss important information they are looking for.

Another effect of information explosion is the increased tendency to downright becoming addicted to electronic sources (internet) for research. Users who are addicted to the internet for research have been found out to be less productive especially in situations where library information managers enforce spamming policies. Information overload can also contribute to reduced levels of content retention because information is obtained in real time and from varied sources. Besides, the diverse sources may include uncensored ones who could provide information which is not authentic.

According to (Hallowell 2010), information explosion and overload have health effects on users. One such effect is the attention deficit trait (ADT), a neurological health effect characterized by impatience, confusion and perversion. Moreover, information overload as cited by Wurman (1989) has a strong correlation with incidences of cardiovascular stress and decreased vision. According to (Kadiri and Adetoro 2012), a person with such attention deficit traits tends to be less organized, unable to set priorities right and time unconscious. Winkle also found out that information explosion and overload contributed to bad judgment and information anxiety. Literature review on the positive effects of information overload on the academic world and environment is however limited. This study will explore the positive impact of information explosion on library information users.

2.4 Information Searching Skills

Etsua-Mensar, (1999:21) attributes information overload to the increasing number of publishers and several published information available. (Wilson 2002:17) further traces the origin of information overload to the 17th and 19th century where information emerged a critical component to all human activities at the time. He further asserts that the cost of acquiring information has significantly contributed to the information explosion. The number of scientific journals continues to grow exponentially adding to the vast knowledge available to researchers.

Many academic libraries provide face to face orientation to users on how to search data through databases and literature, and in most cases the librarians do it on behalf of clients in return, hence the library users may not be able to do the search themselves unless the information managers get used to training users on how to filter information to avoid humorous results.

Many academic libraries have tried to curb this menace (information overload) through programs such as information literacy to its users and also user orientation especially to the new students. Some other libraries have sought a realistic solution to information overload by covering only the basics. “Let people live in their narrowed-down world using Google or Google Scholar plus all manner of social media, but teach them how to use these tools with more skill. If they want to use library catalogs and more complex journal databases, teach them how to use these tools simply” (Badke 2010).

Academic libraries have also made strides by integrating content into workflow and enabling remote access so that users accessing the library resources from anywhere are able access the information they need, retrieve and use at any time they wish. In addition, there has been sharing of knowledge through social media whereby academic libraries have opened accounts in the social networks for a more interactive form with its clients such as reference services. This paper is an

attempt to analyze the results on the effects of information skills training on future user behavior. A productive training services aim to equip users to conduct professional literature searches on their own works, hence helping the trained users to be independent on future searches. (Israel, 2017: 12).

2.4.1 Referencing of Library Services

The 21st century has experienced an increased availability of published and non-published information from individuals and institutions. According to Wellmon (2015:353), the overabundance of data has made it difficult for information users and scholars to access the authentic and right information due to information explosion, which is an overabundance of information. Academic libraries provide a reference desk where professional librarians serve its users with direction on where to find library resources they need. The reference desk also provides library services and collections with information and expertise on where to obtain certain sources of information. According to (Lawal 2002), information desks are essentially serving as a link between the library and its users. The assistance and direction provided by referencing desks enable users to exploit information effectively.

The librarian has evolved from just maintaining order and cleanliness in a library to becoming an information scientist who (Katz, 2002). Providing the right answers, however, remains a challenge in the 21st century because of the challenge of getting a specific piece of information among an avalanche of undifferentiated information. With the availability of different media and multiple sources of information in different formats, this study will explore the existing gap on the extent to which information explosion impacts on the cataloging of information.

2.5 Intervention Strategies to Mitigate Information Explosion

2.5.1 Library Staff

A librarian is a key stakeholder when it comes to the effective provision of library services. However, their role has not changed much in public libraries; they are mainly locators of information (Hoq, 2014). With the advancement in technology experienced in recent times, there is a need for librarians to be active in evaluating library information and analyzing it. There is a need for them to transition from giving direction on the location of information to evaluating library information received. (ALA 2004) suggests the need for a change of roles of the librarians to work closely with users in service provision.

According to (Koltay 2017), it is important for librarians to have information literacy. This is important because it enables them to handle overabundant information effectively. As cited by (Hog 2014), librarians not only need to have the capacity to locate and critically evaluate sources of information but also to use it effectively when needed. Information literacy will enable librarians to solve information overload challenges. According to (Onwubiko 2006), the era of active librarianship requires a transition from traditional to 21st-century approaches to the provision of library services. He further posits that a librarian should strive to acquire new professional and academic credentials and be skilled in the provision of credible library services.

2.5.2 Information Communication Technology

Information and communication technology (ICT) is equally important in solving the challenge of information overload. Whereas ICT is viewed as one of the causes of information overabundance, some people view it as the solution to the challenge. The librarian needs the skills on how to optimize searches and help users on how to retrieve relevant information they need. According to

(Sajja & Akerkar 2016), there is a need for information managers to integrate tools such as intelligent agents, data mining, ranking, and personalization algorithms to tackle information overload. Library managers need ICT skills to enable them to consolidate their positions as information evaluators. ICT can acquire electronic information easier hence helping in solving the storage of hard copies problem. Research shows that ICT is capital intensive and requires trained personnel to install and maintain in a library. Many studies are based on the challenges faced by libraries on the utilization of information technology. This study will explore the role of ICT as an intervention strategy best suited to mitigate consequences of information explosion, (Ridwan, 2015:3).

2.6 Knowledge Gap

From the literature review, information explosion continues to be an uphill task for all information providers as well as knowledge seekers. Blummer (2014:116) says that, there has been concern that information explosion in academic libraries is likely to have adverse effects on library users. He argues that the coping mechanism for users and managers is not systematic because there is little empirical research on the issue of information explosion from a library science discipline. The author says much literature and research on information explosion comes from other disciplines and fields including clinical psychology and philosophy. This implies that there is a gap in defining the role of librarian in mitigating information explosion in the field of information science.

2.7 Theoretical Framework

2.7.1 Cognitive Model

Cognitive model is a descriptive account of human thinking about a certain given concept. It explains the mental processes and show how they produce permanent changes in memory of learners. This study used the cognitive model to demystify the relationship between the variables under study and also the study wanted to relate this with how library users process information. The cognitive model was introduced in the 1950s to explain various discourses in the information and library sciences. The theory was developed by Albert Ellis who sought to explain how the brain processes and stores information. His postulation was supported by G. A Muller whose research found out that working memory was limited.

Albert Ellis argues as follows:

- It is anchored on the disciplines of library science, human-computer interaction, and cognitive science.
- That there is a relationship between a user's perception of the information being sought and the arrangement of this information as contained in an information system (Bates 2005:24).
- The user-friendly approach in the designing of information databases helps users to quickly locate relevant information and whenever needed.

According to (Ellis 1992:53), the cognitive model is based on the assumption that retrieval of information from a database or anywhere where it is stored must and should operate within the intellectual capacity of the user. To achieve this, he calls for inclusion of different and varied multiple tasks, issues and problems in the database as different users have different ways of

searching for this information and likewise, expect the information they seek to be in various forms. Ellis advocates for system-wide and continuous improvements to information databases from simple adjustments like the improvement of search results to complex one such as the creation of a database that users can query using natural language during the search for information.

2.8 Conceptual Framework

A conceptual framework is a demonstration of what is expected to be found out after a research has been carried out. It defines the independent variables, dependent variables, the outcome of the research and shows out how they are related to each other.

