THE USAGE OF REFERENCE MANAGEMENT SOFTWARE (RMS) BY POSTGRADUATE STUDENTS: A CASE OF KILIMANJARO CHRISTIAN MEDICAL UNIVERSITY COLLEGE, TANZANIA

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CERTIFICATION

The undersigned certifies that she has read and hereby recommends for acceptance by the Open University of Tanzania a dissertation entitled “The Usage of Reference Management Software by Postgraduate Students: A Case of Kilimanjaro Christian Medical University College, Tanzania” in partial fulfilment of the requirements of the degree of Master of Arts in Library and Information Management, Department of Media and Library Studies of the Open University of Tanzania.

…….

Dr. Lilian Isowe

(Supervisor)

……

Date

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DECLARATION

I, **Janeth O. Machange**, declare that the work presented in this dissertation is original. It has never been presented to any other university or institution. Where other people's works have been used, references have been provided. It is in this regard that I declare this work as originally mine. It is hereby presented in partial fulfillment of the requirement for the Degree of Master of Library Information Management (MLIM).

……..

Signature

……

Date

DEDICATION

This work is dedicated to my family; my beloved husband and my children.

ACKNOWLEDGEMENTS

I wish to express my gratitude to the Almighty God for providing me with health and strength throughout my studies. Special thanks should go to my supervisor, Dr. Lilian Isowe for her guidance, contribution and cooperation in the course of writing my dissertation. In addition, I am grateful to my workmates and colleagues for their encouragement, moral support, assistance and prayers throughout the years of study. Finally, I owe my great appreciation to everyone who helped the completion of this journey, may the Almighty God bless them all.

ABSTRACT

Reference Management Software (RMS) is a tool used to organize citations and references, and arrange citations in different styles for academic writing works. This study aimed to assess the usage of RMS by postgraduate students at Kilimanjaro Christian Medical University College. The specific objectives of this study were to identify the levels of awareness of postgraduate students about RMS; to examine its usage, and asses the challenges faced by postgraduate students when using RMS. The Unified Theory of Acceptance and Use of Technology underpinned the study, which utilized a mixed methods approach. The study involved 91 participants selected through simple random and purposive sampling techniques, and data were collected using questionnaires and semi-structured interview guides. Quantitative data were analysed using Statistical Package for the Social Sciences (SPSS) and the results presented using tables and figures. Qualitative data were analysed using the content analysis technique. The findings revealed that the respondents were slightly aware of RMS in scholarly writing through their lecturers. The Mendeley was the most commonly used RMS by postgraduate students. However, postgraduate students encountered challenges when using RMS, including limited skills and knowledge and inadequate information and Communication Technology (ICT) infrastructures. The study recommends that universities should provide comprehensive training, workshops, and seminars on Reference Management Software together with online instructional materials at institutional or departmental levels. Librarians should be equipped with the knowledge, and skills on how to use research tools to assist postgraduate students. Also, the University management should increase the number of qualified librarians and ICT personnel.

Keywords: Reference Management Software; Postgraduate Students; Citation Management Software; Research tools

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LIST OF ABBREVIATIONS AND ACRONYMS

ICT	Information and Communication Technology
KCMUCo	Kilimanjaro Christian Medical University College
MMED	Master of Medicine
RMS	Reference Management Software
UTAUT	Unified Theory of Acceptance and Use of Technology.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Reference Management Software, referred to as "Bibliographic" or "Citation Management Software", was developed to help authors manage their references and maintain consistency in referencing (Amrutha *et al.,* 2018). Reference Management Software is an important facet of scholarly communication. It guides referencing and proper citations of the references while communicating the research findings (Amrutha *et al*., 2018). Furthermore, RMS assists scholars to search, store and organize scholarly works (Fenner, 2010). This is equally to say that RMS leads scholars to find relevant literature and their meta-data for future use to organise citations and references per preferred style (Fenner *et al.*, 2014). It entails a systematic way of referencing given any format universally acceptable for referencing and citation. RMS serves towards collaborations amongst scholars in using databases, open access and other resources. It helps to gather, organise and import citations and metadata for various purposes such as facilitating in-text citations and sharing with other scholars (Gilmour & Cobus-Kuo, 2011). Adeyemi *et al.* (2020) add that RMS helps scholars avoid plagiarism and attribute the originators of the literature employed in the study.

According to Lonergan (2017), RMS enables users to store citations in a digital form either locally or via the online interface to organize and format bibliographies and in-text citations more efficiently. In the past, references and citations were indexed on cards and stored in boxes manually, which was tedious and time-consuming (Fenner

et al., 2014). Ultimately, with the emergence of RMS, open source and Web 2.0 technologies changed the demands of users with different needs and expectations. RMS increases the scholar's potential to enhance scholarly work quality. In academic and research institutions, students engage in writing research papers, reports, articles and assignments using reference management software packages as a time-saving tool for writing their works (Fitzgibbons & Meert, 2010).

1.2 Background information to the study

Reference Management Software (RMS), bibliographic software, citation management software or personal bibliographic file managers refer to word processing software that inserts references from all sources and resources into a document in the text and reference part. Lonergan (2017) states that, RMS is a digital system which installed locally or via an online interface. The system is used to organize research works, bibliographies and in-text citations. RMS includes EndNote, Mendeley, Zotero, BibTex, Qiqqa, Citavi RefWorks, Papers, JabRef and CiteULike. In the context of this study, RMS is application software designed to collect and discover relevant literature, automatically update publication datasets and insert them into documents to facilitate the generation of references. RMS has been used to store, find, organize and format references within the manuscript (Fenner, 2010). RMS works as a tool in which authors, researchers and scholars create a library to store references in a dataset (Osmani *et al.*, 2016).

RMS was first developed in the 1980s when these programs were initially marketed to researchers as a means of creating online indexes of personal print-article collections (Lorenzetti & Ghali, 2013). This surpassed the use of index cards to

organize references alphabetically against the style of choice of organizing references manually (Rakshikar, 2015). Researchers began to use RMS to collect, organize and maintain databases of all relevant reference datasets in their scholarly works (Gilmour & Cobus-Kuo, 2011). Currently, there are more than 25 RMS packages with extended versions and advanced features. They all facilitate the capture, organization and elimination of duplicate records from electronic databases. RMS has provided a new dimension for reference management in scholarly works. Therefore, RMS is of paramount importance to serve the major purposes that include creating, storing and organizing references, as well as creating bibliographies in a variety of styles with word processing or web-browser software integration (Gilmour & Cobus-Kuo, 2011).

RMS is a technique for organizing sets of references by labelling and generating references, citations, or bibliographies in a variety of referencing styles, including those of the American Psychological Association (APA), Vancouver, Harvard, and Chicago. RMS manages references from the web browser; extracts metadata from digital libraries, bookmarks and scholarly works; saves searches, filters search results; customizes the bibliographic information and integrates to web feeds such as Google Scholar, Web of Science, WorldCat, ArXiv, IEEEX plore and PubMed (Pettifer & Kell, 2008). Fenner et al., (2014) are of the view that RMS works to tag both personal databases and the socialization of references in a sharing mode; importing bibliographic information from library catalogues and other bibliographic data sources.

RMS allows students, researchers and academics to collect bibliographic references in a range of referencing styles and cite them properly, quickly, easily and effectively (Parabhoi et al., 2017). RMS helps to organize and import references from digital resources and share and interact with other scholars. RMS enables references to be easily accessed, sorted, and imported into a manuscript for a consistent reference section. Reference datasets can be tracked to guide individual scholars to edit and search other related references to build their reference libraries (Crotty, 2009). Therefore, the use of RMS supplements the time-consuming and difficult process of manually collecting and keeping reference information so as to arrange them consistently on cards. RMS usage is an essential entity in writing scholarly works and it raises a necessity for researchers, academics and students to use it and improve their integral goals of acquiring skills, knowledge, experiences and information.

RMS sets guidelines to organize, store, and share references with other scholars to find out more related literature and build a stronger benchmark of scholarly works. Apart from this realization of RMS software and its importance part, there are challenges that students face in using RMS in academic institutions. The studies by Carpenter (2012); Emanuel (2013), and Melles & Unsworth (2015) confirm that there are challenges in using RMS. These are complex attitudes, behaviour, laziness, lack of training, technophobia and old habits that influence people to use emerging technologies (Francese, 2013). Also, users of RMS in universities lack the necessary skills and knowledge on how to apply RMS in their work. Citing resources automatically from an online database or internet search engine requires some knowledge and skills (Carpenter, 2012). This is because some databases or internet

search engines possess incorrect or incomplete bibliographical information. Similarly, the nature of universities is characterized by either time limitations or a lack of virtual collaboration that could enable students, academics, and researchers to learn and use RMS.

Extant literature shows that the use of RMS by postgraduate students is limited and ineffective. The study by Melles and Unsworth (2015) revealed that postgraduate students were aware of RMS, though, its use was limited. Also, the study by Osmani *et al.* 2016) concedes that students organize their references in their own way without using RMS. Therefore, available literature shows that there is underutilization of RMS by postgraduate students in universities (Nitsos, Malliari, Chamouroudi, 2021).

