EVALUATION OF KNOWLEDGE SHARING RESEARCH PUBLICATIONS IN HIGHER EDUCATION INSTITUTIONS IN KENYA: AN INFORMETRIC STUDY

VITALIS ADONGO MWAMBASA

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT FOR THE REQUIREMENT OF THE AWARD OF MASTER OF LIBRARY AND INFORMATION SCIENCE, DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE, UNIVERSITY OF NAIROBI

JULY, 2021

DECLARATION

This research project is my original work and has not been presented to any university for any award or anywhere else for academic purposes.

Signature: _____ Date: 23rd July 2021

Name: Vitalis Adongo Mwambasa

Registration No: C54/6692/2017

This project has been submitted for examination purposes with our approval as University Supervisors.

Signature: Date: 23rd July 2021

Name: Dr. Dorothy Njiraine.

Chairperson and Senior Lecturer,

Department of Library and Information Studies (DLIS),

University of Nairobi.

Signature: **Date**: 23rd, July 2021

Name: Dr. John Otieno Oredo.

Lecturer Department of Library and Information Studies (DLIS),

University of Nairobi.

DEDICATION

I dedicate this project to my mother, Leonidah Khasandi, my two sons, Jamal Maina and Juan Marietta and my wife, Delvine Kerubo, who have constantly encouraged and supported me throughout this journey.

ACKNOWLEDGEMENTS

First and foremost, I am grateful to God for the gift of health and sound mind throughout this study.

Secondly, my sincere appreciation to my supervisors, Dr. Dorothy Njiraine and Dr. John Oredo, who in their special ways, provided guidance and the requisite intellectual counsel in the production of this research project.

I salute Dr. George Kingori, Dr. Grace Irura, Dr. Elisha Makori and Dr. Hellen Amunga, my lecturers at the Department of Library and Information Science at the University of Nairobi for their technical support and contributions through the course work, proposal and in this research project. You all contributed to this work either directly or indirectly. Merci beaucoup!

To my classmate, Mark Osundwa, who supported me in the access of the electronic resources at the University of Nairobi eLibrary. Special appreciation to you for the unwavering support.

Finally, to my second parents, mentors and friends, James Njuguna Kimani and Dr. Jane Wanjira for the constructive criticism, encouragement, and those long phone calls. You have been my inspiration and trailblazers. Thank you all.

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ABSTRACT

Informetrics is simply the study of quantitative aspects of information. It uses statistical and mathematical aspects to reveal the growth of literature in many fields of study. This study sought to examine the trends of knowledge sharing research publications in higher education institutions in Kenya between the years 2014 and 2018. An informetric technique was used to examine the growth trend, forms in which articles are published in, subject domains and the nature of authorship of these knowledge sharing publications. Lastly, the study sought to propose a practical knowledge sharing framework applicable for higher education institutions in Kenya. The population of this study constituted knowledge sharing publications indexed by eleven purposively selected databases. A literature review was also conducted to establish different knowledge sharing frameworks used in higher education institutions. Data from databases was extracted using Herzing's Publish or Perish Software and exported in Excel and notepad for further analysis. Findings show that there is steady growth of the knowledge sharing research publications. The coverage of knowledge sharing research published by universities in Kenya in the key bibliographic databases is still minimal. The total 64 publications found were only indexed in four databases - Scopus, Emarald, PubMed and Google Scholar. The rest did not generate any search results. Google Scholar had the highest with 26 (40.62%) publications. The years 2014 and 2018 had lowest and highest number of publications respectively. The average publication growth rate was 20%. Journal was the most preferred channel of publishing and disseminating knowledge sharing research publications. The second most preferred channel was conference papers. Information sciences, health sciences, public health and agriculture were the most favored subject of publication respectively. Concerning the authorship, most knowledge sharing publications were single authored. The average number of authors per article was 2.27. Even with this, it was also observed that collaborative authorship is increasingly gaining popularity. Rewards, culture, collaboration, and technology were the key elements of knowledge sharing frameworks for higher education institutions in Kenya. This study recommends training of junior researchers/graduate scholars on research and publication skills. In addition, they should also be encouraged to collaborate with seasoned researchers and seek sponsorship for participation in seminars, conferences and workshops so that they can develop their skills through peer learning. It is envisaged that the study findings will be useful to scholars in higher education institutions to establish the areas of strength that can be amplified, and weakness be invigorated. It can also be useful in decision-making on areas of collaboration and also as a reference and a contribution to the field of informetrics. In conclusion, this study recommends further investigation on the nature of author collaborations and its effect on research output and impact. Finally, an inquiry of the most prolific researchers in knowledge sharing in Kenyan universities would be beneficial not only to local researchers and scholars but also internationally especially on establishing who to collaborate with in their future research work.

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LIST OF ACRONYMS AND ABBREVIATIONS

AJOL	African Journals OnLine
CDC	Centre for Disease Control and Prevention
CUE	Commission for University Education
ERIC	Education Resources Information Center
HEI	Higher Education Institutions
IR	Institutional Repositories
KM	Knowledge Management
KS	Knowledge Sharing
NACOSTI	National Commission for Science, Technology and Innovation.
SECI	Socialization, Externalization, Combination, Internalization
UNESCO	United Nations Educational, Scientific and Cultural Organization
URAP	University Ranking by Academic Performance
USAID	United States Agency for International Development
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

In today's economy both in academia and practice, knowledge has emerged as a critical ingredient to ensure sustainable strategic competitive advantage (Makori et al., 2015: p.1; Poonkothai, 2016: p.11 & Omotayo, 2015: p. 2). Universities are considered as scientific and intellectual centers, which researchers resort to so as to solve grueling problems facing the current society. Lecturers and tutors in higher education institutions (HEIs) are a prime example of what Drucker (1959) referred to as 'knowledge workers'. They play a critical role in creating and sharing knowledge. Through knowledge sharing, lecturers, students, scholars or even non-teachings staff can exchange ideas so as to complete assignments, conduct research and/or improve effectiveness and performance. In doing so, they not only enable provision of high-quality service at the university but also offer knowledge which is utilized in the job market (Trivella & Dimitrios, 2014: p. 489).

According to Coukos-Semmel (2003), knowledge in HEIs exists in two forms; academic (also referred to as scholarly knowledge) and nonacademic organizational knowledge. The primary focus of the universities is the production of the academic knowledge – usually published through peer-reviewed journals, articles, books, theses and dissertations. Organizational knowledge, on the other hand, is key for institutional business continuity. Academic and organizational knowledge can exist both in explicit and tacit form. Tacit knowledge, however, is difficult to capture and share due to the fact that it exists in people's minds. Therefore, universities need to invest in technology to capture, store and share this knowledge across the departments, students, lecturers and non-teaching staff for effective decision-making (Toro & Joshi, 2013: p.21). As observed, however, students and scholars in the universities mainly focus on the individual scholarly achievement such as passing exams and gaining promotions respectively rather than having a common shared institutional goal. In fact, Dokhtesmatia and Bousarib (2013) discoursed that this has contributed to the reluctance of universities to share knowledge as compared to the private sector.

The concept of knowledge sharing has been adopted and implemented in many regional and international organizations both in the private and public sector. Higher education institutions, however, are yet to take the advantage of prospects offered by knowledge sharing (O'dell & Hubert, 2011: p.16). This is despite the competitive and sustainability advantage brought about by knowledge sharing (Njiraine, 2019; Nunes, 2017; Al-Kurdi, 2018 and Agarwal & Marouf, 2014). Al-Kurdi, Argarwal and Marouf (2014) attributed this failure to the lack of clear knowledge implementation strategies in place that the university management can adopt.

As a result, the purpose of this study was to assess knowledge sharing research publications in Kenyan higher education institutions (HEI) over the last five years (2014 to 2018). This study highlighted gaps and recommended approaches to encourage more scholars to research on knowledge sharing.

1.1.1 Knowledge Sharing within Higher Education Institutions

The core function of universities and colleges is imparting knowledge to the learners. While doing so, they are constantly faced with many challenges including the ever-changing learners needs, government demands for policy change, expansion, and institutional human resource restructuring to ensure efficiency and sustainability. As observed by Agarwal and Marouf (2014), there is an increased competition from institutions all over the world offering online courses, scholarships, and interest-free loans, and at the same time provide a lower cost of education. In particular, universities in Kenya are currently facing the challenge of financial stability and especially those whose parallel (self-sponsored) programmes were the biggest revenue generator. (World Bank, 2019).

To cope with these numerous of challenges, higher education institutions need to continuously harvest, store, share, use and reuse both existing and new sources of knowledge (Rowley, 2000; Alexandra et al., 2019). The administrators in these institutions should constantly focus on identifying and tapping into both individual's knowledge (held by lecturers, students, scholars and non-teaching staff) and institutional knowledge (in collective form) so to survive in this competitive economy (Tywoniak, 2007; Reagans, Argote & Brooks, 2005; Van den Steen, 2010 & Achim, 2012).

Knowledge sharing needs to be fully integrated into daily routine processes so as a minimize duplication efforts among university faculties (Arntzen, Worasinchai & Ribiere, 2009). Faculties members spend most of their time re-creating teaching materials instead of teaching and researching. Additionally, institution repositories, which are considered as a source of explicit knowledge, are also not fully utilized by the students in the universities due to technological and systemic barriers (Makori, Njiraine & Talam, 2015: p. 619).

Informetric studies have been applied in different fields of study. Although there are notable informetrics studies conducted in higher education institutions in Kenya, its development is deficient. The complexities of literature in various disciplines have necessitated the use of informetric approaches (Zungu, 2019). According to Maluleka and Onyancha (2016), informetrics studies have been used by institutions and organizations to inform decisions and policies in both economic and social domains touching on the use, flow, and patterns of information. Finally, informetric studies can also be used in tracing relationships amongst academic journals and authors, studying researchers publishing behaviours, analyzing the past and present and forecast future publishing trends, evaluate the impact of scholarly contributions, locating literature of specific fields and others (Raju, 2017: 12; Jacobs, 2010: 4 and Glänzel, 2014: 230).

1.1.2 Research in Higher Education Institutions in Kenya

As of 2017, Kenya had only seventy-one universities comprising thirty-five public and thirty-six private universities in 2017 (CUE, 2017). This is a significant upsurge from 1970 where University of Nairobi (Royal Technical College before then) was the only higher education institution in Kenya (Sifuna, 2010). Similarly, student enrolment has been on an upward trend with the growth in number of the higher education institutions (Kenya National Bureau of Statistics, 2019).

Universities are considered the main generators of knowledge, which is the primary resource in this knowledge-based economy. Research data output from Scimago Journal and Country Rank (2018) ranks Kenya second in quality research output in Sub Saharan region, just after South Africa. Kenya, as compared to her counterparts in East Africa (Uganda and Tanzania), leads the pack not only in research output but also in the quality and impact of the research produced.