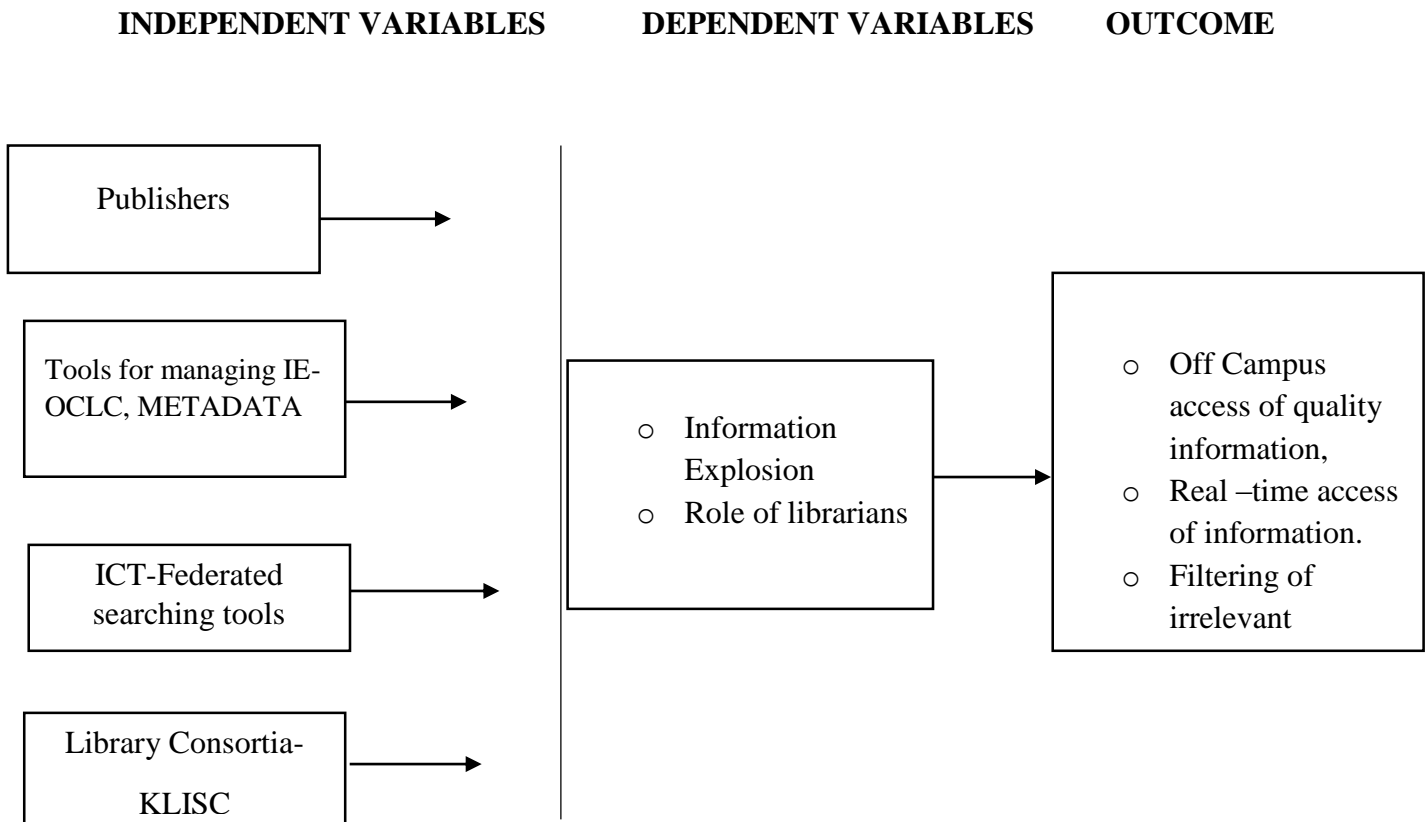


Figure 2.1: Conceptual framework

Source: Researcher (2020)

2.9 Chapter Summary

This chapter discussed in the literature reviewed the mitigation of information explosion in libraries in relation to the various arguments by scholars. Further, detailed information is given in line with the objectives and research questions of the study. The chapter also demonstrates the need to mitigate information explosion in libraries for easy access to relevant information by library users. The literature review revealed that there are various tools and methods that can be used to mitigate information explosion. It is clear that collaboration with publishers will lead to selection of relevant information resources. Management of information using ICT tools such as federated searching engines will facilitate efficient and effective information. Moreover, library consortiums will lead to access to affordable information resources.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

In this chapter, the methodology and research design which was applied in the study is discussed. These include: the research design, area of study, target population, sample strategies, sampling techniques, data collection, validity and reliability of research instruments, data analysis and data presentation and ethical issues in data collection.

Research methodology is defined as the science of finding out; the process of collecting information or data to draw inferences (Babbie, 2015:6). Methodology gives the reader all the tools they need to understand the research since it explains in detail how the research was conducted (Clough & Brown, 2012). It can also be used to capture the respondents 'subconscious' views on a topic hence making it more important to choose and expound more on research methodology in research. (Massingham, 2012:70).

3.1 Research Design

This is a scientific method of education where a researcher observes and describes what he or she sees or feels or hears. The data collected was analyzed through qualitative and quantitative methods. This was the most appropriate design for this study because of its mutual benefits. A qualitative approach helped the researcher to explore and understand how respondents attach meaning to the social problems through the face to face interviews whereas quantitative method was used to test the objectives of the research by examining the relationship among variables through a questionnaire (Creswell 2014:4). This study employed a descriptive research design which was relevant aiming at presenting the views and opinions. The descriptive design was best suited in answering questions of "how and why." The study also used a case study research design.

The University of Nairobi main library was used as the case in examining the implications of information explosion and its findings used to generalize for academic libraries.

3.2 Area of Study

The area of research was the University of Nairobi's main library (Jomo Kenyatta Memorial Library-JKML). This is because it has a broader scope and an adequate number of information managers and library users that can allow the researcher to collect extensive data about the problem.

3.3 Target Population

Sekaran and Bougie (2016), defines a target population as a sum of individuals and objects that the researcher is interested in studying either as a group or as individuals with characteristics that are similar. In this study, the target population was a particular group of people that were identified by the researcher as the intended recipient of the study that included two categories of respondents: information managers'/library staffs from the six sections that make up the UoN JKML Library. The target population included respondents from the circulation section, cataloging, acquisition, e-resources, repository/ICT and graduate research library; and masters' students from department of library and information science and school of law. A Sample size of 13 library staff members were purposely selected on merit out of the available 62 library staff. The selected staffs were believed to provide relevant information regarding information explosion. A census method was used to select masters' students from school of Law and Masters of library and information science. Census method was preferred because it provides adequate information about the whole population. The masters' students were believed to provide comprehensive information regarding the role of librarians in mitigating information explosion as they are perceived to be more serious

in their studies as compared to undergraduate students. The sample size was selected from 3 categories as indicated in **Table 3.1 below.**

Table 3.1: sample frame

No.	Respondents	Population Size	Sample Size
1	Library staff	62	13
2	Master students (MLIS)	25	25
3	Masters students (LAW)	170	170
	Total	257	208

3.4 Sampling Strategies and Techniques

Sampling involves selecting a representative section of the population and using them to collect data, which will be used for research information.