Kilimanjaro Christian Medical University College is a private University college which was established in 1997 as a constituent college of Tumaini University Makumira. The college offers wide range courses of in health and allied sciences at different levels including diploma, bachelor's degree, Master and PhD degree programmes. The University became operational on October 1st, 1997 under the name of Kilimanjaro Christian Medical College. It comprises the Faculty of Medicine, Faculty of Nursing, Faculty of Rehabilitation Medicine, Institute of Allied Health Science, Directorate of Postgraduate Studies, Directorate of Research and Consultancies, Directorate of Library Services, and the Kilimanjaro Christian Medical Centre (KCMC) as a teaching hospital. The total number of students' enrolment by December 2020 was 1750 including postgraduate students, undergraduate students and non-degree students (KCMUCo, 2021). At the start of

each new academic year, KCMUCo provides foundation and orientation courses to postgraduate students and undergraduate/non-degree students respectively.

In particular, postgraduate students are oriented on the use of library resources and services information literacy, plagiarism, citations, referencing, and necessary Reference Management software for their academic endeavours. They are oriented on how to write research proposals, reports, and formatting procedures which involve citations and referencing using RMS. The foundation course is of paramount importance for postgraduate students. They learn what RMS is, how to use it, types of RMS, how to evaluate RMS and finally how to choose RMS. Realizing the importance of RMS in academic writing, this, study assessed the usage of RMS by postgraduate students at KCMUCo. The study addressed the minimal and ineffective usage of RMS and the challenges postgraduate students face in using RMS at Kilimanjaro Christian Medical University College in particular.

1.3 Statement of the problem

There are several advantages to using RMS which include creating and managing references and citations, interacting with other scholars and researchers online, accessing relevant literature, annotating scholarly works, importing metadata, citing from different references, accessing, organizing, and formatting references in the required format and storing references. A study by Fourie and Bakker (2013) reports a low level of RMS usage at the University of Parma in Italy. It is further reported that researchers, novice academics and students in academic institutions are reluctant to use it in their scholarly works (Adeyemi *et al.*, 2020).

Despite the KCMUCo library raising awareness about RMS and how to use it, little is known about the postgraduate students' use of RMS in their academic writing. Therefore, this study realized a need to assess the level of awareness, RMS usage, and challenges inhibiting students from using RMS for their academic work. Thus, this study assessed the usage of reference management software by KCMUCo postgraduate students. The study sought to provide a better understanding of the problems associated with RMS and propose interventions so that more deliberate efforts can be made to improve students' usage of the RMS in universities.

1.3 Research Objectives

1.3.1 General Research Objective

The general objective of this study was to assess the usage of RMS by postgraduate students at Kilimanjaro Christian Medical University College (KCMUCo).

1.3.2 Specific Research Objectives

The specific objectives of the study were:

i. To identify the levels of awareness of the postgraduate students on RMS.

i. To examine the usage level of RMS by the postgraduate students at KCMUCo.

ii. To assess the challenges facing postgraduate students in using RMS at KCMUCo.

1.4 Research Questions

i. What is the level of awareness of postgraduate students at KCMUCo on RMS?

ii. What is the usage level of RMS by postgraduate students at KCMUCo?

iii. What are the challenges facing postgraduate students in using RMS at KCMUCo?

1.5 Significance of the Research

This study contributes towards an understanding of the usage of RMS by postgraduate students in universities. The study was expected to shed some light on the usage of RMS and the challenges encountered by postgraduate students in the process of using RMS. The study creates awareness among the public concerning the types of RMS in use, trends in usage and challenges faced by users. Moreover, the results of this study contribute to the current knowledge and literature in the field of library and information science and stimulate further research on the application of RMS in higher learning institutions in Tanzania.

1.6 Operational Definitions of Key Terms

1.6.1 Reference Management Software

Refers to the software that enables users to store citations in digital form, either locally or via an online interface, to make organizing research and formatting bibliographies and in-text citations more efficient (Lonergan, 2017). In the context of this study, RMS is a package that organizes and sorts out citations.

1.6.2 Postgraduate students

Are the learners who possess a first degree and pursue higher degrees for more advanced qualifications such as a higher diploma, a master's degree and a doctor of philosophy.

1.6.3 A librarian

Is a person who is in charge of or works professionally in a library and is responsible for its management and services (Haider, 2021). In the context of this study, a librarian is an informational professional who serves academics and students with library resources and services.

1.6.4 A lecturer

Is a teacher who is qualified to teach at a higher learning institution. In Tanzania, a lecturer must possess at least a master's degree.

1.6.5 Usage

Is the way something is utilized or employed.

1.7 Scope and Limitations of the Study

The study focused on the usage of reference management software by postgraduate students. The study was conducted at Kilimanjaro Christian Medical University College. It observed the level of awareness, usage, and challenges postgraduate students faced when using RMS. The respondents in the study included lecturers, librarians, and postgraduate students.

The researcher experienced several challenges while conducting the study. The time to do research was inadequate since the researcher was conducting research while also working as a librarian. However, the researcher scheduled the time to make sure the research report was completed. Also, the respondents failed to return questionnaires on time due to the nature of their work. However, the researcher made an effort to follow up and finally managed to receive enough questionnaires with a response rate of 60 (87%).

1.8 Organization of the Dissertation

This research dissertation is divided into five chapters as follows:

Chapter One: Introduction

This chapter presents the background to the study, a statement of the problem, research objectives, research questions, and the significance of the study, the operational definition of key terms and the limitations of the study.

Chapter Two Literature Review

This chapter provides a comprehensive review of the theoretical and empirical literature pertinent to the study. Furthermore, the chapter identifies literature gaps and presents a theoretical framework to support the research topic.

Chapter Three Research Methodology

The methodology of the research is described in this chapter; which includes the research approach, research designs, target population, study area, data collection methods, data analysis, data quality control, and ethical considerations.

Chapter Four: Data Analysis, Presentation and Discussion of the Findings

This chapter presents data analysis, presentation and discussion of the findings.

Chapter Five: Summary of Findings, conclusion and recommendations

This chapter summarizes the key findings of the study, draws conclusions based on the results and provides recommendations for future research. Additionally, the chapter highlights the contributions of the study and identifies areas for further studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents literature that relates to this study under themes to include, awareness, types and usage of reference management software, and challenges faced by postgraduate students when using RMS. It provides insight into scholarly works to identify existing problems and gaps. The related literature covers both empirical and conceptual literature from scholarly journals, books, peer-reviewed books, encyclopaedias, dictionaries, theses, dissertations, and magazines. Finally, the theoretical framework that informed the study and the research gap is presented.

2.2 Awareness and Usage of RMS by Students and Researchers

Awareness has been acknowledged as an important factor determining the use of RMS. It explains the extent of RMS utilization in academic environments. However, the level of awareness varies as per the different localities, times and environments. Studies conducted by Pathak and Johnson (2018) show low awareness and use of RMS regardless of academic level, age, gender, race, ethnicity, field of study, and English proficiency. Furthermore, Lonergan (2017) conducted a study on RMS preferences, and the results indicated that multiple RMSs were in use with faculty preferring Zotero over the library-supported RefWorks. Also, more than 40 per cent of students did not use any RMS. These findings support the necessity of doing more research to establish the parameters of the RMS environment among faculty, with implications for support, instruction, and outreach at the institutional level.

Bugyei, *et al.* (2019) did a study on assessing the awareness and usage of reference management software among researchers of the Council for Scientific and Industrial Research Institutes. The results show that a majority of scientists are aware of RMS. However, the adoption and usage of these tools are low, and the percentage of non-usage was higher among the older scientists than the younger researchers. The study by Francese (2013) showed that the knowledge of RMS is high among the respondents, but their adoption is low.

There are numerous reasons behind RMS's poor utilization. According to Kent (2011), the poor utilization of RMS might be due to a lack of awareness among users of RMS as it is too complicated to use, too expensive to purchase, or too time-consuming to master. Also, it is difficult to learn, and users need citation practices. In the process, RMS may fail to detect inconsistencies that lead to incomplete reference data. In other words, RMS sometimes experiences missing components. In addition, Amrutha *et al.* (2018) discovered that insufficient training and a lack of technical support are some of the hurdles to using RMS among science research scholars at the University of Kerala. However, academic libraries are considered a major provider of education in the use of RMS programs (Osmani *et al.*, 2016). A study by Ram and Anbu (2014) revealed that library staff skills are mostly not perceived, therefore scholars are alone when they face reference management issues. This creates a separation between the library and the academics instead of fostering a mutual dependence. Hence, there is a necessity for interventions in the knowledge, skills and information of the librarians and scholars towards the importance and use

of RMS. This would help to create awareness among postgraduate students in using RMS to maintain the quality of scholarly works.

2.3 Types of Reference Management Software

There are more than 25 types of RMS on the market. However, very few RMSs are free to use, and most of them have high registration fees, making them very difficult to download and install on digital devices (Mead and Berryman, 2010). However, there are preferred and popular RMSs as follows:

Mendeley was developed in 2008 by a Web 2.0 start-up. Mendeley is free with academic social networks that can help organize research, collaborate with others online, and discover new research (Mendeley, 2018). Mendeley offers both desktop and web vision. It provides users with access to social features such as sharing references with other users or discovering research trends (The University of British Columbia, 2022). A study by Basu and Chandra (2015) concluded that Mendeley includes the importation of PDF metadata, automatic naming and filling of documents, and the opening of multiple PDFs in a single application.