Despite this growth in general research output in Kenya, knowledge sharing research output has however not shown a similar trend. In fact, Njiraine (2019) pointed out gaps in knowledge sharing academic output at the national level. Specifically, research into knowledge management and knowledge sharing in universities is limited as compared to the private and public sector (Al-Kurdi, El-Haddadeh & Eldabi, 2018; Sandhu, Jain, & Ahmad, 2011).

1.2 Statement of the Research Problem

The most popular catchphrase among the scholars 'publish or perish' indicates the level of importance given for publishing activity. Publishing research work for scholars in universities is an obligation and powerful method to demonstrate academic aptitude to peers, protect intellectual property as well as maintain competitive advantage (Rawat & Meena, 2014: p.87). In fact, O'Meara (2011) argues that research commands scholar's first loyalty and is valued above all other activities. It is for these reasons that there has been rapid growth of research publications, not only at international level, but also at the regional and national level.

Globally, informetric studies have been utilized in many different disciplines of study. For example, Merigó, Rocafort and Aznar-Alarcón (2016) used informetrics to study most influential research in business and economics by presenting the most cited papers by countries using Web of Science Core database. In Africa, however, and as observed by Ajiferuke (2011), research output in the area of informetrics has been comparatively low. In fact, Johnson (2011) in his analysis affirmed this as true in East and Southern Africa with the exception of South Africa. Even with South Africa, it also has a limited expertise in the field of informetrics (Pouris, 2012). In fact, Zungu (2019) warns that overlooking the advancement of informetrics might run a risk of shortage of informetric studies and competent informetricians.

In the past decade, informetrics studies in Africa have mainly been dominated by few prominent and periodic scholars. Examples include; agricultural research trends in Africa (Ocholla & Onyancha, 2006), research output in Nigeria (Ani & Onyancha, 2012), HIV/AIDS research in E&SA (Onyancha, 2007), corruption literature in Africa (Ocholla & Onyancha, 2004) and publication patterns of academic librarians in Sub Saharan Africa (Ocholla, Ocholla & Onyancha, 2012). A similar trend has been replicated in East Africa; examples include publication patterns among librarians in East Africa (Sitenei, 2009), also supervised by Ocholla, patterns in medical and health research in Kenya (Rotich and Onyancha, 2016), and a

comparative study of indigenous knowledge in Kenya and South Africa (Njiraine, Ocholla & Onyancha, 2010).

There are also limited informetric studies that reveal trends and patterns in knowledge sharing research in higher education institutions. Collaborative trends too have not been fully explored. It is this scarcity of informetric studies and informetricians in most African countries that Onyancha (2007) attributes to the lack current and relevant information to aid in decision-making.

1.3 Aim of the Study

The aim of this study was to examine the trends of knowledge sharing research publications in higher education institutions in Kenya between 2014 to 2018 using an informetric approach.

1.4 Objectives of the Study

The study was guided by the following specific objectives:

1. To examine the growth of knowledge sharing research publications in higher education institutions in Kenya from 2014 to 2018.
2. To assess the types of knowledge sharing research publications from 2014 to 2018.
3. To analyze subject domains of these publications.
4. To establish the nature of authorship in knowledge sharing research publications and lastly;
5. To propose the knowledge sharing framework for higher education institutions in Kenya.

1.5 Research Questions

The following research questions defined the focus areas of this study:

1. What are the trends of knowledge sharing research publications in higher education institutions in Kenya from 2014 to 2018?
2. What are the various types of knowledge sharing research publications produced by higher education institutions in Kenya?
3. What are the subject domains covered in knowledge sharing research publications in higher education institutions in Kenya?

4. What is the nature of authorship for these knowledge sharing research publications?
5. What is the possible knowledge sharing framework applicable to higher education institutions in Kenya?

1.6 Significance of the Study

This study can be beneficial to collection development librarians in higher education institutions. With the current budget constraints, this study can be instrumental for which to base collection development decisions and specifically when selecting relevant knowledge management resources in their libraries. The study can be important to database and journal subscribers to identify which databases are likely to get more attention from librarians and other users. To the users, who want to use more authoritative journals for study and research purposes, this study can provide them with relevant information on which to base the decision when selecting most current and relevant knowledge sharing resources. To potential students, who intent to pursue a course in knowledge management, it can be useful in determining the suitable institution to choose. Finally, to the future researchers, who would like to publish, this study can be a useful tool for examining current as well as past trends in knowledge sharing research production of publications, and to evaluate the sources prior to publishing their research findings.

1.7 Scope and Limitations of the Study

This study was limited to:

1. Documents published and indexed in the eleven bibliographic databases namely Web of Science (Web of Knowledge), Scopus, Emerald, PubMED, JSTOR, Elsevier, EBSCO Host, SpringerLink, ERIC, Google Scholar, AJOL for the period 2014, and 2018 and those produced by universities in Kenya. However, the access capability was limited to vastness of the databases.
2. Publications that relate to knowledge sharing in Kenya formed the documents (population) of the study.
3. For collaboration works, only studies published by authors affiliated to higher education institutions in Kenya were reviewed.
4. In the analysis of knowledge sharing literature, descriptive informetric method (productivity count, topics, subjects, and structure analysis) was used.

5. Given that each databases have their own strengths and weaknesses, while other databases such as Emerald provide more data regarding the publication, other databases such as SpringerLink does not. This posed challenges when analyzing data.
6. Unpublished knowledge sharing works were not covered.

1.8. Definition of Concepts

This study adopted the following definitions of key terms:

Knowledge: The awareness, familiarity or understanding of a person. The information, skills or facts gained through their experiences in life, learning from other people or environment or their own discovery.

Knowledge Management (KM): The process of identifying, recording, producing, managing, and sharing knowledge and information among individuals, in and across institutions to enhance performance and competitiveness.

Knowledge Sharing (KS): An exchange of experience, actions, events, thoughts with an expectation of gaining more insights and understanding. It is an individual's decision to voluntarily share knowledge (describe, demonstrate, codify) and the other party's ability to internalize (read, learn by doing, interpret) the shared knowledge.

Higher Education Institutions (HEI): Also referred to as institutions of higher learning, constitutes all post-secondary education, training and research guidance education institutions regulated by state authorities (in this case, Commission for University Education in Kenya). In this study HEI refers to all public and private universities in Kenya.

Informetrics: The study of all kinds of research that focuses on quantitative (statistical or mathematical) aspects of information in any form (Egghe,1994).

1.9 Chapter Summary

This chapter provides a detailed background on knowledge sharing in higher education institutions in Kenya, statement of research problem, aim, objectives, and study questions answered in chapter four. Further, the chapter states the significance of this study and as well as its scope and limitation. Finally, in this chapter you will find the definition of operational terms and concepts used in the study such as knowledge, knowledge sharing, higher education institution and informetrics. The next chapter reviews different literature related to knowledge sharing while exploring the similarities and the gaps from previous studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter examined the literature on knowledge sharing in higher education institutions. Literature from previous studies was also reviewed and research gaps that existed. The first review was specific to the growth of knowledge sharing research, while the second looked at different types of knowledge sharing publications. The third section covered the subject areas of these knowledge sharing publications, and the fourth reviewed the nature of authorship of this publication. Lastly, the review examined the different knowledge sharing frameworks applicable to the higher education institutions.

2.2 Knowledge Sharing

Knowledge sharing is a key emphasis for knowledge management. The concept aims at bringing the link between the individual knowledge (tacit) and organizational knowledge (both tacit and explicit) into its application and attainment of its value. In other literature, knowledge sharing is used synonymously with knowledge transfer (Jonsson, 2008: p.18). According to Kmieciak and Michna (2018), knowledge sharing enhances innovation, organizational performance, and competitive edge. Knowledge sharing in universities occurs in three levels: institutional, departmental and individual (Argote and Ingram, 2000; Koskinen, Pihlanto and Vanharanta, 2003). Although knowledge sharing can be said to be one-way, in most cases it is a two-way or

multilateral exchange as the parties involved learn from each other. This creates an enabling environment, where knowledge freely shared.

2.3 Growth of Knowledge Sharing Research in Higher Education Institutions

Higher educational institutions, which have already been accredited with minimum requirements such as advanced curriculum and infrastructure, are contingent on their ability to produce new knowledge (Aithal, 2016). According to Kwiek (2018), academics publish their work for the sole purpose of getting scientific recognition, if that is not done, very few will continue engaging in research activities. In fact, Gralka, Wohlrabe and Bornmann (2019) in their study on higher education institutions suggested three indicators used in measuring research productivity as: most frequently cited papers, the subject area and year of publication.

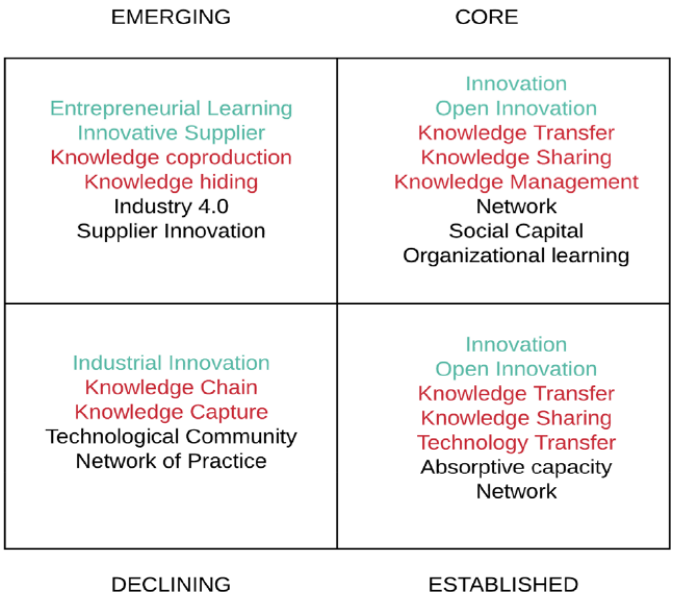
Studies in knowledge sharing focusing on universities have gained a lot of interest globally, regionally. However, the gap still exists nationally (Njiraine, 2019). Examples of recent studies conducted globally include behavioral determinants of knowledge sharing and academic productivity (Fauzi, M. et. al, 2019), and knowledge sharing amongst UK academics (Fullwood, Rowley & McLean, 2018). Most of these studies focused on the enablers and barriers in knowledge sharing such as fear, lack of trust and cultural differences. In Africa, studies have focused on knowledge sharing practices besides the barriers. Some of the examples include: studies by Njiraine (2019), who analyzed the enabling knowledge sharing practices for academic and research in higher education institutions, Kabilwa (2018) investigated the knowledge sharing practices in Zambian higher education institutions, while Ramjeawon and Rowley (2019) did a comparative study in two universities and linking how to embed knowledge sharing in higher education institutions. Ramjeawon and Rowley (2017) analyzed the enablers and barriers in knowledge sharing in universities in Mauritius.