3.4.1 Sampling Strategies

The study utilized both probability sampling and non-probability sampling strategies. Probability sampling was used to select the school of Law and departments of library from all the other schools and departments of the university of Nairobi. The department of library students was selected because they possess firsthand experience on information explosion while students from the school of Law are believed to carry out studies utilizing the library all through their studies. Non-probability sampling was used to select the University of Nairobi and library staff from the six

sections of the JKML library. The method was used reduce the sampling biasness make it easier in selecting respondents.

3.4.2 Sampling Techniques

Purposive sampling was used by the researcher in selecting University of Nairobi because of its varsity student population and choosing respondents from each of the six sections of the University of Nairobi JKLM library: circulation, cataloging, acquisition, e-resources, digital content, and graduate research. This reduced the degree of error in the sample. The study also used Census method to select masters' students from the School of law and department of library and information science because the researcher needed to collect comprehensive and complete information from the entire group. Census population was also manageable and that all the respondents were given an equal opportunity to respond to questions.

3.5 Data Collection Methods

The study collected both qualitative and quantitative data utilizing questionnaires and face to face interviews.

3.5.1 Questionnaires

According to Sekaran and Bougie (2016:144) questionnaires are designed to collect qualitative and quantitative data. It is a tool for collecting and recording data that is collected during a survey. This was used to collect quantitative and qualitative data from various information managers about particular issues of interest. A questionnaire will always have a defined subject in relation to the objectives of the research, the questionnaire ought to be so clear from the beginning outlining on how the findings will be utilized. The respondents also need to be informed of the purpose of the research where possible (Schaefer 2017). Therefore, the researcher applied both open ended

questionnaire and closed ended questionnaires and found this instrument appropriate due to the following reasons; respondents had sufficient time to reason and think through the questions and give good response without biasness; there is convenience in approaching respondents who are not easily approachable and also a substantial quantity of respondents who could be reached within less time. Using this method also made it more reliable and dependable.

3.5.2 Interview Schedule

An interview according to Creswell (2012) interview schedule is the preferred form of data collection when conducting a qualitative research. This is due to its framework whereby the practices and standards are neither recorded for that matter, but as well as achieved, challenged and reinforced. An interview is a conversation which is involved between an interviewee and an interviewer with an aim of the interviewee achieving his objectives to base his questions from. The researcher however used the face to face interview method targeting library staff because of its advantages over telephone interviews. The researcher used a structured interview with open-ended questions to collect data. Out of a total of 4 top managers, the researcher purposely selected 1 top manager and 4 senior Librarians from 10 were also purposively selected for the interview. The other staff members were also purposively selected from the six departments. The interview was well transcribed to avoid omitting important information.

3.6 Research Instruments

3.6.1 Pilot Study

Research instruments are important in ensuring that data collected is valid and reliable which is a measure of ensuring validity and reliability in research work (Bryman,2012:106). The developed questionnaire was checked for its validity and reliability through pilot testing which was conducted

to detect any weakness in design of the data collection instruments for the study. The study subjected the questionnaires to 15 library users of the actual size and 3 Library staff all from Kenyatta university post-modern library. Findings from the pilot test compelled the research to restructure a few of questions so that they could reflect better the objectives of the study and eliminate the problems during data analysis. The researcher chose this library because the environment is similar and the population of both libraries is large with similar characteristics.

3.6.2 Validity

The views from the pilot study were used to test for validity as well as reliability of the research instruments. Validity of an instrument indicates how well your findings will represent the phenomena under study. Conversely, reliability of the research instrument will help to measure consistency in the results obtained for the study.

Validity in qualitative research is the extent to which results obtained from the analysis of data represents the phenomena being studied (Leung 2015:325). It is the appropriateness of the process, tools used, and data collected, toward ensuring the accuracy of the research findings.

After administering the analysis instruments, knowledgeable opinions from my supervisor and alternative linguistic analysis professionals were used to evaluate the content validity of the instruments used. Moreover, the researcher conducted a pilot study was done at the Kenyatta university post-modern library to determine content validity.

3.6.3 Reliability

Noble and Smith (2015:34) states that, to judge the dependability or reliability of a study findings needs the researcher to check the accuracy of the analysis in regard to the appliance and suitability of the methods used and therefore honesty of the ultimate conclusions. Reliability is the measure

of the extent to which the analysis instruments generate compatible results of the data once the perennial trials are done. The researcher carried out a pre-test study employing a clearly defined questionnaire to judge the relevance of the instruments used. The dissatisfactory analysis instrument items were either redrafted to boost the standard of the analysis instruments.

3.7 Ethical Considerations

The researcher got permission from the department of library and information science at the university before going to the field for data collection. In reference to Koltay (2017), the matters to do with discretion and privacy must be considered intensely during the investigation. The researcher got prior consent from the participants before proceeding with the data collection. The researcher had to put this into consideration by getting permission and was guided by the principle of informed consent from the participants of the research study. The researcher assured the respondents on confidentiality and highest privacy of the information provided by the respondents. The researcher also ensured that the respondents participated voluntarily with free will in the investigations. The researcher as well committed to submit all her findings on this research topic to a plagiarism check to ensure that the work passed the originality test giving credit to all supporting works by other authors.

3.8 Data Analysis and Presentation

Kombo (2006) gave a definition of data analysis referring it as the process of examining, inspecting and transforming the data collected in a research aiming at informing conclusions and supporting decision making. The study made use of both qualitative data using interviews and quantitative data using the questionnaires. The quantitative data from the collected data was coded and analyzed using descriptive statistics including frequencies and percentages. On the other hand, the

qualitative data was analyzed by use of content analysis. Descriptive statistics was the best in this study since it entailed the analysis, description and interpretation of the phenomena under study. Data was then interpreted and presented information of tables, figures, charts, graphs and pie-charts.

3.9 Chapter Summary

This chapter introduced the research methodology that was used, target population and the sample size of the study, research design, population under study, sampling, data collection and discussed also on the validity of the instruments used in relation to the reliability of data that was collected. The chapter discussed how the study was conducted elaborating on the research tools that were used for the purpose of this study.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0. Introduction

This chapter shows, presents, analyses, interprets and discusses the data collected from the research study based on the objectives and research questions which include to: examine awareness levels of information explosion among the library users at JKML, establish the effects of information explosion amongst the library users, assess information searching skills of the users at JKML, propose appropriate strategies for mitigating information explosion. The study was carried out on a sample size of 208 respondents out of which 13 were library staff and 195 were Masters Students from the department of Library Information Science and school of law. All of the 13 library staff was available for the face to face interviews. Out of the 195 questionnaires given out to the masters respondents, 117 were filled and returned making giving it a 60% response rate. According to (Mugenda and Mugenda: 2012) a response of above 50% and above is good for statistical reporting. Multiple response questions were analyzed using Likert scale. The scale was used to collect and analyze the quantitative data whereby the scale of points was used in computing the means and percentages. Therefore, the results were presented in tables and charts with explanations given in prose. Open ended questions, interviews and participant observation were used to collect qualitative data, which was analyzed and presented in prose.

4.1 Response Rate of Respondents

The target population was 257 respondents of whom 195 were master's students, 62 library staff. From the sample population, 195 questionnaires were used on students' respondents whereby 117(60%), while all the targeted 13 (100%) library staff were interviewed using an interview schedule. The information professionals that were targeted at the interview at JKML helped the researcher achieve their objective by using purposive sampling technique to obtain greater depth of information management in the library. The overall response rate was 63%. Combining the response rate of both qualitative and quantitative data collection, this was considered a fairly high response rate that is adequate for a research of this magnitude. The rate of response is demonstrated in the below table 4.1.