Zotero: This was developed in 2006 by George Mason as a free open-source. According to Tomaiuolo (2007), Zotero is a user-friendly standalone package that allows one to attach PDFs as well as extract notes and highlight them. Furthermore, it has a power search facility, which allows users to stay up-to-date and add their notes, create tags, and link references (Kern & Weible, 2006).

EndNote: This was first released in 1988 by Thomson Reuters. EndNote is commercial bibliographic management software which can be used for site-licensed

by the institutions or by the individual. EndNote is used by millions of researchers to locate and download full-text articles from selected references, or groups of references, and it has more than 5000 bibliographic output styles (Basak, 2014). It is a desktop application that allows researchers to save search strategies and also to locate and download full-text articles from the selected references or groups of groups of references (Rapp, 2011).

RefWorks: This is an online research management, writing and collaboration tool that is designed to help researchers easily gather, manage, store and share all types of information, as well as generate citations and bibliographies. It is attractive because it is web-based, which means that users can access their accounts from anywhere there is the Internet, and they are not required to download any software (the University of Johannesburg Library, 2022).

Apart from that, there are software that are active and updated. These are scientific bookmarking onnotea, CiteUlike, BibSonomy, BibTeX, BibDesk and JabRef, Papers and Bookends, Citavi, and Qiqqa (Fenner et al., 2014).

2.4 Challenges Encountered by Students When Using RMS

Despite the many RMS options available to postgraduates of which some are free, paid by institutional license, or available at low cost, postgraduate students face some challenges in using RMS, such as; lack of awareness, knowledge, and skills, selecting the right RMS, dynamic changes in RMS and inadequate ICT infrastructure in academic institutions (Kent, 2011; Ram & Anbu, 2014; Amrutha *et al.*, 2018).

2.4.1 Lack of Awareness

Among the reasons why postgraduate students are reluctant to use RMS is a lack of awareness. Awareness is about knowing something that exists and can be utilized to monitor a certain situation. Studies show that most postgraduate students are not aware of the availability of RMS and its use in writing their scholarly works (Kent, 2011; Ram & Anbu, 2014). According to Speare (2018), the main reasons for not using a program included the time needed to learn the technology and the steep learning curve. Some students also indicated that they were not aware of what programs were available.

2.4.2 Lack of Knowledge and Skills

Knowledge and skills are very important aspects of facilitating the use of RMS means having more citation practices, detecting inconsistencies in entries, showing incomplete reference data, and missing components (Wahyuningsih, 2020). Also, the study conducted by Amrutha *et al.* (2018), on the use of RMS among science research scholars at the University of Kerala' revealed that some of the barriers to accessing RMS are insufficient training and a lack of technical support. Also, postgraduate students experience some difficulties selecting RMS because of the incompatibility of their operating systems with RMS software (Gilmour & Cobus-Kuo, 2011).

2.4.3 Dynamic Changes of RMS

Dynamic changes induced by the evolution of science and technology that hamper students' ability to cope are among the obstacles students experience when using

RMS in their scholarly works (Speare, 2018). The studies by Randall *et al.* (2008), Ollé and Borrego (2010), and Wu and Chen (2012) concede that RMS frequently changes and updates the software as well as interfaces, making postgraduate students reluctant to apply them because they are not user-friendly.

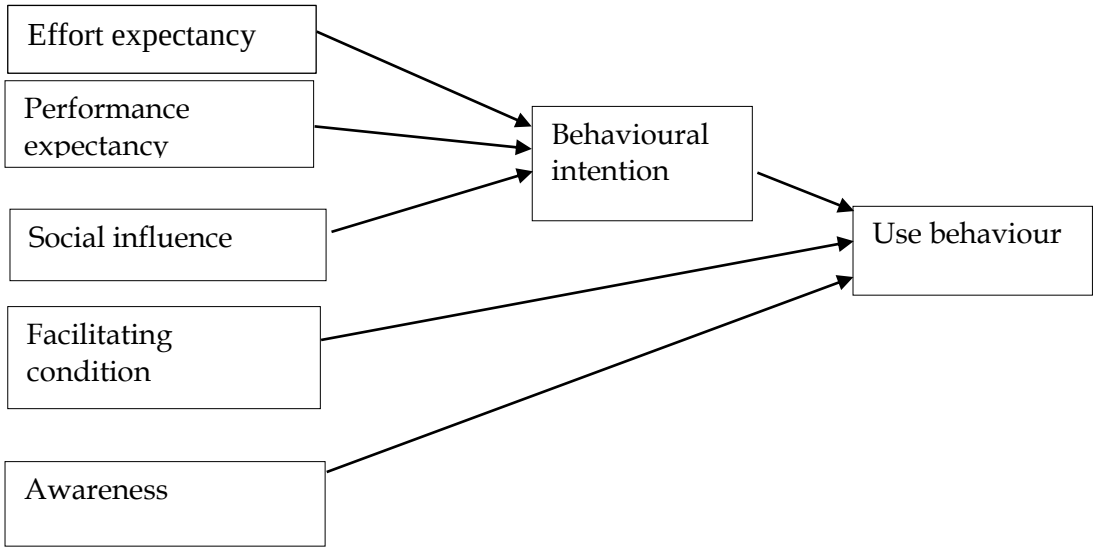
2.4.4 Lack of ICT Infrastructures

ICT has played a vital role in scholars' effective use of RMS. Through ICT, experts have managed to design, install, maintain, and fix operating systems efficiently. However, the essential infrastructure and networks to facilitate RMS use, transfer, and implementation are lacking in developing countries. Also, poor ICT infrastructure is the major cause of the stagnation of the use of RMS in Africa and other developing countries (Omekwu, 2003).

2.5 Theoretical Framework

Ravitch and Riggan (2017) defined the theoretical framework as a guideline that situates the relationship between variables and constructs to inform the study. It is an organized plan to guide the research processes and communicate new knowledge to other people, thereby contributing to existing practices and policies (Msabila & Nalaila, 2013). Thus, this study is informed by the Unified Theory on Acceptance and Use of Technology, which demonstrates variables and constructs on acceptance of technologies, the attitudes and behaviours of individuals in using technologies, and RMS in particular.

Figure 2.1: UTAUT theory by Venkatesh *et al.*, (2003)



Source: UTAUT Theory (Venkatesh *et al.,* 2003)

Because this study addresses the use of RMS, which is concerned with technologies, technophobic attitudes and behaviours of users of such technologies, there are several theories that might be used to inform studies related to the application of RMS by postgraduate students. These include the Innovation Diffusion Theory (IDT), Technology Acceptance Model (TAM), Theory of Reasoned Action, Model of Personal Computer (MPC), Social Cognitive Theory, and Theory of Planned Behavior (TPB) (Dwivedi *et al.,* 2011). In 2003, these theories/ models were consolidated into the Unified Theory of Acceptance and Use of Technology (UTAUT) to appropriately explain and predict the use of technologies. The study by Al-Qeisi (2009), on 'Analysing the use of UTAUT' observes that UTAUT as a consolidated theory, though initiated in western countries, its variables and constructs are applicable in other countries to include developing countries with slight variations.

UTAUT's variables include performance expectancy, effort expectancy, social influence and facilitating conditions, in tandem with constructs such as behavioural intention and actual technology use, which determines whether individuals use technologies or not.

Performance expectancy is when the user believes that technology will facilitate the accomplishment of a certain specific task of job performance. In the context of this study, performance expectancy is the expected benefit to which postgraduate students believe that the use of RMS helps them to improve/ simplify academic work.

The effort expectancy is the understanding that the use of particular technology-related applications would be easy to use (Venkatesh *et al.,* 2003). In the context of this study, it is the degree of ease of access and utilization of RMS. Social influence is a situation whereby the user decides to use a particular technology influenced by friends and family as well as important people in society. It is the degree to which postgraduate students perceive that their peers/ tutors believe they should use RMS in academic pursuit. Therefore, awareness of the use of RMS can be acquired from friends and colleagues as social influences.

The facilitating condition is the user's anticipation that there are available resources (organization and technical infrastructure) required for individuals to use a particular technology (Venkatesh *et al.,* 2003). In this study, it is the degree to which postgraduate students believe that institutional ICT infrastructural facilities and technical support are available to support access and use of the RMS. This can be

interpreted to mean the degree to which a postgraduate student believes that the university has an enabling ICT environment that facilitates access and use of RMS.

UTAUT was criticized for having numerous variables, constructs, and moderators that make it impractical in real life. Dwivedi *et al.* (2011) view that UTAUT initiated some constructs in behavioural intention and use of technologies assumed inapplicable in other contexts. Also, the reasonable predictive power demonstrated in the UTAUT can be achieved merely by another simple model (Li, 2020). Furthermore, the influence of individual characteristics on innovation is not addressed in UTAUT (Slade *et al.*, 2015).

This study context, it explains technologies in the context of substantive antecedents for individuals to accept and use RMS postgraduate students. Through its variables, the model forms integral patterns for using RMS in organizing citations and references by postgraduate students.