In Kenya, similar studies have been conducted by Ogendi (2017), Kimile (2015) and Murumba (2011) focusing on the knowledge sharing tools such as social networking, institutional repositories, practices, barriers, and its enablers in universities. However, when compared to other regions, there have been gaps in the production of these knowledge sharing studies.

In conclusion, a study done by Castaneda and Cuellar (2020) established the core, emergent, and declining keywords research in knowledge sharing and innovation. Using complementary methodology, this study established that the emergent and core knowledge sharing topics were

open innovation, knowledge sharing, and absorptive capacity. This was summarized in the figure below.

Figure 1: Emerging Knowledge Sharing Topics



Note. Adopted from Knowledge Sharing and Innovation: A Systematic Review (Castaneda and Cuellar, 2020, p.169).

2.4 Types/Forms of Knowledge Sharing Research Publications

Although academic publications are published in peer-reviewed journals in both printed and online formats, different formats exist in different bibliographic forms. Explicit knowledge is considered easy to capture and it comes in tangible form such as books, journals, theses, dissertations, newspapers, and web resources (Obrenovic & Hudaykulov, 2015). While on the other hand, tacit knowledge is difficult to capture, it is shared in situations where people interact

face-to-face (Howells and Jeremy, 1996). Such knowledge is captured in the meeting minutes and seminars and conference proceedings. Examples of knowledge sharing in publications include knowledge sharing practices in higher education institutions (Nunes, Kanwal and Arif, 2017) and Knowledge Sharing in Practice, a book by Huysman which discusses different methods organizations use to share knowledge to improve their performance. Theses and dissertations too published in the university's institution repositories are another set of examples. African Journals Online (AJOL) and ERIC journals also publish annual conference proceedings on knowledge sharing.

2.5 Subject Domains of Knowledge Sharing Research Publications

The choice of research topic, as noted by Koenigsknecht et. al. (1989) is influenced by: preference of the supervisor, adviser or sponsor, trends in the field, likelihood for the research to be published, and the project benefit. Jacob (2015) urges that scholars in higher education are focusing more on developing topics with more future growth potential. Knowledge sharing study subject areas vary across the regions and nations depending different interests of the researchers. An example of a study in the education discipline is one by Kanwal, Nunes and Arif (2019) who analyzed different knowledge sharing processes in the universities in South Asia region.

In the field of agriculture, Thomas, Riley and Spees (2020) studied the relationship between social interactions and knowledge sharing among the catchment farmers in North-West of England (UK), whereas Kahinga (2014) focused on knowledge sharing among cash crop farmers in Kenya. In addition, Abdul-Jalal, Toulson and Tweed (2013) carried out a study in the field of economics and business studies in which they investigated the successes in knowledge sharing and sustaining organizational competitive advantage. In computer science, Masih, Sriratanaviriyakul, El-Den and Azam (2018) studied the impact of knowledge sharing on employees' innovation initiatives.

2.6 Nature of Authorship for Knowledge Sharing Research Publications

Authorship has over time been a central element in informetrics practice dating back from the Lotka's investigation that resulted into Lotka's Law of Informetrics (Das, 2015). Lotka's law describes scientific production as well as the relationship between writers and the number of

papers they publish. In today's scientific and technological work, multiple authorship has gained prominence and proven to be a necessity towards increased collaboration in all areas of study. The current trend is not only in the sciences, but also it has been seen in humanities and social sciences (Sudhier, 2017). These types of collaborations have enabled researchers across all geographical boundaries to pull together their intellect in their areas of specialization.

An analysis of authorship in the knowledge sharing studies in section 2.3 above reveals a decrease in authorship collaboration especially in the national studies. Internationally, as observed in these studies, there is collaboration of three to four authors: Feuzi, Tan and Thurasamy (2019), Fullwood, Rowley and McLean (2018), Adams, Hong, Aslam, Arfeen, Mohti, and Rahman (2018), Ghodsian, Khanifar, Yazdani and Dorrani (2017) and Nordin, Daud and Osman (2017). In Africa, the collaborations tend to reduce to mostly one or two authors per article; Njiraine (2019), Kabilwa (2018), Ramjeawon and Rowley (2019), Ramjeawon and Rowley (2017), Kabiru (2017). Wilson and Julita (2015) and Mavodza and Ngulube (2012). However, in Kenya, most knowledge sharing studies were single authored. Collaborative authorship is also minimal among local institutions as compared with regional and global institutions. Cross collaborations are, however, common internationally. For example, in a study by Ghodsian, Khanifar, Yazdani and Dorran in Tehran University, all the four authors come from different faculties in various schools.

2.7 Knowledge Sharing Frameworks for Higher Education Institutions.

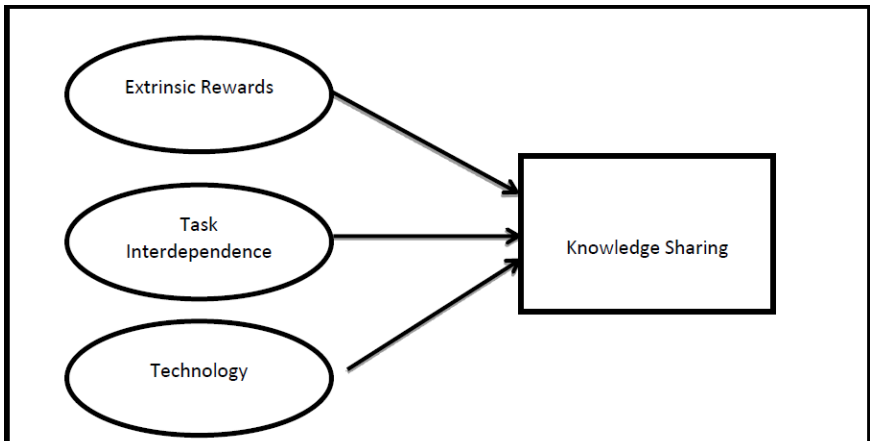
The knowledge sharing framework combines concepts, facts and statistics to provide a comprehensive picture of how knowledge sharing occurs in higher education institutions (Salzano et al., 2016). Knowledge sharing in itself is an interactive and dynamic process that is multidirectional in nature (Senquiz-Diaz, 2019). Different knowledge sharing frameworks have been proposed by various scholars. However, this study identified the knowledge sharing framework by Maidin and Izhar (2018) as the most current and relevant.

2.7.1 Maidin and Izhar knowledge sharing framework for HEI

In this framework, Maidin and Izhar (2018) proposed three factors that influence knowledge sharing in higher education institutions as: extrinsic rewards, task interdependence and technology. They argued that one way to encourage employees to share knowledge among

higher education institutions is by offering inducements such as rewards and bonuses. However, rewards were not only seen as pay but also the outcome that individuals may feel appreciated for sharing knowledge. Second, they said that employees in higher education institutions are more likely to interact (and share) when they rely on one another for similar tasks/assignments, and they urged departmental heads in such institutions to encourage staff to collaborate, particularly in research fields. Lastly, they argued that introducing technology (such as institutional repository, mobile phones, social media- such as WhatsApp, Facebook) in academic institutions will increase knowledge sharing ability among the staff. According to Van Den Brick (2003), technology helps connecting people or enable explicit knowledge sharing. The model below summarizes their argument.

Figure 2: Maidin and Izhar Knowledge Sharing Model



Note. Adopted from A Framework Based Knowledge Sharing Factor in Higher Institution (Maidin and Izhar, 2018, p.851).

The authors of this framework put emphasis on extrinsic rewards/ incentives as a motivator for knowledge sharing. This, however, has been refuted by Todorova, Nelly and Mills, Annette (2014). In their study, they found out that financial rewards do not have significant effect on knowledge sharing attitude. Instead, they found reputation and positive feedback (reciprocity) were the key motivators for knowledge sharing. They also discussed the impact of feedback as a form of verbal reward. They argued that positive feedback from the managers and departmental heads can motivate the subordinates to share knowledge.

2.8 Chapter Summary

This chapter presented a literature review on various knowledge sharing aspects including the knowledge sharing frameworks that underpin this study. The literature review was anchored on the study objectives and presented the current state of knowledge sharing research, identifying gaps and strengths and weaknesses of the previous studies. In particular, the chapter focused on growth trends in knowledge sharing trends globally and nationally, type of publications, subject covered by these publications, the nature of authorship, and lastly the knowledge sharing frameworks applicable in the higher education institutions in Kenya. Specifically, Maidin and Izhar knowledge sharing framework was discussed, its strength and weaknesses as well as applicability in universities. The next chapter presents the research methodology, which was used for this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presented the research design, methods, study area, target population, sampling procedure, data collection methods and tools as well as data presentation and analysis techniques that were used in this study.

3.2 Research Design

The study employed a combination of qualitative and quantitative research approaches. Its emphasis on 'inclusivity' fits well with ontological pluralist research paradigm. In particular, descriptive informetrics was used. Descriptive informetrics is concerned with the characteristics of the literature studied (Galyavieva, 2013: p. 91). Informetric indicators such as geographical areas, institutions, departments, disciplines, and time periods are usually used in such analysis (Jacobs, 2010: p.4). The quantitative aspects of the study included collecting statistics on the number of times literature appears (frequency count) from 2014 to 2018, and the number of authors per single publication. Qualitative elements involved describing the characteristics of the extracted literature such as a) form or type of publications b) subject domain and database where literature was indexed. Purposive sampling was used to sample eleven bibliographic databases.

Boolean combination of keywords was used to retrieve relevant articles. The search spanned from 2014 to 2018 (5 years period). The findings were presented in graphs that reveal trends and patterns.

3.3 Sampling Technique

Purposive sampling was used to select eleven bibliographic databases for the study. In particular, criterion sampling was used based on the following database attributes 1) extent of the database's coverage, 2) comprehensiveness, 3) currency, and 4) depth of indexing and access. No sample was obtained for the research publication since the study focused on publications published between 2014 and 2018 as reflected in the eleven databases. In performing the search, target was determined by the period of the study, that is, 2014 to 2018 and the researcher formulated key words 'Knowledge' OR 'Knowledge Sharing' AND 'Kenya' with a combination of Boolean operators. Finally, the matching documents were extracted for further review.