Table 4.1: Response rate

RESPONDENTS	ADMINISTERED	RETURNED	PERCENT
Staff	13	13	100%
Students	195	117	60%
Total	208	130	63%

4.2 Responses on Demographic Information

It is important in the study to find out the respondent's background information. The study generated general information on respondent's gender, age and user category. This was very important for the validation. The responses which helped the researcher to understand from which level of experience the respondents answered questions.

4.2.1 Gender Distribution

Majority of the respondents in the study were female. From the total number of respondents, male respondents were 48% while female respondents were 52% as shown in Figure 4.1 below.

From Figure 4.1 below, it indicated that the majority of the respondents were female.

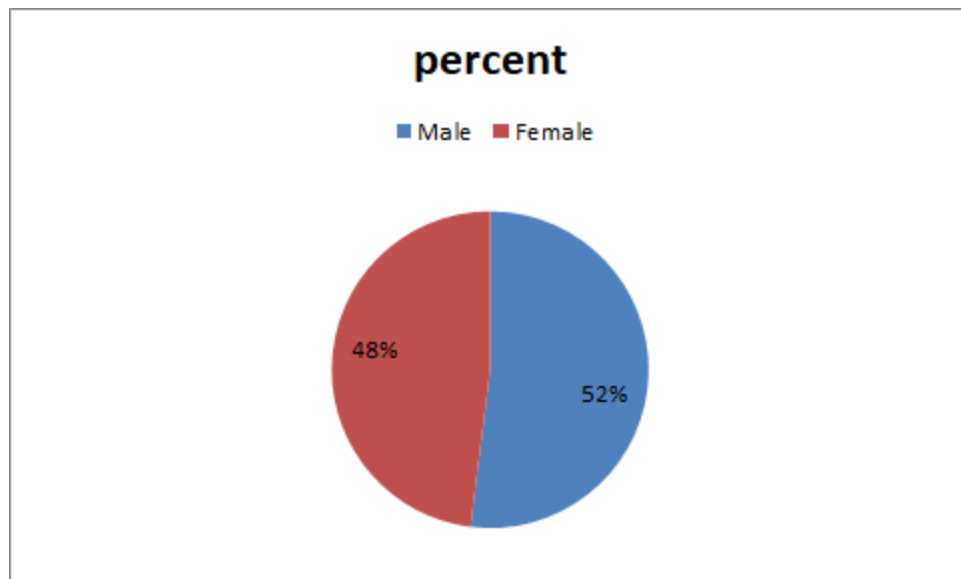


Figure 4.1: Respondents gender distribution Respondents

4.2.2 Age of the Respondents

The research examined the age bracket of the respondents with a view of seeking to establish the kind of users with regards to information explosion and also to establish the kind of users who are currently affected by information explosion. Figure 4.2 shows that the age brackets of 51 years and above had (12%), while 41-50 years was (29%), 31-40 years had (53%) and 20-30 years had (6%). This revealed that students between 31-40 years formed the majority of postgraduate students which could be attributed to the fact that most of them have just graduated and got

employment and wanted to further their studies. From the study, (41-50) and (50 years and above), were both at 29 and 12% respectively this could mean that they could be probably nearing the mandatory retirement age leading to fewer students in the bracket, while students between 20-30 were the least in percentage and this could be due to the fact that majority have either enrolled for diplomas or undergraduate in the same institution or others.

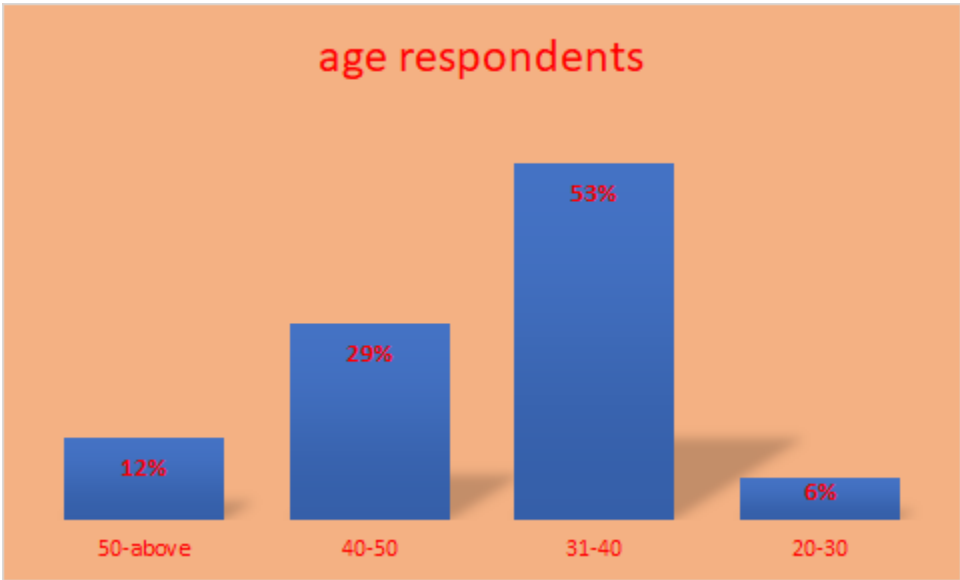


Figure 4.2: Age Bracket

4.2.3 User Category

The category of the respondents was based on library staff and Postgraduate students in MLIS and School of Law. This category of users was important since they are the users with firsthand experience with the challenges of information explosion and thereby are in a position to provide the required information. Figure 4.3 shows the majority of the user category were library staff at (34%) and MLIS students at (38%) while Law students were at (28%).

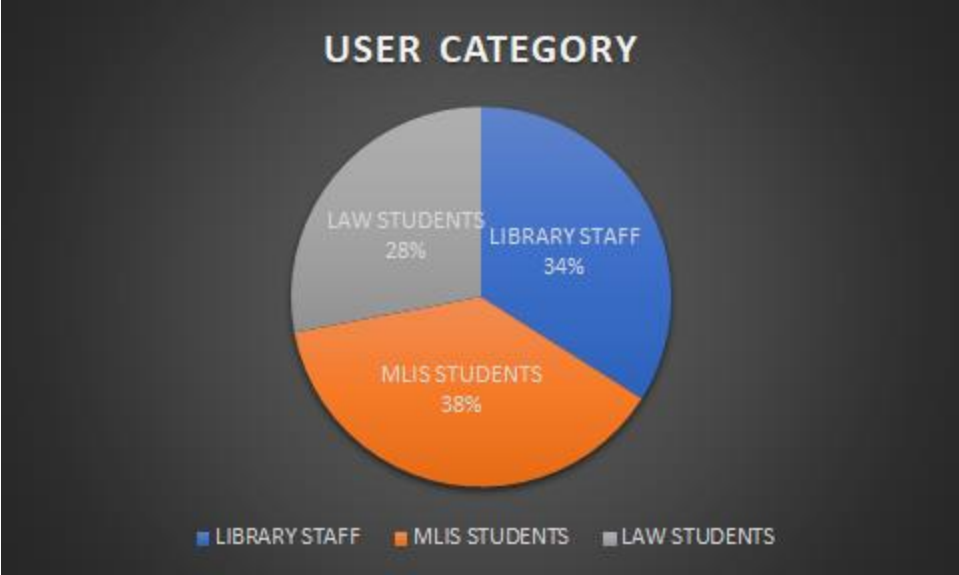


Figure 4.3: User Category

4.3 Awareness of Information Explosion

The study also established whether the respondents were aware of information explosion and how it affects them. This was analyzed in two scenarios, the first one being the awareness and the second part of the question whether the respondents were affected negatively. Figure 4.4 below indicates that (59%) were aware of what information explosion is all about while (40%) were not aware and (1%) never provided any response to this aspect. This indicates that most of the respondents clearly understood what information explosion is and knew the extent to which they are affected, but they did not understand what it is.