2.6 Research Gap

Many studies affirmed that some RMSs are free and accessible to postgraduate students. However, the utilization of RMSs is still very low (Melles & Unsworth, 2015; Francese, 2013; Adeyemi *et al.*, 2020). This can be attributed to University student's reluctance to use technologies in their learning process due to technophobia, lack of awareness, skills, and knowledge about the use of technologies (Mungwabi, 2018). Also, the University students encounter challenges associated with referencing styles, and technical support from librarians and lecturers (Bugyei *et al.*, 2019). However, extant studies on the usage of RMSs were undertaken in

developed countries with reliable infrastructure compared to developing countries. This leads to the missing link to explain the usage of RMSs in developing countries like Tanzania. Also, there is dismal literature about the usage of RMS in Tanzania. Therefore, the study assessed the usage of RMSs by postgraduate students at Kilimanjaro Christian Medical University College to fill knowledge and literature gap.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is the systematic way of solving the research problem, including all steps, processes, and procedures adopted by the researcher in the study (Kothari & Garg, 2014). This section explains the research methodology that this study used. It includes components like research design, area of the study, study population, sample size and sampling technique, data collection methods data analysis and presentation.

3.2 Research Design

The research design refers to a pathway in which the study is used during data collection, data analysis, and presentation (Salkind, 2018). It is a set of parameters to decide, locations, timeframe, respondents, sources, and methods for data collection, analysis, and integration of the study findings. It structures the research to show how all the major parts of the research hold together and work together as a framework to address the research objectives (Akhtar, 2017). This study used a cross-sectional research design. The design allows data collection to be done at a single point in time (Pandis, 2014). Cross-sectional studies are generally quick, easy, and cheap to perform (Levin, 2006). However, the method has limitations when it comes to establishing temporal associations between exposures (Pandis, 2014). Nonetheless, the data collected using the design does allow the establishment of relationships between variables (Saunders *et al.* 2009) thus the design was appropriate for the current study. This study, therefore, employed a cross-sectional design to assess the

levels of awareness, usage, and challenges encountered by postgraduate students when using RMS.

3.3 Research Approach

This study employed a mixed methods approach to assess the levels of awareness, usage, and challenges encountered by postgraduate students when using RMS. This is the kind of research approach whereby the researcher collects and analyses both qualitative and quantitative data, integrating the two forms of data and using distinct designs that may involve philosophical assumptions and a theoretical framework within the same study (Creswell, 2013). Shorten and Smith (2017) explained that the motives behind using a mixed approach are; that a mixed approach contains an element of both qualitative and quantitative approaches to utilize the benefits obtained from both. Secondly, neither the qualitative nor quantitative approaches are adequate in themselves to provide detailed and understandable information. The use of both provides understanding and complete analysis information, as stated by (Creswell *et al.*, 2004).

3.4 Study Area

This study was conducted at Kilimanjaro Christian Medical University College (KCMUCo). The college became operational on 1st October 1997 in collaboration with Kilimanjaro Christian Medical Centre (KCMC). It is situated 4 kilometres north of Moshi Municipality on the slopes of the snow-capped Mount Kilimanjaro, Tanzania. Kilimanjaro Christian Medical University College trains health

professionals of all cadres, ranging from diplomas, ordinary degrees, postgraduate degrees and doctor of philosophy.

KCMUCo was chosen to represent other medical universities because it is the oldest private university in Tanzania established in 1997, compared to others like the Catholic University of Health and Allied Sciences (CUHAS), which was established in 2003. Besides, KCMUCo offers a postgraduate programme that engages postgraduate students to produce scholarly work in the area of medical education that directly influences healthcare decision-making.

In addition, KCMUCo is an organized institution and has a conducive environment where the availability of data is easy for the researcher.

3.5 Population of the Study

A population is the complete set of individuals (subjects or events) having common characteristics in which the researcher is interested (Thwaites, 2020). The target population for this study was estimated to be 118, comprised of postgraduate students, lecturers, and librarians. Postgraduate students in the context of this study are those enrolled in master's and Ph.D. programs at the KCMUCo.

In this study, postgraduate students were selected as part of the population because of their active involvement in scholarly work. Also, lecturers are involved because they understand the use of RMS by postgraduate students, as they are the ones who teach and supervise them. On the other hand, librarians are assumed to understand the use of RMS by postgraduate students because they are the ones who provide services and research tools such as RMS to postgraduate students.

3.6 Sample Size and Sample Procedures

Sampling is the process of selecting a statistically representative sample of individuals from the population of interest (Majid, 2018).

The sample size for this study was 91 respondents, including sixty-nine (69) postgraduate students, fourteen (14) lecturers, and eight (8) librarians. These were randomly and purposively selected from the targeted population of 118. Due to the limited time to collect data from the population, the researcher employed a mathematical formula developed by Yamane in 1967 to get the sample size shown below.

$$n = \frac{\mathrm{N}}{1 + \mathrm{N(e)}^2}$$

Where;

n = sample size

N = the population size

e = Margin error of (0.05)

n=91.12

n=91

The simple size =91

3.6.1 Sampling Technique

According to Kombo and Tromp (2006), sampling techniques are used in selecting a suitable sample from the population to determine the characteristics of the whole population. This study used simple random sampling and purposive sampling.

Simple random sampling was used for the postgraduate students as it ensured an equal chance of the respondents being included in the study, reducing the researcher's biases in the sampling process.

Purposive is non-probability sampling where the researcher chooses the sample based on a certain purpose (Kothari 2004). Purposive sampling was employed to select lecturers and librarians for interviews because it was assumed that they possessed in-depth information about the usage of RMS. The method was chosen to ensure the inclusion of individuals who could provide comprehensive insight and detailed information concerning the usage of RMS.

3.7 Data Collection Methods and Instruments

The data collection method is the process of gathering research data about the research problem. This is done in a systematic way to enable statistical analysis. Research instruments are the tools used to collect data for research projects. There are various types of data collection, such as questionnaires, interviews, observation, documents, or record reviews (Dawson, 2002). In this study the following data collection methods and instruments were used;

3.7.1 Questionnaire

A questionnaire is a data collection method where an investigator has to prepare a similar set of questions in a definite order on a form (Kothari & Garg, 2014). The reason for using a questionnaire is that it enables the researcher to collect a large amount of data in a short period at a low cost. It is also free of bias. Also, the

questionnaire allows respondents to provide their thoughts and ideas about the given questions (Bickman & Rog, 2009).

Data was collected using semi-structured questionnaires; both closed-ended and open-ended questionnaires were distributed to 69 postgraduate students. The questionnaire was self-administered by collective groups of postgraduate students, such as in classes, morning reports and academic forums.

3.7.2 Interview

The interview is a method of collecting data that involves the presentation of oral-verbal stimuli and replies in terms of oral-verbal responses. It can be used through personal interviews or telephone interviews (Kothari & Garg, 2014). The interview method is used to collect information about one's knowledge, values, preferences, views, opinions and attitudes. It is also a quick way of obtaining detailed information.

This study used a semi-interview guide, including structured and unstructured questions, to collect data from the lecturers and librarians in the area of the study. The researcher made appointments with the respondents based on their convenience in terms of time and location. Hence, four librarians and eight lecturers were interviewed.

3.8 Data Quality Control

Data quality control refers to the efforts and procedures that a researcher puts in place to ensure the accuracy of collected data by using methodologies chosen for a

particular study (Dimitrov & Rumrill, 2003). In this study, a pre-test was used to ensure data quality control.

3.8.1 Pretesting of Research Instrument

Pretesting of research instruments is meant to ensure that the indicators yield the same results, irrespective of when or where they are applied. Neuman (2002) argues that research instruments need to be tested during their development and application for acceptability, feasibility, reliability, sensitivity to change, and validity. For the current study, pretesting of research instruments was undertaken before the main study. The pre-test on the clarity and suitability of the questionnaire was done on ten students, and the interview guide was tested on two librarians and two lecturers from KCMUCo. The respondents were randomly selected from the sampling frame for pre-testing the instruments. The feedback from respondents was observed to identify errors and repetitions in the questionnaires and interview guide. Then, the researcher corrected the instruments to maintain the validity and reliability of the findings.

3.8.2 Triangulation

Triangulation refers to the designed use of several different research methods, with offsetting or counteracting biases in investigations of the same phenomenon to strengthen the validity of the results (Neuman, 2002). By drawing data from sources, methods, and instruments that have very different potential threats to validity, it is possible to reduce the chance of reaching false conclusions. For this study, a combination of both quantitative and qualitative methods was used. Also, the study

used questionnaires with both structured and semi-structured questions together with an interview guide to collect data.

3.9 Ethical Consideration

Ethical consideration is a set of moral principles that offer rules and behavioural manners for conducting research (Neuman, 2002). Therefore, from the beginning to the end of the study, ethical issues were observed. The study aims were explained to the respondents, and consent forms were distributed for the respondents to read and sign. Before distributing the questionnaire and conducting interviews, the objectives of the study were elaborated for respondents, nobody was forced to participate in this study. Respondents were assured that all information collected would be kept confidential and for academic purposes only. Before data collection, the researcher requested and received a clearance letter from the Director of Research and Consultancy for Postgraduate Studies at the Open University of Tanzania (OUT). The clearance letter was used to obtain permission from the Regional Administrative Secretary (RAS) and KCMUCo, respectively, for the data collection process.