3.4 Population of the Study

The target population of this study was drawn from the publications extracted from eleven identified bibliographic databases summarized below. Therefore, target population was described as all those documents published on knowledge sharing by universities in Kenya between 2014 and 2018.

i. **Web of Science (Web of Knowledge)** www.webofknowledge.com/: A multidisciplinary database that allows searching in multiple databases such as: social science, humanities, arts, books and proceedings from conferences, MEDLINE, and Zoological Record.
ii. **Scopus** https://www.scopus.com/: A database with a combination of abstract and citation of peer-reviewed literature. Provides MEDLINE coverage; and interface with Engineering Village, ScienceDirect and Reaxys.
iii. **Emerald** https://www.emerald.com/: Covers journals in management, library and information sciences, pure and applied sciences, engineering and technology.
iv. **PubMED** https://pubmed.ncbi.nlm.nih.gov/: A free search engine interfacing MEDLINE database of references and abstracts of biomedical and life sciences topics.

v. **JSTOR** www.jstor.org/: A digital library with peer -reviewed journals and books in the sciences, social sciences, mathematics, allied health, law, medicine, arts, history, business and economics and humanities.

vi. **Elsevier** https://www.elsevier.com/: An abstract and citation database of peer-reviewed scientific journals, books and conference proceedings.

vii. **EBSCO Host** https://www.ebsco.com/: Provides multidisciplinary and subject-specific databases mainly for academic research.

viii. **SpringerLink** https://www.springer.com/**:** Multidisciplinary online full-text access database providing access to journals, refence works, conference proceeding, books, series and protocols.

ix. **Education Resources Information Center (ERIC)** https://eric.ed.gov/: An online digital library of education research and information. ERIC provides a wide range of journals, conference papers, policy briefs, books, technical reports and research syntheses.

x. **Google Scholar** https://scholar.google.com/ : A freely accessible web search engine that indexes the full text or metadata of scholarly literature, mostly peer-reviewed journals, theses and dissertations, conference proceedings/ papers and books.

xi. **AJOL** https://www.ajol.info/: African Journals OnLine (AJOL) is an online database that provides access to peer-reviewed scholarly journals published in Africa.

3.4.1 Area of Study

Knowledge sharing was the focus subject of this study. Knowledge sharing research publications refers to all the studies that have been conducted and published in the area of knowledge sharing between 2014 and 2018. Geographically, the study focused on higher education institutions in Kenya.

3.5 Data Collection Methods and Procedures

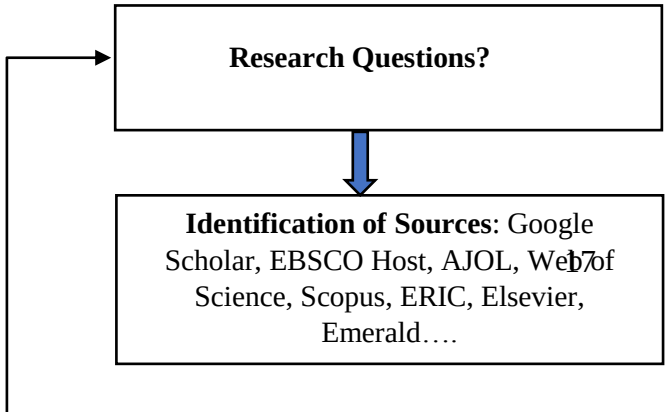
In collecting data, Herzing's Publish or Perish software was for data extraction for three databases namely, Google Scholar, Scopus and Web of Science. This is because the software source contains data in three databases only. The rest of the searches in the eight database was done manually on the database search engine.

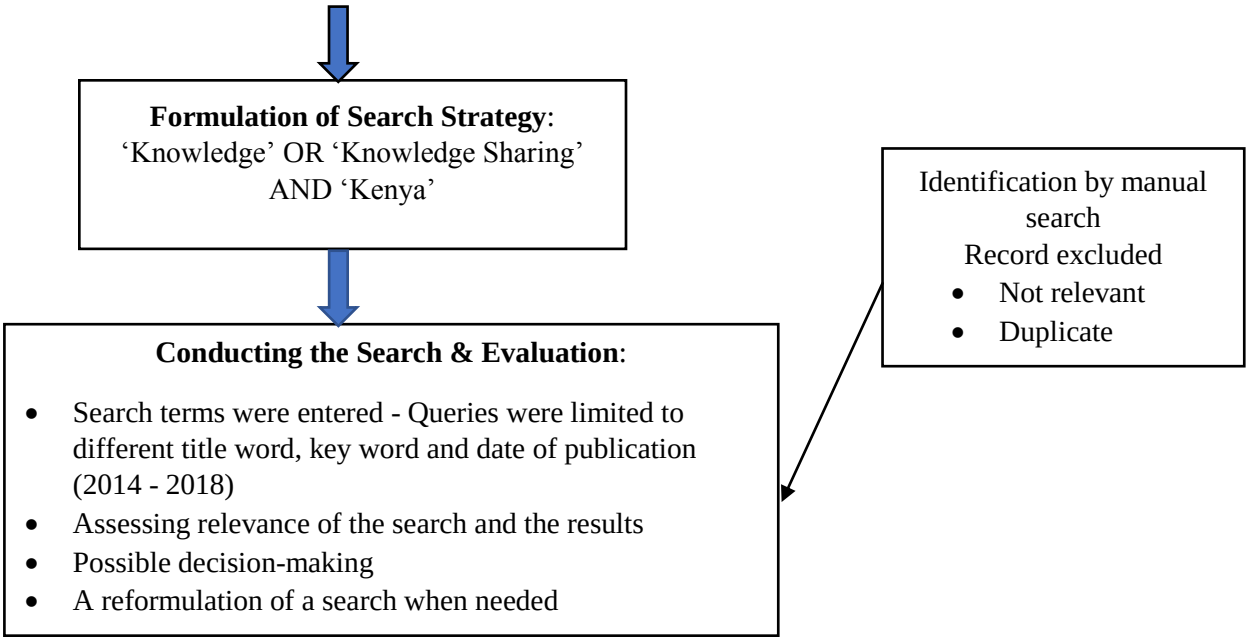
The step-by-step process of collecting data was as follows:

1. Using the Herzing's Publish or Perish software, the researcher selected the database in question and then entered keywords 'knowledge sharing' or knowledge' in the title word field and or the keywords field and 'AND' to combine with 'Kenya' then hit the search key.
2. The software contacted the data sources and displayed the results.
3. The full list of results was exported to excel spreadsheet.
4. The list was then filtered by 'Year of Publication' field, that is, 2014, 2015, 2016, 2017 and 2018 using excel filter function and resulting records were retrieved.
5. To remove duplicates, excel 'Custom Sort' and 'Filter' function was used.
6. For other eight databases, the researcher used "Search" and or 'Advanced Search' function, which is located in the menu bar then keyed in the key words 'knowledge' or 'knowledge sharing' AND 'Kenya' in the provided fields.
7. The researcher then specified the time period for the study as 2013 and 2016 on the "Year" filter option.
8. The results from the search were manually reviewed and tabulated in their various fields in excel spreadsheet.
9. Step 5 was repeated across all the extracted data sets to remove duplicates.
10. The following data elements were collected from the databases:

    a. Subjects obtain through reviewing the abstract and titles
    b. Type of publication
    c. Year of publication
    d. Names of Authors (number of authors)
    e. Geographical information (name and affiliation of the authors and country)

Figure 3: Summary of Data Collection Procedures





3.6 Research Resources

The following resources were used to conduct this study:

- Jomo Kenyatta Memorial Library (JKML) elibrary was used extensively to access electronic databases.
- Computer and computer software: The researcher used a personal laptop for accessing and extracting information from electronic databases (data collection), word processing, analysis and presentation. In statistically manipulating data, Microsoft Excel was used for tabulation, running frequencies and visualization. Notepad++ and Microsoft Word processor was used to manipulate qualitative data, that is, subjects covered, names of authors.

3.7 Data Analysis and Presentation

To extract records from bibliographic databases, Herzing's Publish or Perish software was used. Extracted data was then merged and stored in the Microsoft Excel spreadsheet. Next, the data records were edited to check for errors and omissions by the researcher. This process entailed conducting basic data checks for outliers and removal of duplicate items (where multiple sources were used). This was done using the Excel filtering option. Data was then be validated through comparing the results with the output to determine whether it was done as per the set standard. Invalid case and variables were then removed manually to ensure the data set is free of bias.

Frequency analysis was used to determine the number of times a variable has occurred (to measure the publication count). For filtering, cleaning, running frequencies and visualization data into graphs and charts, Microsoft Excel software was used. Tableau and Word Clouds software were also used to perform advanced data visualization. Data was be presented in graphs and charts. Qualitative data such as subject, author and subject domains was organized alongside with the matching quantitative data in a table format. This made it easy to decipher, comprehend, and get data that helped answer the study objectives.

3.8 Ethical Considerations

All databases used in this study were acknowledged. Before conducting this study, the researcher obtained authorization from the University of Nairobi, Department of Library and Information Sciences (DLIS) and the National Commission for Science, Technology, and Innovation (NACOSTI) - see Annexes I & II for research permits. In addition, the researcher submitted the all the study findings to plagiarism check to ensure that the work passed the originality check. Credit was given to support works by other authors.

3.9 Chapter Summary

This chapter discussed the methods, approaches and procedures used in the study. It detailed the study design, sampling technique employed and the description of the eleven bibliographic databases that formed population of the study. Identification of the sources, formulation of search strategy and evaluation of search results formed data collection method and procedures. The research resources, that is, computer, word processor, JKML library resources, Herzing's

Publish or Perish Software, Microsoft Excel and Tableau were also listed in this chapter. In addition, this chapter discussed how data was collected, aggregated, cleaned, evaluated, and presented. Finally, the study's ethical considerations were explored.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the analysis, results, and discussions of findings from the eleven purposively selected bibliographic databases from the period 2014 to 2018. The results were anchored on the study objectives and research questions. The presentation of the results was organized in the following themes:

- Trend of knowledge sharing research publications from 2014 to 2018.
- Types of knowledge sharing research publications.

- Subject contents of knowledge sharing research publications.
- Nature of authorship of knowledge sharing research publications.
- Proposed knowledge sharing framework for higher education institutions in Kenya.

To extract data from the eleven selected bibliographic databases, Herzing's Publish or Perish Software (Sept. 2019 version) was used. Extracted data sets was then exported to Excel spreadsheet for manual cleaning to remove the duplicates and outliers. Clean data was then organized in tables and transformed in the graphical charts and graphs.

4.2 Knowledge Sharing Research Publication Trend from 2014 to 2018

The number of publications published is one of the most important indicators for determining the degree of growth of publications over time and determining the most productive year of publishing. This study focused on a five-year period between 2014 to 2018. To realize objective one, the results from the bibliographic database structured and manual search were analyzed, as shown in Table 1, 2 and Figure 4 below. With the exception of 2016, the trend in knowledge sharing research was gradually increasing from 2014 to 2018.