Figure 4.4: Awareness of Information Explosion

4.4 Negative Effect of Information Explosion

The research was to find out the negative effects of information explosion on the available materials. Figure 4.5 below shows that (74%) indicated that information explosion had a negative effect on them while (26%) indicated that they never experienced negative effects of information explosion. The (74%) that indicated they were affected negatively means that they did not understand how to overcome the challenge of information explosion and hence needed guidance and training on information retrieval while the (26%) were able to overcome the challenge and were aware and experienced the positive effects of information explosion.

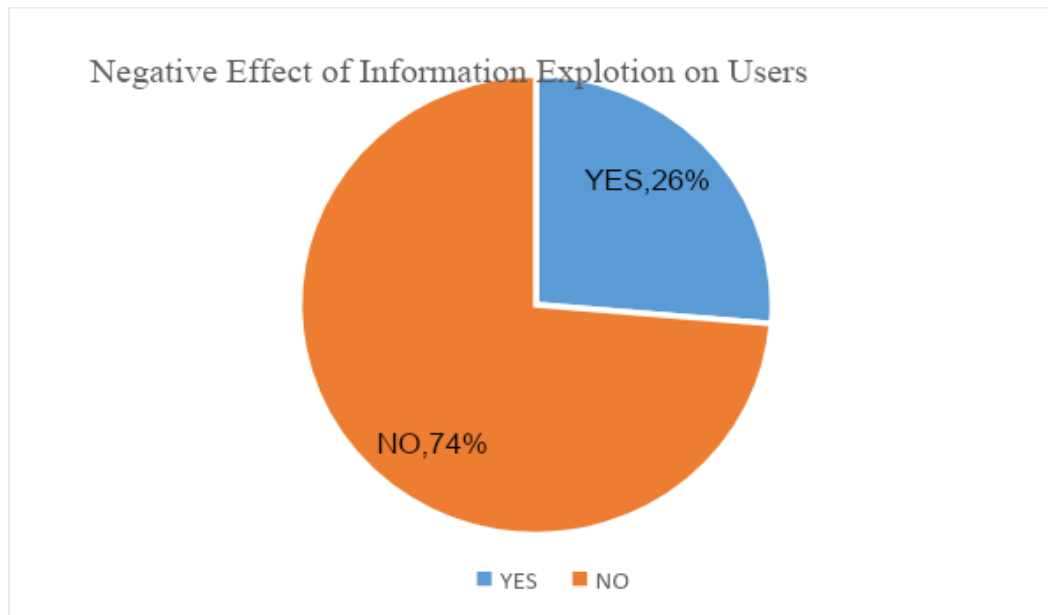


Figure 4.5: Negative Effect of Information Explosion

4.5 Types of Information Resources Used by Library Users

In order to measure the information explosion on library users and identify mitigating solutions and address the sources of information explosion, the researcher needed to know the types of information resources used by library users. From the figure below (37%) indicated that their sources of information were textbooks, 32% indicated journals as their main source of information, while (25%) used online resources and (6%) used others. The (37%) indicated that they largely depend on the hard copies in the library and did not explore more on the e-resources that the university library offers. The (32%) relied entirely on journals that were available; these means that they need to be trained and introduced to more resources that are available for research and information. (25%) indicate that they used online resources calling for training too and exploring more on other resources. However, the librarians suggested that most of the users requested for journals, followed by textbooks then online resources.

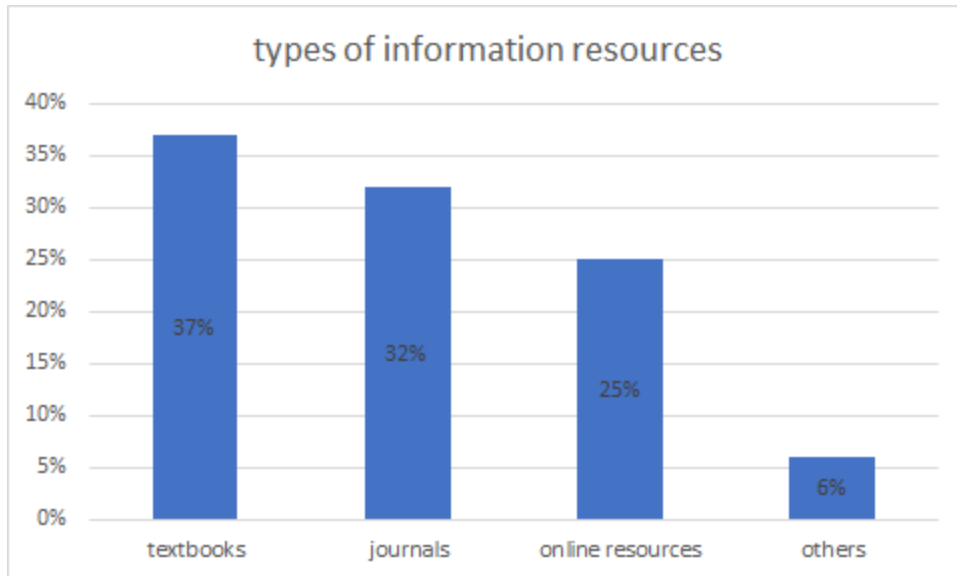


Figure 4: Types of Information Resources

4.6 Information Seeking Sources

With regards to information seeking behavior and sources the study sought to analyze the various sources that the respondents used to get access to information in order to attend their individual and group assignments, continuous assessment test, main exam and research project. From the table below the frequency on lecturers as source of information was (14%) for not at all, (20%) to a small extent, (12%) relied on lecturers moderately, (14%) relied on lecturers on a great extent and (40%) to a very great extent as shown in Table 4.2 below.

Table 4.2: Information Seeking Sources

	FREQUENCY	PERCENT	VALID PERCENT
NOT AT ALL	17	14	14
SMALL EXTENT	23	20	20
MODERATE EXTENT	14	12	12
GREAT EXTENT	16	14	14
VERY GREAT EXTENT	47	40	40
TOTAL	117	100	100

4.6.1 Professional Colleagues

The researcher also wanted to understand how much the users relied on professional colleagues for information since we have so many ways of getting information, from the table below (14%) indicated that they never relied on their professional colleagues, (12%) relied on professional colleagues to a small extent, (28%) moderately, (25%) great extent, while (21%) to very great extent. Majority showing that they relied on professional colleagues to a moderate extent followed by great extent.

Table 4.3: Professional Colleagues

PROFESSIONAL COLLEAGUES			
	FREQUENCY	PERCENT	VALID PERCENT
NOT AT ALL	16	14	14
SMALL EXTENT	14	12	12
MODERATE EXTENT	33	28	28
GREAT EXTENT	29	25	25
VERY GREAT EXTENT	25	21	21
TOTAL	117	100	100

4.6.2 Official Publications

For the study to be accurate on its research, we needed also to understand whether users use the official publications while accessing information. The table below indicates that (20%) did not use the official publication at all, while (10%) used official publications to a small extent, (32%) on a moderate extent, (18%) at a great extent and (20%) at very great extent. This means that most of our library users use other publications that are not official to get information which can lead to getting wrong information and hence increase the chances of being affected by information explosion negatively.