3.10 Data Analysis and Presentation

Data analysis is the process of summarizing and developing information patterns to examine if the data analysis is consistent with the research objectives and theories (Cooper & Schindler, 2014). This study used a mixed methods approach, which is a combination of quantitative and qualitative approaches. Mixed methods data analysis is an integrated data analysis process that uses statistical and content thematic analytic techniques (Tashakkori & Teddlie, 2008). Quantitative data were

analysed using Statistical Package for Social Sciences (SPSS) version 23, while qualitative data were analysed by content analysis. Brough (2019) defines content analysis as a research tool used to determine the presence of certain words, themes, or concepts within some given qualitative data. It is a systematic coding and categorizing approach used for exploring large amounts of textual information unobtrusively to determine trends and patterns of words used, their frequency, their relationships, and the structures and discourses of communication (Vaismoradi *et al.,* 2013).

Both quantitative and qualitative data were mixed up using explanatory sequential mixed methods. In this method, the researcher conducts the quantitative data analysis and builds on the results to explain them in more detail with qualitative data. It is considered explanatory because the initial quantitative data results are explained further with qualitative data. It is considered sequential because the initial quantitative phase is followed by the qualitative phase (Creswell, 2013).

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents data analysis, presentation, and discussion of the research findings based on specific objectives. The study was guided by the following research objectives; To identify the levels of awareness of the postgraduate students on RMS, to examine the usage level of RMS by the postgraduate students, and to assess the challenges facing postgraduate students in using RMS at KCMUCo. Data were collected through semi-structured questionnaires and in-depth interviews. The chapter is presented in sections including demography information, awareness, and usage of RMS and challenges of using RMS.

4.2 Demographic Characteristics of the Respondents

This part provides the background information of the respondents, which includes age, sex, and programme of the study. These variables were included in the study so that the researcher could extract various responses from the respondents and determine the relationship between the responses provided by the respondents and their demographic characteristics. Prior studies have suggested that demographic characteristics such as these can have an impact on academic explanations and performance (Refae *et al.,* 2021).

Table 4.1 indicates the age, gender, and programme of the study distribution of the respondents.

Table 4. 1: Distribution of Respondents by Gender, Age and Programme of their Study

Variable	Category	Frequency	Per cent
Gender	Female	23	38.3
	Male	37	61.7
Age	21-30	18	30.0
	31-40	40	66.7
	41 and above	2	3.3
Programme	Masters	55	91.7
	PhD	5	8.3

Source: Field Data (2021)

The gender distribution of respondents revealed that 37 (61.7%) were males and 23 (38.3%) were female. The findings indicate that the number of male postgraduate students was higher than females. This shows that males were the majority in the postgraduate programme compared to females. These findings concur with Balandya *et al*. (2022) who reported that the average proportions of postgraduate students who applied and were selected for 2019-2020 were 60% male and 40% female. Also, The Citizen (2018) reported that many Tanzanian girls make it to secondary school, fewer to university, and even less to postgraduate school.

In this part, respondents were required to provide age profile categories based on the age ranges of 21-30 years old, 31-40 years old, 41-50 years old and 51 and older. The findings summarized in Table 4.1 indicate that 40 (66.7%) respondents were between 31-40 years old, 18 (30.0%) respondents were between 21-30 years old, and 2 (3.3%) respondents were between 41-59 and above. The findings suggest that most respondents 40 (66.7%) belong to the age group of 31-40 years. This implies that the majority of postgraduate students are in-service because the education system of

Tanzania of 2-7-4-2-5-3+ leads students to join postgraduate studies at the age of 31 and above (Nuffic, 2015).

4.3 Awareness of Reference Management Software

The first objective of this study was to identify the level of awareness of the RMS among postgraduate students. The use of RMS is influenced by the level of awareness of RMS. The following subsection presents information about this objective.

4.3.1 General Awareness

This section sought to find out the general awareness of postgraduate students on RMS. The question was asked to check if postgraduate students were aware of RMS. From the findings, 60 (100%) postgraduate students were aware of the RMS.

Interviews with lecturers found that lecturers are aware of RMS as they teach their students how to use and install it on their devices. Though some lecturers stated that they knew RMS but not in detail. One of the lecturers had opinions that,

> *I know RMS but I can't use it properly as I am not aware of some of the features* (Interview with Lecturer A, 2022).

Generally, the findings revealed that the awareness of the RMS among postgraduate students and lecturers was high. The results concur with the study by Bugyei *et al.* (2019) which shows that the majority of postgraduate students, librarians, and lecturers were aware of RMS. In this study context, the results show that the majority of respondents were aware of RMS. This might be due to foundation

courses and training workshops provided by the college when students start studying. UTAUT theory views that awareness of the use of technologies is paramount for individuals to use them (Hewavitharana *et al*., 2021). Therefore, there is a great need to create some necessary interventions to create awareness among postgraduate students on how to use RMS.

4.3.2 Level of Awareness of RMS

The study assessed the level of postgraduate students' awareness of RMS. The respondents were asked to rate the level of awareness they have of RMS. The findings are shown in Table 4.2.

Table 4. 2: Level of Awareness on RMS

s/n	Description	Frequency	%
1	Slightly aware	33	58.6%
2	Somewhat aware	22	38.3%
3	Moderately aware	3	5%
4	Extremely aware	2	3.3%
Total		**60**	**100**

Source: Field Data (2021)

Table 4.2 shows that 33 (58.6%) postgraduate students had a slight level of awareness of RMS, 22 (38.3%) were somewhat aware, 3(5%) had moderate awareness, and, 2 (3.3%) of the respondents had an extreme level of awareness of RMS. The findings imply that postgraduate students are slightly aware of the RMS. This is contributed by the trivial amount of knowledge on RMS delivered during the foundation course. According to Adeyemi *et al.* (2020), there is a gap in awareness

and usage of reference management software. Subsequently, from the in-depth interview, the lecturer B explained that,

> *Foundation course introduces course content which helps postgraduate students to get an insight about the course. However, not enough to facilitate a high level of awareness of RMS.* (Interview with Lecturer B, 2022)

4.3.3 Source of RMS Awareness

The researcher wanted to obtain information regarding the various ways in which respondents became aware of RMS. The respondents provided the sources of their awareness as explained in Table 4. 3

Table 4. 3: Ways of the Respondents' Awareness of RMS. (multiple responses)

	Source of awareness	Frequency	Per cent
1.	Colleagues	31	51.7
2.	Librarians	9	15
3.	Self-study	28	46.7
4.	Lecturers	56	93.3

Source: Field Data (2021)

Table 4.3 indicates that many postgraduate students, 56 (93.3%), replied to having attained knowledge of RMS from lecturers, 31 (51.7%) from colleagues, 28 (46.7%) through self-study, and 9 (15%) through librarians. This implies that many postgraduate students become aware of RMS through lecturers. The findings from interviews indicate that lecturers introduce RMS to students during foundation courses. For example, one lecturer had this to say,

> *At the beginning of the new academic year postgraduate students attend foundation courses which aims to create awareness in their various program including research tools*. (Interview with lecturer C, 2022).

This was also observed in the KCMUCo prospectus (2021), which states that the foundation course acts as the preparatory programme that aims to create awareness of RMS and basic science knowledge and skills. However, the results that 9 (15%) of postgraduate students get assistance from librarians are contrary to the fact that librarians are solely the ones supposed to provide RMS knowledge and skills to postgraduate students. This is demonstrated by Francese (2010), who explained that librarians are the centre of expertise in managing bibliographies and citations and all matters related to research tools and RMS in particular. In general, it seems librarians are not performing their duties as per their professionalism. Childress (2011) views the lack of experience and comfort as consistent with many academic librarians. For understanding, UTAUT theory concedes that most librarians are not performing well in their respective fields because of their reluctance to use technologies (Venkatesh *et al.,* 2003). However, according to Speare (2018), some students prefer to learn on their own, while others would like more support. Most of the librarians who provide open-source software services to their patrons do not provide RMS services to their users (Ladkat & Lihitkar, 2019). According to Childress (2011), a lack of experience in RMS is consistent with many academic librarians. For understanding, UTAUT theory concedes that most librarians are not performing well in their respective fields because of their reluctance to use technologies (Venkatesh *et al.,* 2003). However, according to Spear (2018), some students prefer to learn on their own, while others would like more assistance.

4.4 The Usage of Reference Management Software

The second specific objective of this study was to examine the usage of RMS by postgraduate students. The objective was addressed through five sub-themes, as follows:

4.4.1 Types of Reference Management Software Used by Postgraduate Students

There are various types of reference management software tools available. The researcher wanted the respondents to identify the types of RMS they usually use. A list of some popular RMSs was provided, these include Zotero, Mendeley, Endnote, and Reworks, and respondents were asked to indicate the RMS they use.

Multiple response results are presented in Table 4.4.

Table 4.4: Type of Reference Management Software Used in Academic Works

	Type of RMS used	F	%
1.	Mendeley	38	63.3
2.	Zotero	12	20
3.	Endnote	26	43

Source: Field Data (2021)

The findings revealed that 38 (63.3%) postgraduate students use Mendeley software, 26 (43%) confirmed using Endnote software, and 12 (20%) use Zotero. Nonetheless, 3 (5%) confirmed that they are not using RMS when referencing. This shows that Mendeley software was popular with students and used in their scholarly work.

The researcher interviewed lecturers about the types of RMS used by postgraduate students.