Table 1: Year-wise Publication Output

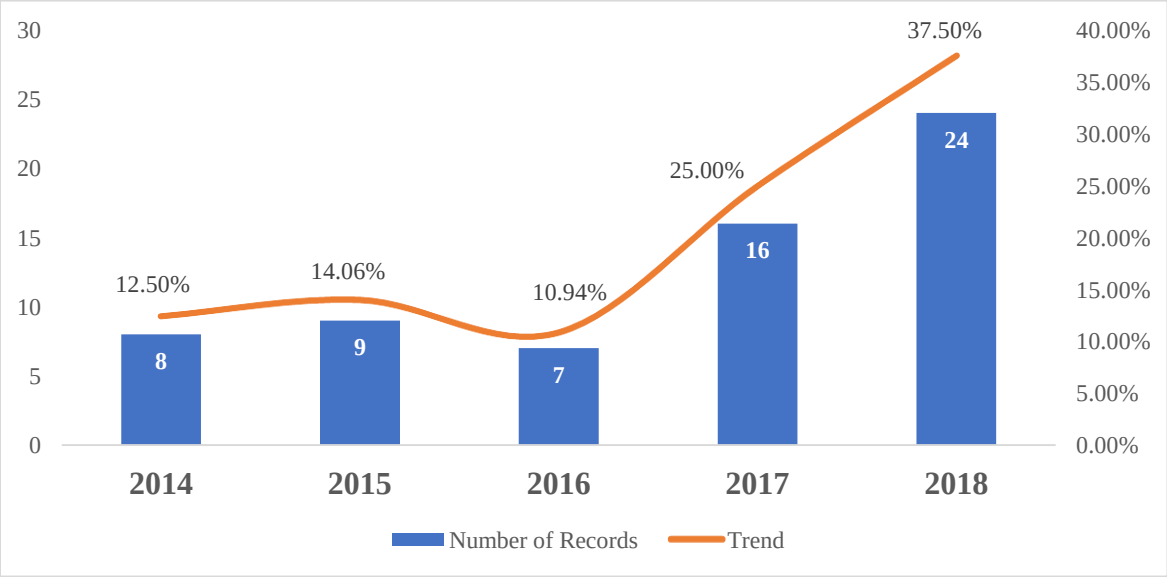
DATABASE	YEAR OF PUBLICATION				
	2014	2015	2016	2017	2018
Web of Science	-	-	-	-	-
Scopus	3	2	3	5	7
Emerald	-	1	-	1	1
PubMED	2	2	1	3	5
JSTOR	-	-	-	-	-
Elsevier	-	-	-	-	-
EBSCO Host	-	-	-	-	-
SpringerLink	-	-	-	-	2
ERIC	-	-	-	-	-
Google Scholar	3	4	3	7	9

AJOL	-	-	-	-	-
TOTAL RECORDS	**8**	**9**	**7**	**16**	**24**

Table 2: Year-wise Growth of Knowledge Sharing Research Articles Published

Year	Number of Publications	Trend (%)	Growth Rate	Average Growth Rate (%)
2014	8	12.50	0	0.00
2015	9	14.06	1	6.25
2016	7	10.94	-2	-12.50
2017	16	25.00	9	56.25
2018	24	37.50	8	50.00
Total	**64**	**100.00**	**16**	**Average = 20.00**

Figure 4: Year-wise Trend of Publications



The trend in publication output of the eleven bibliographic databases is shown in the Table 1 & 2 and Figure 4 above. Only four of the eleven databases used for the study, Scopus, Emerald, PubMed, and Google Scholar, had knowledge sharing research literature during the study period. The search for the rest yielded no results. The year 2018 was the most productive year in which 24 (37.50%) of the knowledge sharing articles were published. This was followed by next majority 16 (25.00%) in the year 2017. With 7 articles, 2016 had the lowest number of papers published (10.94%). As shown on the graph, there was a steady increase between the year 2016 and 2018. The most significant rise of the documents published was between 2016 and 2017 with a difference of 9 publications representing 14.06% increase.

Largely, there was an increase in knowledge sharing research publications in the years of the study. Based on the outcome of knowledge sharing, Connelly et al. (2012) predict that studies in knowledge sharing will increase in the next few years as a result of self-focused intentions. This is supported by Ahmad and Karim's (2019) study, which looked at the future research directions on knowledge sharing. Further, their study also revealed an upsurge in different aspects of knowledge sharing research during the last two decades in their study. This increase was attributed to the complexity of knowledge sharing brought about by individuals, institutions and intricate factors that necessitated research to identify those factor that impede or enhance it (Connelly et. al., 2012). Specifically, education and training programs in knowledge management in Kenya have increased in the last 5 to 7 years (Kwanya, 2019). Many Information Science schools and departments were started in 2005. As of 2017, there were 19 institutions in Kenya offering training in information sciences (Kwanya, 2018). Correspondingly, this increase has led to more students enrolling in knowledge management courses or training thus more research output.

Averagely, there was a 20.00% growth of knowledge sharing research publications from 2014 to 2018. There was an exponential growth of 56.25% between the years 2016 and 2017, the highest of all the years of study and 36.25% above the average growth rate. Conversely, 2016 was the only year that had a negative growth rate of negative 12.5 percent. This fluctuation in the growth pattern is no surprise, in fact, Chakravarty and Sharma (2017) and Ramiah-Santha (2016), in similar studies observed that no publication can maintain a steady growth pattern in every year.

4.3 Types of Knowledge Sharing Research Publications

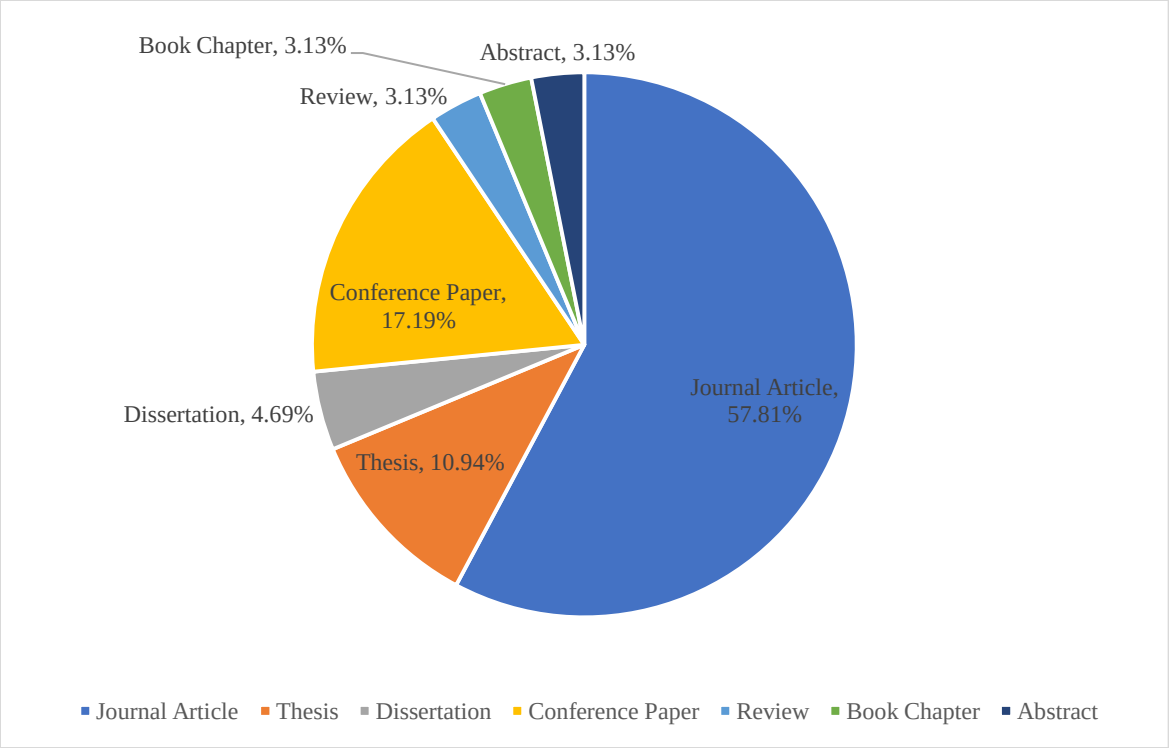
As shown in Table 3 and Figure 5 below, various types of knowledge sharing publications such as journal articles, theses, dissertations, conference papers, reviews, book chapters and abstracts were collected from identified databases during 2014 to 2018. The primary source was journal articles with 37 (57.81%).

Table 3: Types of Knowledge Sharing Research Publications

Types of Publications	**Scholar**	**PubMed**	**Scopus**	**Springer Link**	**Emerald**	**Total Per Article**	**Percentage (%)**
Journal Article	11	12	9	2	3	37	57.81
Thesis	7	-	-	-	-	7	10.94
Conference Paper	2	1	8	-	-	11	17.19
Dissertation	3	-	-	-	-	3	4.69
Review	-	-	2	-	-	2	3.13
Book Chapter	1	-	1	-	-	2	3.13
Abstract	2	-	-	-	-	2	3.13
Total	**26**	**13**	**20**	**2**	**3**	**64**	**100.00**

********Other databases have been discarded because they did not yield any results.*

Figure 5: Document Types of Knowledge Sharing Research Publications



In the second place was conference papers with 11 (17.19%), in the third place was thesis from higher education institutions with 7 (10.94%), and fourth rank is occupied by dissertations with 3 publications (4.49%). The last three document types - review, book chapter and abstract took fifth, sixth and seventh position consecutively with each having 2 (3.13%) publications. From the analysis above, journals articles are the leading sources of scholarly publications. This has also been confirmed by other related studies by Ocholla (2007), Ocholla and Ocholla (2007), Onyancha (2007) and Sitienei and Ocholla (2010).

Journal articles topped the list perhaps because of the research grants for academic institutions support by international organizations such as United Nations Educational, Scientific and Cultural Organization (UNESCO), and other UN bodies. Also, as a requirement by Commission for University Education in Kenya, lecturers and scholars are required to publish in reputable, peer-reviewed journals (Kigotho, 2017). Conference papers followed because of the annual conferences on knowledge management organized by a consortium of universities to encourage scientific knowledge sharing in Kenya. Examples include: Annual Conference on Information Science organized by the University of Nairobi, and International Conference on Information and Knowledge Management organized by Technical University of Kenya and Moi University. Such conferences call for papers from students and scholars on selected knowledge management

subtopics/themes such as knowledge sharing. Thesis and dissertation formats took third and fourth places consecutively. This study having focused on higher education institutions affirmed that publication from institutional repositories (IR) in Kenya would show up especially those curated by the Google Scholar database.