Table 4.4: Official Publications

OFFICIAL PUBLICATIONS			
	FREQUENCY	PERCENT	VALID PERCENT
NOT AT ALL	23	20	20
SMALL EXTENT	12	10	10
MODERATE EXTENT	38	32	32
GREAT EXTENT	21	18	18
VERY GREAT EXTENT	23	20	20
TOTAL	117	100	100

4.6.3 Internet

The advancement in the development of ICT has a key role the generation and dissemination of knowledge. According to (Farhoomand & Drury 2014), the quantity of new information and the rate at which such information is being generated is such that no person can keep pace. For this the research had to get information from the respondents whether the statement above is true. In line with internet as a great contributor to information explosion, the respondents were requested to respond on the internet usage and the table shows that (7%) never used the internet, (9%) used the internet at a small extent, (15%) used the internet moderately, (24%) at a great extent, while (45%) at a very great extent. The ones that never used the internet could be the ones that relied on the books and lectures in getting information while the larger percentage of the library users relied on the internet to access information.

Table 4.5: Use of Internet

INTERNET			
	FREQUENCY	PERCENT	VALID PERCENT
NOT AT ALL	8	7	7
SMALL EXTENT	11	9	9
MODERATE EXTENT	17	15	15
GREAT EXTENT	28	24	24
VERY GREAT EXTENT	53	45	45
TOTAL	117	100	100

4.6.4 Library

There is much information available online and digital media replacing printed books (Zeldes, 2017). The study further sought to establish how the library was used to enable access to information. The Table 4.6 below indicates that (15%) of the respondents never used the library, 15%) to a small extent, (25%) moderately, (27%) at great extent (18%) at a very great extent. This indicated that the majority of the respondents (25% and 27%) used the library moderately and to a great extent.

Table 4.6: Library

LIBRARY		
	FREQUENCY	PERCENT
NOT AT ALL	18	15
SMALL EXTENT	17	15
MODERATE EXTENT	29	25
GREAT EXTENT	32	27
VERY GREAT EXTENT	21	18
TOTAL	117	100

4.7 Search Strategies

Various search strategies used by the respondents were analyzed with the aim of identifying the popular search strategy used to access information from various sources available for information. These included; Key word search, title word search, subject search and author search, browsing in repository and E-Resources.

4.7.1 Key Word Search

From the table below (5%) strongly disagreed the use of keyword search, (5%) disagreed, (11%) were neutral, (32%) agreed, (47%) strongly agreed. This shows that most of the respondents agreed to be using keyword search.

Table 4.7: Key word Search

KEY WORD SEARCH		
	FREQUENCY	PERCENT
Strongly disagree	6	5
DISAGREE	6	5
NEUTRAL	13	11
AGREE	37	32
STRONGLY AGREE	55	47
TOTAL	117	100

(Source: Researcher, 2020)

4.7.2 Title Search

The analysis below shows that (5%) strongly disagreed on the use of title search, (7%) disagreed, (11%) neutral, (23%) were in agreement and (54%) strongly agreed. From this study it shows that most of the respondents strongly agreed on using title search. From this, it can be said that most of the library users searched information using the titles.

Table 4.8: Title Search

TITLE SEARCH		
	FREQUENCY	PERCENT
STRONGLY DISAGREE	6	5
DISAGREE	8	7
NEUTRAL	13	11
AGREE	27	23
STRONGLY AGREE	63	54
TOTAL	117	100

4.7.3 Author Search

The research shows that according to search engines, Author search in the analysis below show that (14%) strongly disagreed on the use of author search, (15%) disagreed, (32%) were neutral, (18%) agreed while (21%) strongly agreed. This indicates that most users do not know the authors of information resources. The library staff respondents from the interview mostly pointed out that most users ask for assistance often when they do not know the authors. The staff respondents further add that users seemed not to know that they can as well use other terms to access information.

Table 4.9: Author Search

AUTHOR SEARCH		
	FREQUENCY	PERCENT
Strongly Disagree	16	14
Disagree	18	15
Neutral	37	32
Agree	21	18
Strongly Agree	25	21
TOTAL	117	100

4.7.4 Subject Search

From Table 4.10 below (9%) strongly disagreed on the use of subject search, (12%) disagreed, (11%) were neutral, (23%) agreed and (45%) strongly agreed. This indicates that the majority of the respondents used subject search as a skill to access information, a thought that the librarians also agreed to in the interview schedule.

Table 4.10: Subject Search

Subject Search		
	Frequency	Percent
Strongly Disagree	10	9
Disagree	14	12
Neutral	13	11
Agree	27	23
Strongly Agree	53	45
TOTAL	117	100

4.7.5 Browsing in Repository

The table below indicates that about (19%) of the respondents strongly disagreed on the use of repositories, (17%) disagreed, (20%) were neutral, (30%) agreed, (14%) strongly agreed. Majority of the respondents agreed to have browsed in the repository.

Table 4.11: Browsing in Repositories

Browsing In Repositories		
	Frequency	Percent
Strongly Disagree	22	19
Disagree	20	17
Neutral	23	20
Agree	36	30
Strongly Agree	16	14
TOTAL	117	100

4.7.6 E-Resources

Table 4.12 below shows that (22%) strongly disagreed on the use of e-resources, (11%) disagreed, (24%) were neutral, (28%) agreed and (15%) strongly agreed. The majority agreed to have used the E-resources available. Most of the librarians said that the e resources provided by the university are easily accessible if the users understand the searching skills.

Table 4.12: E-resources

E-resources		
	Frequency	Percent
Strongly Disagree	26	22
Disagree	13	11
Neutral	28	24
Agree	33	28
Strongly Agree	17	15
TOTAL	117	100

4.8 ICT Components

The researcher sought to know how the library users rated the ICT component importance in relation to the growth and expansion of information explosion from the study's objectives.

According to users' response, World Wide Web was highly effective on use at (40%), intranet at (26%), virtual libraries at (25%), internet bandwidth at (26%) and institutional repository (17%).

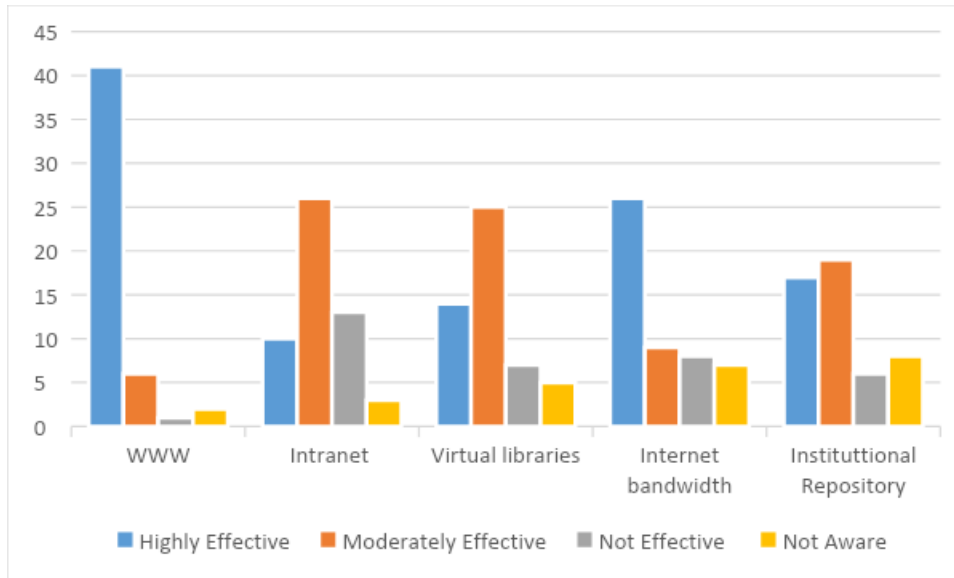


Figure 4.7: ICT Components

4.9 Information Barrier

The study analyzed several barriers to information access. These barriers may be the key reason why information users are not able to access the right information and hence information explosion. The following chart shows how the respondents responded to lack of training (4%) strongly disagreed since they felt that one can access information without being trained, 8% did not agree, 13% were neutral, (29%) were in agreement and (46%) were strongly in agreement implying majority of the respondents agreed that one needs training for them to easily access information from the library.