One lecturer has this to say:

> *Most of the postgraduate students use Mendeley software in their scholarly writing though it seems like they have limited knowledge of these tools, we still encourage them to use RMS, because the manual system is very difficult to manage. (*Interview with Lecturer D, 2022*)*

Another lecturer has this to say;

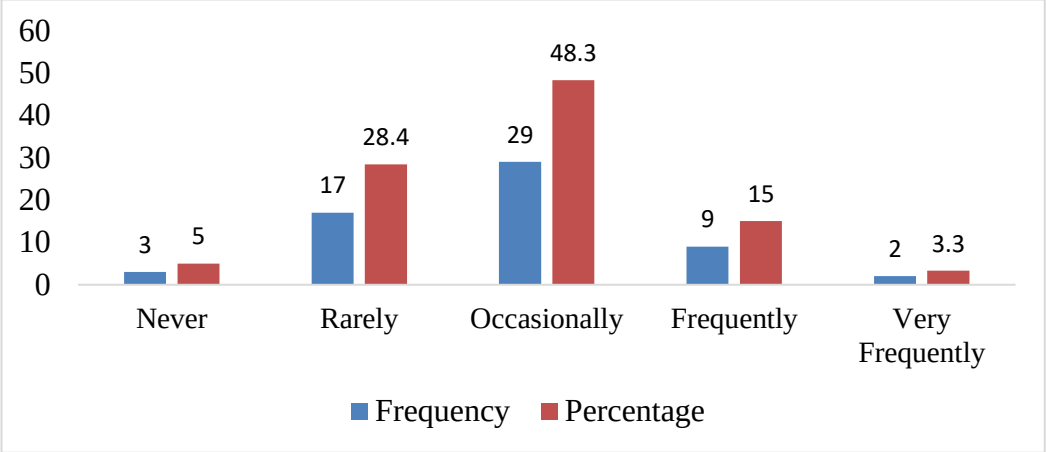
> *I don't know what type of RMS is used, what I want is well-arranged citation references* (Interview with lecturer E; 2022).

These statements indicate that even lecturers were not aware of RMS.

The majority 38(63.3%) of postgraduate students use Mendeley software to organise their scholarly works. The results are supported by the study of Nitsos *et al.*, (2021) which found that more than two-thirds of postgraduate students use Mendeley, followed by Endnote. Nitsos *et al*. (2021) study also found that the majority (almost two-thirds) of the respondents identified themselves as non-users of reference management software. Furthermore, Kent (2011) and Speare (2018) noted that there are reasons that influence students not to use RMS. These include the fact that they don't have time to learn a program, search for the right software, lack of training, and lack of confidence in using RMS. In general, the type of RMS used by postgraduate students is determined by their willingness or their supervisor's recommendations.

4.4.2 Frequency of Usage of RMS

Respondents were asked to state the frequency of RMS usage in their scholarly work. This question was directed to respondents who indicated that they use RMS software. The respondents were required to choose one of the provided variables, which were: very frequently, frequently, occasionally, rarely, and never. The findings are summarized in Figure 4.1:



Source: Field Data (2021)

The findings from Figure 4.1 revealed that 29 (48.3%) used RMS occasionally, 17 (28.4%) rarely, 9 (15%) frequently, 2 (3.3%) very frequently and 3 (5%) never used RMS. The results show that the majority of postgraduate students use RMS occasionally. This implies that postgraduate students don't use RMS as much as per expectations. The results concur with the study by Nitsos *et al.* (2021), who noted that very few students use RMS even after being introduced. Also, the UTAUT theory views that people are reluctant to use technologies because of technophobia and a lack of skills and knowledge to apply in their academic work (Attuquayefio & Addo 2014). However, the results also indicate that very few postgraduate students 3 (5%) do not use RMS. Similarly, the study by Speare, (2018) claims that some students do not use RMS due to the changes over the year and also because it is difficult to use. In this study context, it seems some postgraduate students apply RMS occasionally, while others do not apply at all, regardless of the knowledge and skills they acquired in the orientation courses.

4.4.3 The Usage of Reference Management Software Features

Reference management software tools offer many information management features that can help postgraduate students manage their academic writing. The researcher aspired to understand which features were frequently used by postgraduate students.

Table 4. 5: Usage of Reference Management Software Features(s) (Multiple Responses)

	Description	Frequency	Per cent
1	Manage reference	57	95
2	Discover new reference	21	35
3	Format citations with multiple styles	37	61
4	Saving citation	46	76.6
5	Creation of bibliographic entries	1	1.6
6	Sharing references with others	3	5

Source: Field Data (2021)

According to Table 4.5, 57 (95%) of postgraduate students used RMS to manage references, 46 (76.6%) used it for saving citations, 37 (61%) indicated they used it for formatting citations, and 21 (35%) stated that they used it to discover new references, 3 (5%) used it to share references with others, and 1 (1.6%) used automation for the creation of bibliographic entries. The majority of postgraduate students, 57 (95%), used RMS to manage references. The results show that postgraduate students used RMS to manage references, contrary to the fact that RMS contains numerous functions that are underutilized. The study by Gilmour and Cobus-Kuo (2011) stated that RMS is expected to import citations from bibliographic databases and websites, gather metadata from PDF files, allow organization of citations within the RM database and allow annotation of citations,

allow sharing of the RM database or portions with colleagues, allow data interchange with other RM products through standard metadata formats (e.g., RIS, BibTeX), produce formatted citations in a variety of styles and work with word processing software to facilitate in-text citation. Also, Wahyuningsih (2020) emphasized that RMS features assist students in improving the quality of their academic work.

It seems postgraduate students lack the individual behavioural intention to learn other features of RMS that are important for qualified work. Subsequently, according to Sarrafzadeh and Hazeri (2014), results show a general awareness of RMS among respondents, but a low rate of RMS usage.

4.4.4 Reasons for Using Reference Management Software

RMS is a tool that offers a lot of functions in academic writing. The researcher wanted to find out the reasons which attract respondents to use RMS.

Table 4.6: The Prompts for Choice of Reference Management Software Currently Used. (Multiple Responses)

S/N	Reasons	Frequency	Per cent	Mean	Std. Deviation
1	Free	55	91.6	4.73	.446
2	Easy to use	53	88.3	4.23	.621
3	Best performing RMS	47	78.3	3.48	.930
4	Provided by institution	2	3.3	1.62	1.342
5	Suggested by colleagues	5	8.3	3.77	.8191.
6	Enough storage space	16	26.6	1.73	1.219
7	Advice by supervisor	35	58.3	4.00	1.089

Source: Field Data (2021)

Table 4.8 indicates that 55 (91.6%) of postgraduate students claimed that they used free RMS of their choice, 53 (88.3%) said it was easy to use, 47 (78.3%) said it was the best performing RMS, 35 (58.3%) indicated advice from the supervisor, 16 (26.6%) said they used RMS with enough storage space, 5 (8.3%) noted that it was suggested by colleagues, and 2 (3.3%) indicated that it was provided by the institution.

The findings revealed that the majority of postgraduate students, 55 (91.6%), used free RMS, followed by easy-to-use. This might be influenced by the Foundation Course offered to the postgraduate students, in which lecturers teach them to use free RMS such as Mendeley already installed in the computers around conventional and e-libraries at KCMUCo. The findings are supported by the study of Amrutha, Kumar and Kabir (2018), Speare (2018), Sarrafzadeh and Khaleghi (2017), which said that the main reason postgraduate students select the software is because it is easy to use, followed by free of charge. UTAUT theory concedes that for the students to adopt the new technology, it should be perceived as easy to use (Tan, 2013).

4.4.5 Ways through which Postgraduate Students get Assistance in using RMS

Reference Management Software is a scientific resource that needs instruction on how to use it. The researcher posed this question to know where postgraduate students get support for using RMS. A 4-point Likert scale was used to measure the level of awareness of RMS features whereas (1) = Most of the time, 2= some of the time, 3= seldom, and 4=never.

Table 4. 7: The Areas Respondents Get Assistance in Using Reference Management Software

	Most of the time	Seldom	Sometimes	Never	Mean	SD
Seminars/Workshops	36(60%)	10(16.7%)	10(6.7%)	4 (6.7%)	3.30	.979
Lecturers	36(60%)	7(11.7%)	12(20%)	5(8.3%)	3.32	.983
Librarians	1(1.7%)	9(15%)	5(8.5%)	45(75%)	1.37	.712
Colleagues	38(55%)	2(3.3%)	21(35%)	4(6.7%)	3.38	.846
Webpages	45(75%)	3(5%)	8(13%)	4(6.7%)	3.57	.871

Source: Field Data (2021)

Table 4.7 shows that postgraduate students get assistance in using RMS through seminars or workshop as follow: 36 (60%) most of the time, 10 (16.7%) seldom, 10 (6.7%) sometimes, and 4 (6.7%) never. Through lecturers; 36 (60%) use most of the time, 7 (11.7%) seldom, 12 (20%) sometimes and 5 (8.3%) never; through librarians; 1 (1.7%) most of the time, 9(15%) seldom, 5 (8.5%) sometimes; and 45 (75%) never. Colleagues; 38 (55%), use most of the time, 2 (3.3%) seldom, 21 (35%) sometimes, and 4 (6.7%) never, webpages; 45 (75%) most of the time, 3 (5%) seldom, 8 (13%) sometimes, and 4 (6.7%) never.

The majority of postgraduate students get assistance in using RMS most of the time through Web pages 45 (73%), colleagues 38 (55%), followed by seminars or workshops and lectures 36 (60%), while on the other hand, the least amount of assistance they got was from librarians. The results support the study done by Speare (2018), which concluded that postgraduate students were interested in self-help

training options like online tutorials and webpages and were not as interested in assistance in the library.