4.4 Subject Content of Knowledge Sharing Research Publications

Table 4: Subject Areas Covered in Knowledge Sharing Research

Subject	Frequency	Percentage (%)
Information Sciences	11	17.19
Health Sciences	8	12.50
Public Health	7	10.94
Agriculture	6	9.38
Social Sciences	5	7.81
Medicine	4	6.25
Economics	4	6.25
Business/Entrepreneurship	3	4.69
Education	3	4.69
Computer Science/Engineering	3	4.69
Information Technology	2	3.13
Geography	2	3.13
Management	1	1.56
History	1	1.56
Chemical Engineering	1	1.56
Project Management	1	1.56
Natural Sciences	1	1.56
Food Science & Technology	1	1.56

As reflected in the Table 4 above and Figure 6 (word cloud) below, majority (17.19%) of the articles published were of Information Sciences subject. This is followed closely by Health Sciences articles (12.50%), Public Health (10.94%), Agriculture (9.38%). The least number of

the subject contributions were Information Technology, Geography both having 2 (3.13%), and from Management, History, Chemical Engineering, Project Management, Natural Sciences, Food Science & Technology, with each having only 1 (1.56%) article published.

Figure 6: Frequency of Subjects Covered in Knowledge Sharing Research Publications

***https://monkeylearn.com/word-cloud/result* (Word Cloud)**

Information Sciences subject topped the list mostly because in the early years, knowledge management was taught as a specialization in information sciences courses among other options such as library sciences, records and archives management and media and publishing (Kwanya, 2018). According to Hosier (2019), most researchers tend to conduct studies in areas of their specialization and most important subjects that they are familiar with. Over the years, knowledge management has emerged as a standalone field. Knowledge sharing was hence birthed as a subset of broader knowledge management discipline. In examining intellectual structure of knowledge management, Subramani, Nerur and Mahapatra (2003) discoursed that knowledge sharing is a multidisciplinary field. It's contribution spreads through many areas such as computer sciences, library and information science, management sciences, social sciences, business, organizational science, psychology and planning and development. This explains why

there were many other research publications spread across various subject areas as observed in Figure 5 above.

Similarly, the high frequencies recorded by other subjects such as health sciences, public health, agriculture and social sciences are indicative of problems facing Kenya in the recent past. According to World Health Organization (2019), many Kenyans live below the poverty line because they spend most of their resources to pay for health services (refereed as 'out of pocket expenditure'). The Kenya household health expenditure and utilization survey (2018) findings cited public health as a major concern for many Kenyans (Salari, di Giorgio, Ilinca, & Chuma, 2019). This is also backed by data from Centre of Disease Control and Prevention (2017), which shows Kenya having high burden of infectious diseases such as HIV, tuberculosis, malaria coupled with high maternal and child mortality. Kenya is also facing severe food in security as a result of persistent droughts, locust menace, high food prices and the displacement of farmers as a result of the post-election violence in 2007 (Word Bank, 2019 and USAID 2017a). In addition, the reason for high number of health sciences publications can be attributed to the contribution of the PubMed database, whose main focus is medical subjects. Out of the total 64 publications, PubMed contributed 13 (20.31%) articles.

4.5 Nature of Authorship

Authorship patterns reveal the distribution of articles among single author or different authors. Authorship pattern is a key indicator used to analyze the degree of collaboration of the authors in a particular discipline of study.

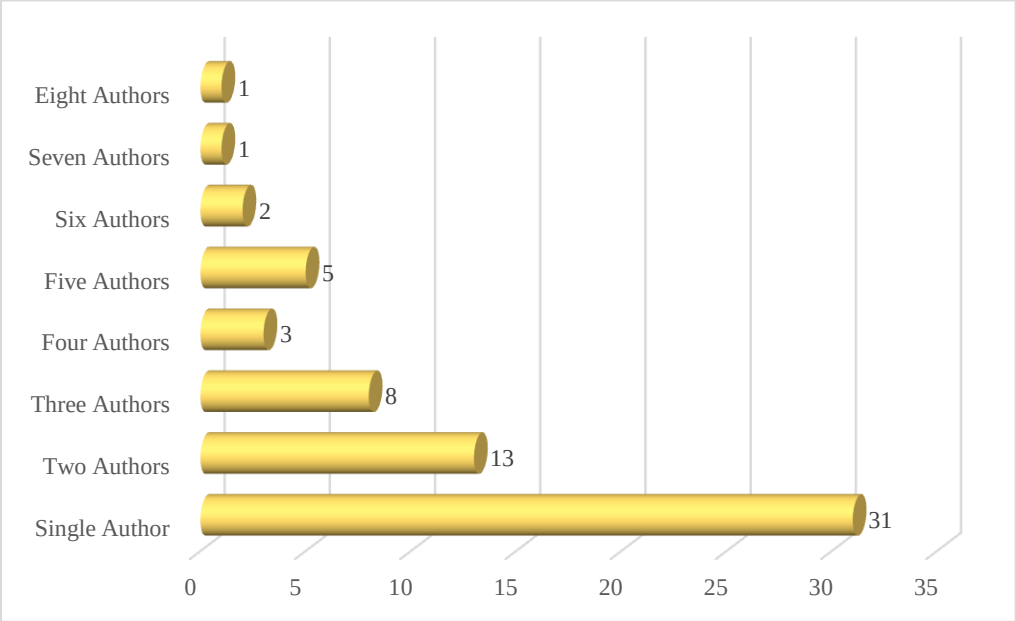
Table 5: Authorship Patterns

Author	Total	Percentage (%)
Single Author	31	21.38
Two Authors	26	17.93
Three Authors	24	16.55
Four Authors	12	8.28
Five Authors	25	17.24
Six Authors	12	8.28
Seven Authors	7	4.83
Eight Authors	8	5.52
Total	**145**	**100.00**

Table 6: Numeric Authorship Patterns by Year/Volume

Year	Author Per Article								Total No. of Articles	Total No. of Authors	Authors /Article
	One	Two	Three	Four	Five	Six	Seven	Eight			
2014	4	2	1	-	-	-	-	-	7	11	1.57
2015	4	2	1	-	1	1	-	-	9	22	2.44
2016	3	2	2	-	-	-	1	-	8	20	2.50
2017	9	3	2	1	1	-	-	-	16	30	1.88
2018	11	4	2	2	3	1	-	1	24	62	2.58
Total	**31**	**13**	**8**	**3**	**5**	**2**	**1**	**1**	**64**	**145**	**2.27**

Figure 7: Authorship Patterns Per Article



As shown in the Table 5 & 6 and Figure 7 above, the highest 31 (48.44%) of articles were single authored followed by joint authorship with 13 (20.31%) publications. Three authors take the third place closely followed by five authors with 8 (12.50%) and 5 (7.81%) articles respectively. The trend is followed by four collaborating authors with 3 (4.69%) and six collaborating authors with 2 (3.13%). Both seven and eight authored articles came last with each having 1 (1.56%) article. On average, there were two authors per article. Therefore, from the above analysis it can be deduced that knowledge sharing research is much dominated by single authors. This may be explained by the fact that most of the publications were from individual students, who are

required to publish before they graduate in higher education institutions. Collaboration in research areas is mostly prominent with the seasoned scholars than the inexperienced.

Figure 8: Authors per Year

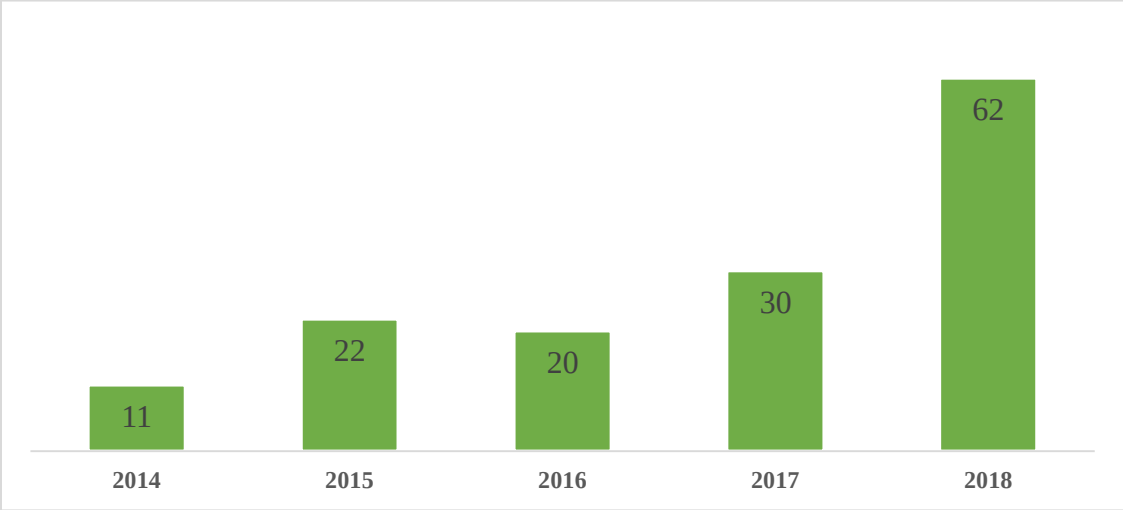


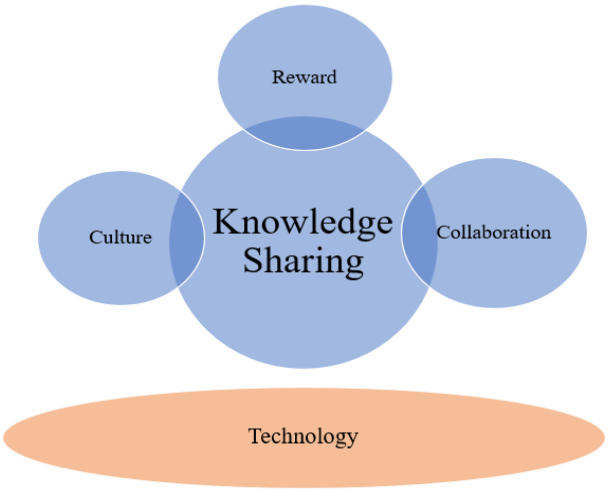
Figure 8 above shows an upward trend in collaborative authorship across the years. Over the years, it is evident that there was a tendency among the authors to work in collaboration. Even with this upward trend, research collaboration in higher education institutions is still weak despite the huge benefits it accrues. Some of the benefits as stated by Katz and Martin (1997) are knowledge and skills transfer, cross-fertilization of ideas, intellectual companionship, potential visibility of the work and wider network of the scientific community.

Prior researcher experience is also critical to the quality of the research output. Thus, inexperienced researchers tend to face administrative and logistical challenges related to collaboration work (Blevins et, al., 2010). Likewise, Muriithi et. al, (2018) in their study, concluded that low investment in funding research, competition among local universities, inadequate policies and weak links within the industry were main factors that contributed to low collaborative research in Kenyan universities.

4.6 Proposed Knowledge Sharing Framework for HEI in Kenya

Higher education institutions in Kenya play a key role in knowledge creation mainly through the research shared through different forms of publications. This not only enhances decision-making but also supports teaching and training programs. Thus, universities need to adopt an explicit approach that will control and optimize the way knowledge is shared. Based on Maidin and Izhar (2018) framework and the findings, this study proposed a knowledge sharing framework based on four factors namely reward, culture, collaboration and technology. The four factors are summarized in the figure below.