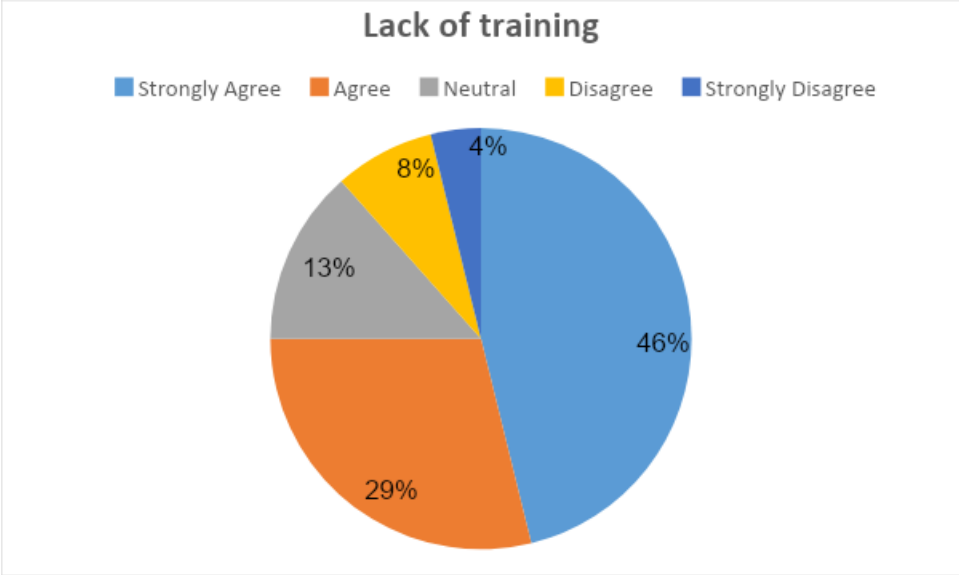


Figure 4.8: Information Barrier

4.10 Mitigation of Information Explosion

Now that most of them agreed that information explosion is negatively affecting their access to right information, the researcher therefore asked for suggestions on how we can mitigate this information explosion in our libraries. The Figure 4.8 below shows that (78%) strongly agreed on the adoption of ICT strategies which was the highest percentage, (4%) agreed, 14% were neutral, 4% disagreed, 4% strongly disagreed. From this, we can say that adoption of ICT strategies is the key in mitigating information explosion. Majority of library staff said that if library users could embrace ICT, then they can be able to mitigate the effects of information explosion.

4.11 Methods Used to Offer Information Literacy

From the interview with the librarians, most of them said that ways that were used by the management and staff to offer literacy include; workshops, open days that are normally done twice a semester, orientation after every new intake and the day-to-day issue desk services offered.

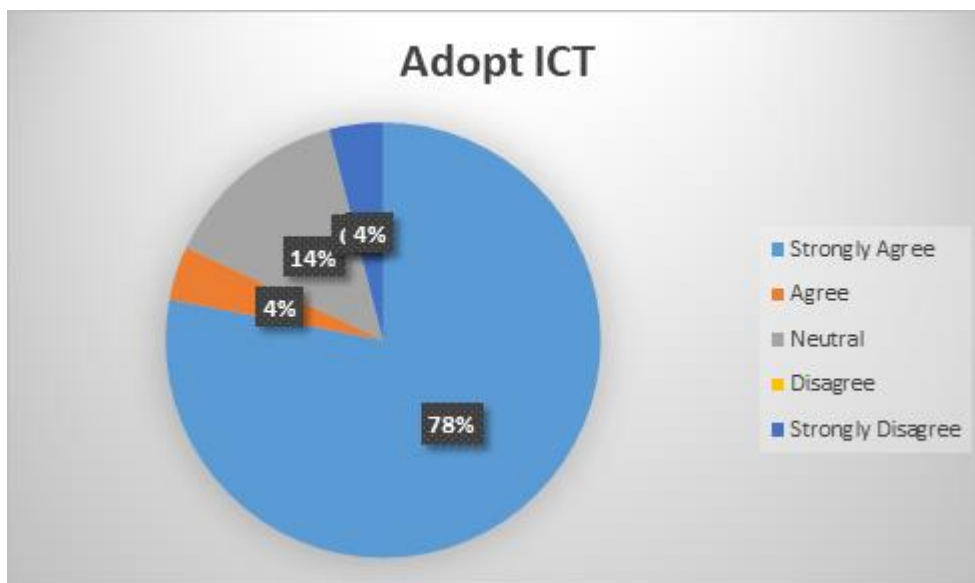


Figure 4.9: Mitigation of Information Explosion

4.12 Chapter Summary

The analyzes data results have been presented and the results about mitigation of information explosion in academic libraries have been discussed and analyzed in relation to the case study's objectives. The results were well captured in chats and tables with the specific percentages indicated and the statement responses also captured after every objective's response.

CHAPTER FIVE.

SUMMARY OF THE FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction.

Chapter Five provides information on the summary the conclusions, findings and recommendations. In addition, this chapter provides suggestions and recommendations for addressing issues related to mitigating information explosion in universities in relation to the research questions and objectives. The study was meant to assess the role of librarians in mitigating information explosion in academic libraries in public universities with particular reference to the University of Nairobi.

5.1 Summary of the Findings

The study was to investigate the role of librarian in mitigating information explosion in academic libraries in Kenya, a study done at The University of Nairobi Library. The objectives of the study were to:

1. Examine the awareness levels of information explosion among the library users at JKML.
2. Establish the effects of information explosion amongst the library users.
3. Assess information searching skills of the users at JKML.
4. Propose appropriate strategies for mitigating information explosion.

5.1.1 Awareness of Information Explosion

The findings showed that that (59%) were aware of what information explosion is all about. Most of the librarians also cited that they understood information explosion. This indicates that most of the respondents clearly understood what information explosion is and knew the extent to which they are affected. The other percentage was not aware of the challenges that come by with information explosion.

5.1.2 Effects of Information Explosion to Library Users

The objective was to determine the factors affecting information explosion amongst library users and librarians. From the questionnaire, it shows that (74%) indicated that information explosion had a negative effect on them. The (74%) that indicated they were affected negatively means that they did not understand how to overcome the challenge of information explosion and hence needed guidance and training on information retrieval while the (26%) were able to overcome the challenge and were aware and experienced the positive effects of information explosion. This shows that the majority of the library users had challenges in accessing information.