Also, the researcher conducted an interview with lecturers to get more information about where the students seek assistance when using RMS.

One of the respondents had this to say:

> *During the postgraduate foundation course, we instruct students on how to use research tools to include RMS, but it is not sufficient to utilize RMS effectively so students still need to attain additional knowledge on usage of RMS through training or workshops. (*Interview with lecture F, 2022)

The researcher further interviewed a Librarian to know if they assist postgraduate students with the usage of RMS. The Librarian's response is as follows;

> *The majority of postgraduate students seek assistance from librarians on how to use RMS. Unfortunately; we librarians have little understanding of RMS usage, so it is difficult to assist them. (*Interview with Librarian A, 2022*)*

The findings show that postgraduate students don't get enough assistance from their lecturers and librarians on how to use RMS. McMinn (2011) revealed the importance of librarians in the training and uptake of the RMS. emphasized that, apart from providing similar services; the library should determine how services have been tailored to meet the unique needs. Okodero, (2021) added that the adoption of RMS can only be successful if library staff prioritize training its use and support the students to acquire the necessary skills to navigate RMS.

In general, a postgraduate foundation course is not sufficient to impact knowledge of the use of RMS on postgraduate students; what is needed is to impart knowledge to librarians and lecturers to assist students in the effective use of RMS.

4.5 Challenges of Using Reference Management Software

There are challenges in the course of using Reference Management Software (RMS) as a technological-based system. Users of RMS might experience some difficulties when using it. This part wished to know the problems that hinder the effective use of RMS. A 5-point Likert scale was used to measure the set of challenges likely faced by postgraduate students in the use of RMS features whereas 1= SA - Strongly agree, 2=A – Agree, 3=N–Neutral, 4 D-Disagree, 5=SD - strongly disagree. The results are demonstrated in Table 4.8.

Table 4. 8: Challenges of using Reference Management Software (Multiple Responses)

Challenges	SA	A	N	D	SD	Mean	S. D
Lack of skills and knowledge	34(56.6 %)	24(40%)	1(1.7%)	1(1.7%)	-	4.52	.624
Keep updated with changes	25(41.7 %)	29(48.3%)	2(3.3%)	4(6.7%)	-	4.18	1.017
Very expensive	1(1.7%)	4(6.7%)	10(16.7%)	22(36.7%)	23(38.3 %)	1.97	.991
Lack of assistance	15(25%)	37 (61.7%)	5(8.3%)	2(3.3%)	1(1.7%)	4.05	.790
Difficult to install	18(30%)	12(20%)	25(41.7%)	3(5%)	2(3.3%)	3.68	1.066
Not provided by the college	4 (6.7%)	11 (18.3%)	21 (35%)	9(15%)	15 (25%)	2.67	1.230
Interface is not user-friend	12(20%)	12(20%)	25(41%)	6(10%)	5(8.3%)	3.33	1.160

Source: Field Data (2021)

4.5.1 Lack of skills and knowledge

Findings in Table 4:8 revealed that 34 (56.6%) respondents strongly agreed on the lack of skills and knowledge hindering the usage of RMS, 24 (40%) agreed, 1 (1.7%} disagreed, and 1 (1.7%) strongly disagreed. The findings are also similar to the interview in which one of the lecturers said that:

> *Most postgraduate students lack adequate skills and knowledge in using RMS. We encourage them to put more effort into adopting software due to its advantages. (*Interview with Lecturer G, 2022*)*

Also, Librarian B said:

> *It is true that librarian is the one responsible for imparting knowledge and skills to postgraduate students on how to use RMS unfortunately even though we don't have those skills and knowledge. (*Interview with Librarian B, 2022)

This was strongly supported by Okodero's (2021) study which emphasized that competence level in various aspects is key to the adoption and use of RMS by postgraduate students.

4.5.2 Keep Update with Changes

The findings from Table 4.8 revealed that 25 (41.7%) of respondents strongly agreed that keeping updated with changes was the reason that hinder the effective use of RMS, 29 (48.3%) agreed, 2 (3.3%) were neutral, and 4 (6.7%) disagreed**.**

The results show that most postgraduate students fail to keep updated with changes because more than half agreed they failed to update with changes. Furthermore, the findings are consistent with Randall *et al.* (2008), who said that keeping up-to-date with changes to the software is one of the barriers to postgraduate students' usage of RMS.

In general, there is the constant dynamic change of technology including RMS hence making it very challenging for postgraduate students to move with these changes.

4.5.3 Very Expensive

The findings revealed that 23 (38.3%) of postgraduate students strongly disagreed that RMS is not expensive, 22 (31.7%) disagreed, 10 (16.7%) were neutral, 4 (6.7%)

agreed and 1 (1.7%) strongly agreed. The majority of respondents responded that RMS is not expensive. This is due to some RMSs being free of charge, such as Mendeley & Zotero, while others, including Ref Works, are for commercial purposes. The findings are similar to those of Speare (2018) who states that postgraduate students have many RMS options available to them, many of which are free, paid for by an institutional license, or available at a low cost.

4.5.4 Lack of Assistance

The findings from Table 4.8 revealed that 15 (25.1%) strongly agreed, 31 (61.7%) agreed, 5 (8.3%) were neutral, 2 (3.3%) disagreed, and 1 (1.7%) strongly agreed. Lack of assistance is a problem with using RMS. The majority of postgraduate students 31 (61.7%), agreed that lack of assistance from librarians and lecturers is a major problem in using RMS. This might be caused by a lack of knowledge and skills of the librarians and lecturers in using RMS. The findings concur with Childress, (2011) who concedes that a lack of knowledge and confidence hinders librarians from assisting postgraduate students in using RMS. Also, the study by Francese (2010), confirms that the lack of required skills among academic librarians might be the main obstacle to providing RMS training. Though the findings contrast with Madhuri & Harilakshmi (2021), in their study, 61% of respondents agreed that their libraries are providing RMS tool support. Similarly, UTAUT theory views students as failing to use RMS because they lack socially influential people around them to use technologies such as RMS. Therefore, there should be social support for the students to adopt technologies in their academic endeavours (Bozan *et al., (2015)*.

4.5.5 The Interface is not user-friendly

Findings in Table 4:8 revealed that 12 (20%) strongly agreed that the interface is not user-friendly to them when using RMS, 12 (20%) agreed, 25 (41%) neutral, 6 (10%) disagreed, and 5 (8.3%) strongly disagreed. The majority of respondents, 25 (41%), were neutral and 24 (40%) agreed that the interface is not user-friendly. The findings are similar to those of Randall et al. (2008), who said that one of the barriers to postgraduate students using RMS is that the interfaces are not user-friendly and advised the importance of an easy-to-use interface.

In general, postgraduate students indicate that a lack of skills and knowledge is a challenge that hinders them from using RMS in their academic writing.

4.6 Improvement towards the Use of Reference Management Software

This section aimed at understanding the general recommendations to improve the use of RMS. The respondents were invited to provide their recommendations to improve the use of RMS among postgraduate students.

The study findings indicate that the majority of postgraduate students, 35 (58%) held the view that RMS is an important tool for academic writing, thus, students need effective training on how to select, install, and use RMS. This finding is supported by Wahyuningsh, (2020), who comments that RMS has played a crucial role in assisting students in organizing them in-text citations and references for their academic writing. Mhokole & and Kimario (2022) agreed that postgraduate students should receive regular training on how to use RMS based on their needs.

Subsequently, the findings from the librarian interview sessions recommended that librarians should be equipped with knowledge and skills on the use of research tools including RMS, plagiarism software, and search strategies to support library users. The findings concur with the study by Sarrafzadeh & and Khaleghi (2017) which supports that librarians should be equipped with the necessary skills and knowledge on how to use various reference management software for their continuing professional development.

Furthermore, the data collected from the lecturers through interview sessions provided the following recommendations on how to improve the use of RMS as follows:

Lecturer H said:

> *The use of research tools should be taught effectively from the undergraduate level as a strong foundation to build upon in their postgraduate studies.* (Interview with Lecturer H, 2022)

This concurs with the study by Lamptey and Atta-Obeng (2018), who recommended that students should be taught how to use research tools by faculty and librarians in their first and final year of studies. They emphasized that giving the students practice at their early stages of studies would be of wider benefit.

Another lecturer had this to say about how to improve the use of RMS

> *Librarians should make efforts to market the use of RMS by using different methods including the preparation of instructional manuals such as guidelines and videos to help postgraduate students to be familiar with RMS.* (Interview with Lecturer I, 2022)

Likewise, lecturer J emphasized:

> *Learning how to use RMS is time-consuming and, postgraduate students require a commitment to learn and practice how to use RMS and its features.* (Interview with Lecturer J, 2022)

Therefore, training and commitment on how to use RMS are vital factors that should be imparted to not only the postgraduate students but also the librarians and lecturers.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Summary of the key findings

The goal of this study was to assess the use of RMS by postgraduate students at Kilimanjaro Christian Medical University College. The study employed mixed methods to collect qualitative and quantitative data. The study involved 91 respondents, of whom 69 (75.8%) were postgraduate students, 14 (15.4%) were lecturers and 8 (8.8%) were librarians. The study was based on three objectives, including identifying the levels of awareness of postgraduate students about the use of RMS at KCMUCo, examining the use of RMS by postgraduate students, and identifying the problems facing postgraduate students in using RMS at KCMUCo. The key findings are presented according to the research objectives as follows;

5.2. Level of Awareness of the Postgraduate Students on RMS

According to the findings of this study, 60 (100%) of postgraduate students were aware of RMS. However, the level of awareness varied from one respondent to another. Furthermore, the study found that the majority of postgraduate students 56, (93.3%), acquired awareness of the use of RMS through their lecturers.