Figure 9: Proposed Knowledge Sharing Framework for HEI in Kenya



Knowledge Sharing Framework for Higher Education Institutions in Kenya

4.6.1 Reward

In universities, rewards are one significant component that can improve knowledge sharing among faculty, students, and non-teaching personnel. O'Dell and Hubert (2011) argued that knowledge sharing actions need to be rewarded and recognized. These rewards could be intrinsic (intangible) or extrinsic (tangible/physical). Intrinsic rewards are internal satisfaction one gets after achieving something. On the other hand, extrinsic rewards are external in nature, and mostly form various university employee compensation programs for academic achievement. In reference to this, Okoli (2020) conducted a study in three public universities in Nigeria regarding

reward management and employee performance. The results revealed that the there was a significant positive relationship between performance of employees in the universities studied. Similarly, Ndungu (2017), in his study on the effects of rewards and recognition on work performance at Kenyatta University, found a positive relationship between reward with the performance of the employees. Comparing the research output of similar study in Kenya and Nigeria, Amusan (2020) shows Nigeria has double number of publications in the same year as compared 64 publications that were found in this study. In Africa, most universities with higher research output have a reward management system. For example, Stellenbosch University in South Africa rewards its most productive researchers with incentives to boost publication rates (Johnson, 2011).

However, Muthama and Sioux (2021), contest that this approach breeds quantity rather than quality of research as well as rise to voracious publishing and resentment among academics. This study suggests that both forms of rewards should be encouraged among the university staff and students to optimize knowledge sharing. Incentives alone cannot be used to encourage publishing as withdrawal can lead to reduced publications, rather, this should be promoted alongside personal satisfaction one gets from the publishing or achieving a task or a milestone.

4.6.2 Culture

Information sharing is behaviorally reliant, therefore, institutional culture either fosters or restricts how individuals share knowledge. Universities that support and foster interdepartmental collaboration through interdepartmental assignments improve their ability to produce, use, and share information. The three cultural elements are values, norms and practices. These elements have a direct impact on the behaviours that promote knowledge sharing and use (Park, Chae, and Choi, 2017). Values are a set of conducts or principles that guides an institution such as, teamwork, professionalism, integrity and innovation. Norms are what universities believe and prescribed behavior. When norms are socially repeated or made a routine, they become practices. Consequently, there must be an interplay between these three elements for knowledge sharing capability to be sustained in any higher education institution.

4.6.3 Collaboration

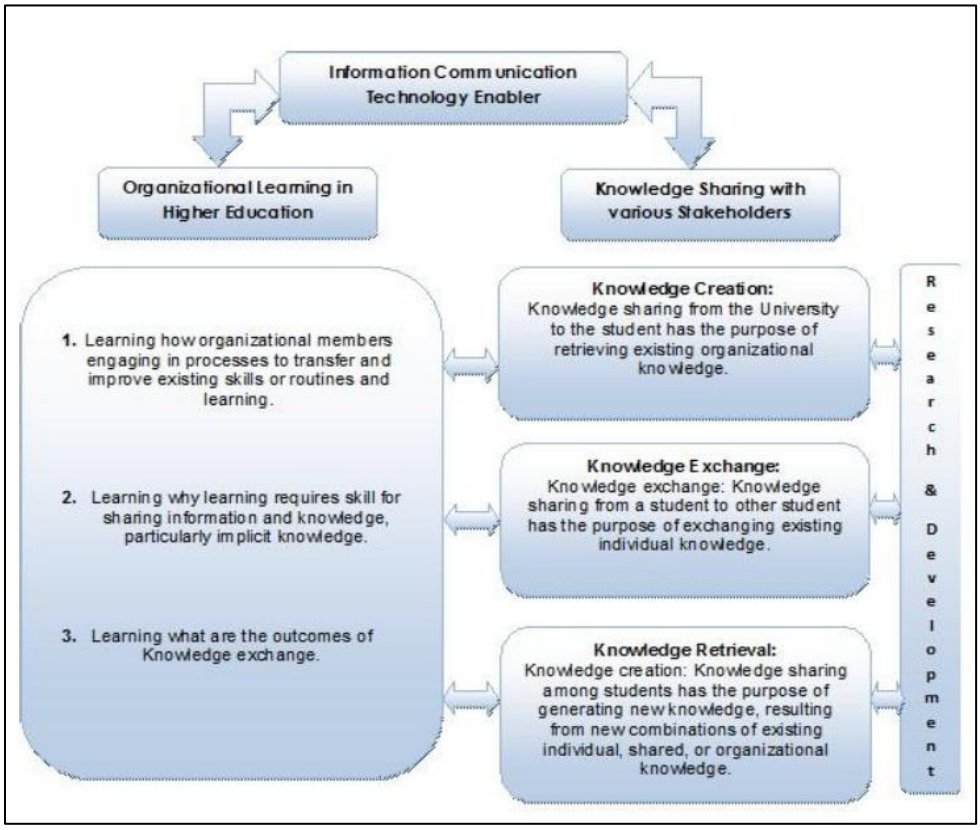
Collaboration as defined by Emden, et al. (2006) and Nina Evans (2012) is a process of cross-organization linkage to achieve a common purpose or business benefit. Collaboration can be approached by converging communication and trust between and among the parties involved (Kottila and Rönni, 2008). With respect to the idea of collaboration, Husain, Syam, Samdin, Nurwati & Husin (2017) claim that knowledge grows through discussions, face-to-face communication, institution-industry interaction as well as faculty development program. They further urged that academic institutions need to align their process, practices and human resources in a manner that promotes and enhances collaborative knowledge sharing. This type of collaboration encourages exchange of ideas between departments and schools, where students or lecturers can partner in task dependent activities such as research projects, research week, seminars and workshops. In this study, even though most of the publications were single authored publications, data also shows that collaborative authorship is growing. Studies by Lee and Bozeman (2005) and Gazni and Didegah (2011) show that the quantity and quality of research is positively associated with co-authorship. Likewise, the findings of a qualitative study conducted by Zuo, Zillante, Zhao, and Xia (2014), show that projects with consolidative, cooperative and people-oriented collaborative culture, performed way much better than others in most of aspects of project outcomes such as functionality, process and overall performance. In fact, Berasategi, Arana, and Castellano (2011) added that "trust amongst all network agents is the cornerstone of collaboration, and therefore, there is a demand to promote a collaboration culture based on fostering human relations." Thus, higher education institutions need to put in place structures and systems that encourage and promote collaboration among the students, lecturers as well as non-teaching staff. This can be summed up by a famous African proverb - "If you want to go fast, go alone; but if you want to go far, go together".

4.6.4 Technology

Technology facilitates the collection, management and transfer of knowledge. The term includes a wide variety of technologies such as computers, mailboxes, telephones, databases, internet and video conferencing tools (Sefollahi, 2018). Technology plays a critical role in knowledge sharing process and especially during the COVID-19 period, where social distance is mandated (Budd,

Manning, Lampos, Zhuang & McKendry, 2020). In fact, Dalkir (2016) argued that due to globalization of the world, technology-mediated knowledge sharing is unavoidable. According to Mahapatra and Sarkar (2000) and Zyngier (2003) appropriate information technology is a prerequisite for effective knowledge sharing as it plays a critical role in knowledge capture, storage and management. In particular, managing and sharing both explicit and tacit requires a significant investment in technology (Hansen, Nohria and Tierney, 1999). In universities, for example, technology such as Survey Monkey, Google Survey, Microsoft Forms can be used in data collection research projects while Microsoft Teams, Zoom have been used as a platform for teaching, dissemination of research findings and even holding conferences, seminars and workshops. Young (2010) listed these technology-mediated knowledge sharing tools as blogs, virtual community of practice, discussion forums, chat rooms, expert locators, collaborative virtual workspaces, knowledge portals, video sharing, and document libraries. In today's digital era, knowledge is instantly served through text messages, infographics, podcasts, review sites and video-streaming sites (Goyal, 2018). A recent quantitative study of 217 knowledge workers by Castaneda and Toulson (2021) concluded that ICT tools are key in facilitating the sharing of tacit knowledge. They, however, noted that tools that allow dialogue such as text messaging and video conferencing were most effective in knowledge transfer. In conclusion, Ryhan and Mohammed (2013) in their study, on the role of technology and its facilitation of knowledge in higher education proposed conceptual framework for using technology to enhance knowledge sharing in higher education. In their framework, summarized in Figure 10 below, they explain the interplay between higher education process, knowledge sharing enabling ICT, knowledge sharing processes, and knowledge sharing outcomes.

Figure 10: ICT and Knowledge Sharing Framework for Higher Education Institutions



Note. Adopted from Technology Role in Higher Education and Its Impact on Knowledge Facilitation, by Ryhan and Mohammed, 2013, p.194

4.7 Chapter Summary

This chapter presented the analysis and interpretation of data. As revealed, there is an increase in knowledge sharing research output across the years 2014, 2015, 2016, 2017 and 2018. The data also showed that most publications were single authored. Information science discipline contributed most of the knowledge sharing research publications in Kenya. Finally, in this chapter, rewards, culture, collaboration, and technology form key element of knowledge sharing framework in Kenyan universities. The next chapter presents the summary of these findings, conclusions as well as the recommendations for further research.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents a summary of the study findings as well as conclusions and recommendations. The study sought to examine the research trends of knowledge sharing in higher education institutions in Kenya between 2014 to 2018 using an informetric approach. In order to fulfil this purpose, research objectives together with the research questions were formulated. This chapter summarizes the findings as per the objectives. Further, the chapter provides recommendations on how knowledge sharing research can be improved in higher education institutions in Kenya. In particular, it provides recommendation to the scholars, students, lecturers, university management and the government of Kenya. Lastly, the chapter makes recommendations regarding untouched or under researched areas of knowledge sharing for future scholars who would like to conduct research in knowledge sharing.

5.1 Summary of the Findings

This section provides a summary of findings presented in line with the five research objectives. The summary was mainly informed by specific research questions that formed the foundation for data analysis, presentation and interpretation in chapter three.