5.1.3 Information Searching Skills

The objective was to determine the searching skills of library users. The researcher asked the users the strategies they used to access information, which was key words, title, author, subject, browsing in the repository, and the e-resources. The study realized that title search was the most widely utilized method of searching. The users lacked knowledge on more available searching skills, which could guide them to specific information.

5.1.4 Appropriate Strategies to Mitigate Information Explosion

Most respondents cited the adoption of ICT and literacy training can help mitigate information explosion. The librarians too indicated that the appropriate strategies were the adoption of ICT to leverage on quality of information access as well as addressing the challenges that affect access to information. The respondents also suggested that literacy training to users would also help the users be informed and have knowledge on how to access relevant information.

5.2 Conclusion

In conclusion, the study concluded that there is so much information available for use but because of information explosion, and lack of retrieval skills, users end accessing a lot of unwanted information and as a result they get confused on what information to pick. The adoption of the ICT would assist in mitigation of information explosion. Availability of a high-speed internet bandwidth and use of off campus access.

5.3 Recommendations

From the study findings and conclusion, the following recommendations were made:

On the level of awareness, the study recommends that the percentage on awareness be increased from 59% to 100%. This will help users to understand the situation of information explosion so that they can look for mechanisms to overcome it. Regular sensitization and orientation to all library users and constant training on information explosion to staff members. Information communication technology has changed and created the most modern resources that can be accessed through the internet and its related agencies. The old generation of information seekers

may not be well acquainted with these new technologies while the current generation may not have the technical expertise.

On effects of information explosion, the study recommends training on the users on how to access specific and authentic information from the mass of the available information and also be trained on how to filter relevant information. The study recommends that library professions provide open access avenues, access to e-resources and other digital library resources so that users can get information from authentic sources.

On information searching skills of the users, there is a need for information literacy and learning skills in institutions of higher learning in order to ensure that programs are effective in addressing new information and communication technologies. Information literacy and learning skills should adequately address emerging technologies and other related issues. Users should be sensitized on advanced search skills. They should not only be limited on use of title search but should be trained on advance search skills whereby they can use other search strategies like use of author, subject, browsing in the repositories and e resources so that they can limit their search to specific information.

On Strategies for mitigating information explosion, the study recommends use of modern ICT to leverage on quality of information access. There is a need to embrace new technology and train staff to impart the same to users. There should be enough management support in hiring qualified staff who will make sure user are guided correctly on what information they access and use. The management should give financial support for ICT support and information infrastructure.

5.4 Suggestion for Further Research

The researcher suggests the following for further studies.

A further research to be done on implementation of the searching tools. This is because the tools have been available for long but not 100% of users search information using them.

Another research should be carried out on maximum utilization of ICT to mitigate information explosion in academic libraries.

Finally, yet importantly, the researcher suggests that a research be carried out on specialized librarians whereby we have a nurse librarian to attend to the needs of nurses or a law librarian to work in the law field to be able to attend to their specialized needs.

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APPENDICES

APPENDIX 1: INTRODUCTION LETTER

Bolyvia Kwamboka
Department of Library and Information Science
University of Nairobi
P.O.Box 30917-00100
Nairobi.

To respondent,

RE: RESEARCH LETTER INTRODUCTION.

I am a student in The University of Nairobi, Department of library and information science doing a Masters Degree in information science. I am carrying out a research on Mitigating information explosion in academic libraries a case study of Jomo Kenyatta Memorial Library-UON.

The study aims at collecting data and information from the library staff and library users of The University of Nairobi (main campus) and Parklands campus. The objectives of the: Impact of the Internet to Information Explosion; Effect of information explosion to library users; Impact of ICT to information explosion; Challenges experienced by Librarians in managing Information explosion; Information literacy in the information explosion era.

You are a participant in this study and the information or the views you may provide shall be confidential and be used for the academic purpose of the study.

Kind regards.

Yours sincerely,

Nyangoya Kwamboka Bolyvia
Registration number: C54/82462/2015

PPENDIX II:
QUESTIONNAIRE FOR THE LIBRARY USERS

Instructions

Kindly respond by ticking your answer in the boxes provided. The questions that need suggestions and comments, please write on the provided blank spaces.

Section A: demographic information

1. Indicate your gender

Male

Female

2. Indicate your age bracket

20-30 years

31-40 years

41-50 years

51 years and above

3. User category

Law student

Mlis students

Library staff

Section B: Information sources

4.a Do you understand what information explosion is?

Yes No

4. b. If yes, does information explosion affect you negatively on information access in the library?

Yes No

5. Which types of resources do you seek in the library?

- Text book
- Journals
- Online e-resources
- Others (specify)

6. How do you start seeking for information that you need in the library? Use a scale of 1-5, where 1 is not at all, 2 is small extent, 3 is moderate extent, 4 is great extent and 5 is very great extent

	Information seeking behavior	5	4	3	2	1
a	I use lecturers as my starting point for seeking information					
b	I use professional colleagues as my starting point for seeking information					
c	I use official publications as my starting point for seeking information					
d	I use the internet as my starting point for seeking information					
e	I use the library as my starting point for seeking information					

f. Which other ways other than the ones highlighted above do you use to seek for information?

.....

.....

.....

.....

7.0 To what extent do you use the following search strategies to access information in the library?

Use a scale of 1 to 5 where 1 is strongly disagree, 2 is disagree, 3 is neutral, 2 is agree and 5 is strongly agree.

	Search strategies	5	4	3	2	1
A	Key word search					
B	Title search					
C	Author search					
D	Subject search					
E	Browsing in library or repositories					
F	Searching the library e-resources					

8. How would you rate the importance of the following ICT components in relation to the growth and expansion of information explosion? **(On a scale of 1 to 4 where ;) 4. Highly effective, 3. Moderately Effective, 2. Not effective 1. Not aware**

	STATEMENT	4	3	2	1
A	World Wide Web				
B	Intranet				
C	Virtual libraries/ Online libraries				
D	Internet bandwidth				
F	Institutional Repositories				

9. To what extent do you agree or disagree with the following statements on barriers of quality information. (On a scale of 1 to 5 where ;) 5=strongly agree, 4=agree, 3=neutral, 2=Disagree, 1=strongly disagree.

	Barriers of quality information access	5	4	3	2	1
A	Lack of training on information access procedures					
B	Lack of information literacy skills					
C	Lack of adequate information searching skills					
D	Lack of current awareness services					

10. To what extent do you agree with the solution to the effects of information explosion? (On a scale of 1 to 5 where ;) 5=strongly agree, 4=agree, 3=neutral, 2=Disagree, 1=strongly disagree.

	Solutions to the challenges faced	5	4	3	2	1
A	Adopt and integrate more on ICT					
B	Acquire information searching skills					
C	Provision of information literacy skills					
D	Classification of information					
E	Full text journal access					

APPENDIX III

INTERVIEW SCHEDULE LIBRARY STAFF

1. Kindly state methods used to offer information literacy training to the staff and students.

.....

2. In your opinion, kindly tell me the type of information resources do library users mostly look for in the library.

.....

3. Are the e-resources in the library easily accessible?

.....

4. Kindly outline how frequently library users ask for assistance when searching for information in the library.

.....

5. In your opinion, is the information provided by the library adequate for library users?

.....

6. Outline the routine for the information literacy training sessions at the JKML Library.

.....

.....

7. State the strategies used to manage information explosion at the JKML library.

.....