5.1.1 Trend of Knowledge Sharing Research Publications from 2014 to 2018

The study on knowledge sharing research publication trend in a period of 5 years, that is 2014 to 2018, reveals that 2018 was the most productive year with the highest number of publications (24 research publications). The least productive year was 2016 with 7 publications only. The growth trend has been steady across the 5-year period with an average growth rate of 20%. However, a slight drop was observed between the year 2015 and 2016, where the number of research publication decreased from 9 to 7 respectively in line with the Chakravarty and Sharma (2017) and Ramiah-Santha (2016) observations. This steady increase was attributed to various reasons such as the emergence of the knowledge sharing topic that required scholars to conduct

research to identify those factor that either boost or suppress knowledge sharing among the higher education institutions. Also, as observed by Kwanya (2019), most information science schools have emerged in the past 5 to 7 years. This also includes the colleges that were also upgraded to university status leading to increased number of courses offered more so in the area of information science. Further, as observed in year wise publication trend Table 1, only five out of eleven databases yielded research publications in knowledge sharing. Those databases were Google scholar, Scopus, PubMed, Emerald and SpringerLink. The rest of the remaining six databases did not yield any publication from the search. Because of its free availability, its broad indexing capability and its high influencing capability (h-index) of current research publications, Google scholar had the highest number of publications of 26 across the years. Emerald and SpringerLink had the least number of publications of 3 and 2 respectively.

5.1.2 Types of Knowledge Sharing Research Publications

More than half of the research on knowledge sharing is published in external databases in the form of journal articles. Theses, dissertations, reviews, book chapters and abstracts were the least used forms of publishing. This is not surprising, as noted by Onyancha and Ocholla (2004), Onyancha, (2007) and Sitienei and Ocholla (2010) in similar studies. By the fact that this study focused on higher education institutions, one would assume that theses and dissertations would top the list. That was not the case for the reasons that not all theses and dissertations published in institutional repositories were submitted in the high impact journals. Just a few end up in international scientific indexing (ISI) journals. This could be attributed by the journal subscriptions and publishing fees imposed by these publishing companies. And as noted by Matheka et, al. (2014), majority of the young and inexperienced researchers in low- and middle-income countries (LMICs) find the cost as limiting.

5.1.3 Subject Contents of Knowledge Sharing Research Publications

Information science subject featured in most the published knowledge sharing works. This is because knowledge sharing (a subset of knowledge management) was first introduced and taught by early information science school – Moi University (1988) in Kenya. Therefore, it follows that most researchers would publish in the areas that they are familiar with. The concept of knowledge sharing has since gained popularity in research since the discovery of Socialization,

Externalization, Combination and Internalization (SECI) model by Nonaka and Takeuchi (1995). Knowledge sharing has attracted interest among many scholars, who want to investigate factors that enable or impede it. In the second place, is health sciences closely followed by public health. It goes without saying, that health is among the top priority among Kenyans. In the current government administration manifesto, dubbed Big 4 Agenda, affordable universal health care is a key priority given high cost of access by most citizens. This is also confirmed by studies by World Health Organization and Centre for Disease Control and Prevention (WHO & CDC, 2019). This explains the focus on health and public health issues, and the need to find solutions to curb the pandemics. Agriculture as a subject too follows closely, and this can be linked to the recent drought in Kenya, and the need to achieve food security (also a priority in Big 4 Agenda). In the past decade, Kenya has been faced with drought and coupled with the locust infestation, which has affected agricultural production. Geography, management, history, chemical engineering, project management, natural sciences, food science & technology had the least focus among the publishers. My argument is that these subjects have low interest among researchers in Kenyan universities. Most of the young scholars and students choose the 'marketable' subjects that would earn them a living faster in the Kenyan's competitive job market. These subjects generally attract few students.

5.1.4 Nature of Authorship of Knowledge Sharing Research Publications

The highest number of knowledge sharing research publications were single authored. The co authorship trend came in the second place. While this was the case, collaborative authors accounted for a larger share (78.62%) of all the authors. The largest set of author collaboration for knowledge sharing research were eight. Generally, both single and collaborative authorship increased over the five years period of study. Regarding the degree of collaboration, it was observed that both single and collaborative authors shared almost equal number of papers – (single, 48%, collaborative, 52%). Across the years under study, the number of publications also increased simultaneously with an increase number of authors. Authors, who collaborated, accounted for a higher knowledge sharing research output as compared to single authors. On average, there were two authors per publication.

5.1.5 Knowledge Sharing Framework for Higher Education Institutions in Kenya.

The knowledge sharing framework applicable to the higher education institutions involves four factors - rewards, culture, collaboration and technology. Rewards should be both internally and externally motivated. Students, lecturers, scholars and including non-teaching staff should be willing to share knowledge in themselves. Also, university management, departmental heads should also introduce incentives to most productive students, or departmental members. For example, students with best researched term papers or lecturers, who are most productive can be sponsored in local and international conferences. In doing so, this can boost their morale. Secondly, institutional culture plays a major role in encouraging knowledge sharing. And culture is enshrined in the values and ethics disposition that institutions subscribe to. Culture can either impede or promote knowledge sharing. Top management and departmental heads need to build an open, transparent and trust culture that encourages free sharing of knowledge among students, lecturers, students, and non-teaching staff. Such a culture may include diverse and inclusive workplace program that makes everyone regardless of their status, tribe, position to feel equally involved and listened to. Thirdly, task collaboration/dependance within and across departments is critical as it encourages exchange of expertise and fresh ideas that promote innovation and competitive edge. Lastly, technology is a key driver and especially in the transfer of both explicit and tacit knowledge both internally and externally through university websites and institutional repositories. In this age of fourth industrial revolution, technology is shaping how staff in the universities work and relate to one another. Universities need to embrace the digital transformation journey to achieve and sustain competitive edge. A good example, the use of social media tools such as Facebook, Twitter, WhatsApp, LinkedIn and YouTube in promotion and learning content and teaching. Knowledge sharing capabilities can also be enhanced by emerging technologies such as the use artificial intelligence, the Internet of Things, and robotics in automation of learning processes.

5.2 Conclusion

There is growth in knowledge sharing research in higher education institutions in Kenya. As observed, collaborative authorship is steadily gaining traction, however, it is not adequate, and it

needs to be improved upon. Similarly, besides information sciences/management, collaborative authorship with researchers in other subject areas such as chemical engineering, project management, natural sciences and food science and technology should be encouraged. Higher education institutions need to dedicate more resources to research funding and in particular training in research publishing, sponsoring staff and students to conferences and workshops, subscription fee for the journals and promotion of reward programs. Finally, technology plays an important role in this knowledge-sharing process. As a result, universities in Kenya must increase their investment in it. This, in turn, will promote research output accessibility and readership.

5.3 Recommendations

Based on the findings, this study therefore recommends a refresher training of the university lecturers and researchers especially junior ones on publishing skills and including publishing requirements by different academic journals. Full training programs should be designed for students on research skills, publishing skills and publishing policies for various journals. This should begin with the orientation of the students on utilization of institutional repositories. To supplement this, the study recommends universities to promote open access through provision of reliable internet within and without the university premises through provision of data bundles to students. This will increase readership of the online journals. To showcase local research, we recommend the development of a national database. As it stands, knowledge sharing research works done by Kenyan scholars are spread in various regional and international databases. For more prolific researchers, they should also be encouraged to publish their research work in well-known academic journals such as Web of Science, Scopus, Emerald and EBSCO Host. Universities should increase the number of scholarly forums such as conferences, seminars, and workshops. Management in the universities can also sponsor staff and students to such knowledge sharing events so that they can showcase their work and develop their skills through peer learning. Furthermore, researchers in these schools should embrace collaborative research, particularly with researchers from other institutions, both regionally and globally. Such collaborations will not only enhance their research skills and professional growth but also improve their research visibility across the global map.

Universities in Kenya should participate in the national feedbacking forums and stakeholders' meetings organized by the National Commission for Science, Technology & Innovation (NACOSTI) that seek to improve the national guidelines for registration and regulation of researchers. Expressly, these universities need to advocate for increased funding for local research in higher education institutions, enhanced recognition of local researchers and extending research grant support for the graduate students and junior researchers. Finally, database owners should ensure that they provide full details of articles and including bibliographic information regarding the authors so that they are assessable to the researchers, who would want to use this information to advance their work.

5.4 Suggestions for Further Research

This study suggests that more research be done into the nature of collaboration, particularly inside Kenyan universities, regionally in East Africa, and worldwide around the world. In the realm of knowledge sharing, the focus should be on research output and inter-disciplinary collaboration networks. In addition, this study suggests that a more in-depth investigation of the effects of these collaborations on knowledge sharing research output and impact be conducted. Further, the study suggests an inquiry into the most prolific researchers in knowledge sharing in Kenyan universities, as well as regional and worldwide. In conclusion, research into the elements that influence local or worldwide publication, as well as the selection of the publisher.

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APPENDICES AND ANNEXES

APPENDIX I: INTRODUCTION LETTER

UNIVERSITY OF NAIROBI

FACULTY OF ARTS

DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE

Telephone: +254 20 318262, Ext. 28095
Telegram: Varsity
Fax: +254 20 2245566

P.O. Box 30197- 00100 GPO
Nairobi, Kenya.
dnjiraine@uonbi.ac.ke

Our Ref: UON/CHSS/DLIS/303/ C54/6692/2017

Date 4th April 2021

Director General,
National Commission for science, Technology & Innovation
P. O. Box 30623-00100, Nairobi

Dear Sir/Madam,

RE: RECOMMENDATION FOR VITALIS ADONGO: REG NO: C54/6692/2017

The above named is a bonafide student at the University of Nairobi undertaking a Master of Library and Information Science (MLIS). He is currently in the process of collecting data as part of the requirements for the course.

His topic is *"Evaluation of Knowledge Sharing Research in Higher Education Institutions in Kenya: An Informetrics Study"*.

Any assistance accorded to him will highly be appreciated.

Regards,

Dr. Dorothy Njiraine
Chairperson, Department of Library & Information Science (DLIS)

APPENDIX II: RESEARCH PERMIT

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **286510**

Date of Issue: **23/April/2021**

RESEARCH LICENSE

This is to Certify that Mr.. Vitalis Adongo Mwambasa of University of Nairobi, has been licensed to conduct research in Nairobi on the topic: EVALUATION OF KNOWLEDGE SHARING RESEARCH IN HIGHER EDUCATION INSTITUTIONS IN KENYA: AN INFORMETRIC STUDY for the period ending : 23/April/2022.

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APPENDIX III: A GUIDE TO CONTENT ANALYSIS

1. Identify the Research Question – (RQ1, RQ2, RQ3,RQ4 and RQ5)
    - Trend (growth) of knowledge sharing publications over the period of 5 years,
    - Various types of knowledge sharing publications,
    - The subject domains covered in knowledge sharing research publications.
    - Nature of authorship of knowledge sharing publications.
2. Choose a sample or samples for analysis - (11 identified bibliographic databases).
3. Determine the type of analysis - (Apply search strategy: 'Knowledge' OR 'Knowledge Sharing' AND 'Kenya').
4. Reduce the text to categories and or patterns (clean/remove mismatch journals).
5. Perform Statistical Analyses – (Guided by the research questions to be answered).
6. Map out the Representations – (Visualization of results)