5.3 Usage of RMS by Postgraduate Students

The study findings revealed that Mendeley software with 38 (63.3%) was the most popular and widely utilized by postgraduate students among RMS, followed by Endnote with 26 (43%). This is because, in comparison, Mendeley software is free

and simple to use, with many capabilities such as managing references, sharing references with others, storing full PDFs, and discovering new references. However, the findings indicate that postgraduate students did not utilize all the Mendeley software features as they lacked awareness of such features.

5.4 Ways through which Postgraduate students get Assistance in using RMS

The study results show that the majority (75%) of postgraduate students obtained assistance in using RMS through Webpages and the least (1.7%) obtained assistance from librarians.

5.5 Challenges Facing Postgraduate Students in Using RMS

The findings observed several obstacles to the effective use of RMS by postgraduate students, including a lack of skills, information, and assistance from librarians and lecturers. Also, it was discovered that postgraduate students were not keeping themselves up to date with RMS.

5.6 Conclusion

The findings concluded that, while the majority of the respondents were aware of RMS, the use of RMS was relatively low due to various reasons, like lack of necessary knowledge, skills and information on the use of RMS. Furthermore, Mendeley software was the most popular software used by postgraduate students. However, some Mendeley features were underutilized. This means there are no sufficient initiatives in place to create awareness and usage of RMS. Therefore, there

is a need to establish some initiatives to promote the use of RMS by postgraduate students in their scholarly works.

5.7 Recommendations

To improve the usage of RMS to the postgraduate students, this study recommends the following:

i. To enhance awareness among postgraduate students, the university should provide comprehensive training, workshops, and seminars together with online instructional materials such as videos, webinars, and tutorials at institutional or departmental levels;
ii. Librarians should be equipped with the knowledge and skills to use research tools to assist postgraduate students;
iii. KCMUCo, through its Directorate of Research and Consultancies, should ensure optimal use of RMS through comprehensive training on relevant research tools;
iv. The university management should undertake a needs assessment to identify an RMS that is user-friendly, affordable, and can perform various functions to streamline academic work and;
v. To fully address the needs of postgraduate students regarding the use of RMS, the university management should increase the number of qualified librarians and ICT personnel.

5.8 Areas for Further Studies

i. This study assessed the use of RMS by postgraduate students at Kilimanjaro Christian Medical University College. Further studies are recommended to be conducted on the same topic by assessing the impact of Reference Management Software utilization on research productivity among postgraduate students.

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APPENDICES

APPENDEX 1: QUESTIONNAIRE FOR POSTGRADUATE STUDENTS

I am **Janeth Machange**, a student at Open university of Tanzania pursuing Master's degree in Library and information Management undertaking research on: the Usage of Reference Management Software: A Case of Postgraduate Students at Kilimanjaro Christian Medical University College. I kindly request you to contribute towards attaining the goal of this study by opening and giving your experiences, views ideas and opinions on this topic. The information you provide will be treated with highly confidentiality and will be used for academic purposes only.

SECTION A: Demographic Information Please tick

1. What is your gender? (√)

○ Female

○ Male

2. Please tick (√) your age group

21 – 30 ☐

31 -40 ☐

41 and above ☐

Your programme of study masters / PhD) .....

B: AWARENESS OF REFERENCE MANAGEMENT SOFTWARE

4. Do you know about Reference Management Software (RMS) (*word processing software that organizes references and in-text referencing?*

YES ◯ NO ◯

5.To what level would you rate your awareness of RMS? Please tick (√)

Not at all aware	Slightly	Somewhat aware	Moderately aware	Extremely aware

6.Which Reference Management Software are you aware of? Please tick (√)

S/n	Categories of responses	Response
I	Mendeley	
It	Zotero	
Iii	Endnote	
Iv	Refworks	
V	ReadCubes papers	
Vi	Refbase	

7. What are the ways you became aware of Reference Management Software

S/n	Categories of responses	Response
I	Colleagues	
ii	Librarian	
Iii	Self-study	
Iv	Lectures	
V	Workshop /seminars	
Vi	Others	

SCETION C: USAGE OF REFERENCE MANAGEMENT SOFTWARE

8. Which type of Reference Management software you most use in your academic works. Please tick (√) you can select more than one response.

s/n	Categories of responses	
1	Mendeley	
2	Zotero	
3	Endnote	
4	Refworks	
5	ReadCubes papers	
6	Refbase	

8 (b) If non above, how do you organize your reference and your citations

9.Rank how often you use the Reference Management Software. Please tick (√)

Very frequently	Frequently	Occasionally	Rarely	Never

10. Which Reference Management Software feature(s) you mostly use.

s/n	Categories of responses	Response
1.	Managing references	
2	Discover new references	
3	Format citation with multiple style	
4.	Saving citations	
5.	Automation creation of bibliographic entries	
6.	Sharing reference with others	

11. What prompts (makes) you to use the Reference management software you are currently using? Please tick (√) you can select more than one response.

s/n	**Categories of responses**	**Response**
1.	Free of cost	
2	Easily to use	
3	Best performing RMS	
4	Provided by institution	
5	Suggested by colleagues	
6	Enough storage space	
7	Advised by supervisor	
8	Others	

12. Please rank where are you getting assistance in using Reference Management Software?

s/n	Categories of response	Most of the time	Some of the time	seldom	Never
i.	Seminars/workshop				
Ii	Lectures				
iii.	Librarians				
iv.	Colleagues				
V	Webpages				
Vi	Lecturers				

SECTION D: CHALLENGES OF USING REFERENCE MANAGEMENT SOFTWARE

13. What do you think are the challenges of using Reference Management Software? Please tick (√) you can select more than one response.

s/n	Categories of responses	Strong agree	Agree	Neutral	Slightly disagree	Disagree
i.	Lack of skills and knowledge					
Ii	Keep update with changes					
Iii	Very expensive					
iv	Lack of assistance					
V	Lack of confidence					
Vi	Lack of awareness					
Vii	Difficult to install					
Viii	Not provided by college					
Ix	Interface is not user-friendly					
X	Not provided by supervisor					

14. What do you think can be done to improve the usage of reference management software?

A. For the postgraduate students

B. For the College Management

C. For the library staff

Thank you for your co-operation

APPENDIX II: INTERVIEW GUIDE FOR LIBRARIAN

1. What is your level of education?
2. How long have you been working in library?
3. What do you know about Reference Management Software?
4. Do students use reference management in managing their reference and citations?
5. Which do your think are the types of Reference Management software mostly used by students?
6. Do you conduct any training to students on the usage of reference management software?
7. Are there any RMS installed to assist students to manage their references and citations?

   i) If yes which software?

   ii) If no what effort library made to install or purchase Reference Management Software?
8. Are there any challenges students experience in using RMS?

   What can be done to improve the use of Reference management software?

Thank you for your cooperation

APPENDIX III: INTERVIEW GUIDE FOR LECTURERS

1. What is your level of education?
2. How long have you been working in this College?
3. What do you know about Reference Management Software?
4. Do you require your students to use reference management in managing their references and citations?
5. Which are the types of Reference Management software mostly used by students.
6. How do you ensure students use RMS in organizing Reference and citation?
7. Is the College installed or purchased any Reference Management Software to assist students in managing their references and citations?

   i) If yes which software?

   ii) If no what effort the college made to install or purchase Reference Management Software?
8. Do you train or assist students on how to use RMS for organizing references?
9. Do you experience any challenges reported by students about the usage of Reference Management Software?
10. What can be done to improve the use of Reference management software?

Thank you for your cooperation

THE OPEN UNIVERSITY OF TANZANIA

DIRECTORATE OF POSTGRADUATE STUDIES

P.O. Box 23409
Dar es Salaam, Tanzania
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ext.2101
Fax: 255-22-2668759
E-mail: dpgs@out.ac.tz

Our Ref: PG201702194

25th November 2021

Regional Administrative Secretary,
Kilimanjaro Region,
P.O Box 3070,
KILIMANJARO.

RE: RESEARCH CLEARANCE

The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1st March 1993 by public notice No.55 in the official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1st January 2007.In line with the Charter, the Open University of Tanzania mission is to generate and apply knowledge through research.

To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you **Ms. MACHANGE Janeth Onesmo, Reg No: PG201702194** pursuing **Master of Library and Information Management (MLIM).** We here by grant this clearance to conduct a research titled **"The Usage of Reference Management Software A Case of Postgraduate Students at Kilimanjaro Christian Medical University College".** She will collect her data at Kilimanjaro Medical University College from 29th November 2021 to 10th January 2022.

In case you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O.Box 23409, Dar es Salaam.Tel: 022-2-2668820.We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours,
THE OPEN UNIVERSITY OF TANZANIA

Prof. Magreth S.Bushesha
For: VICE CHANCELLOR

THE UNITED REPUBLIC OF TANZANIA
PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

KILIMANJARO REGION
Telegrams 'REGCOM'
KILIMANJARO
Tel. No. 027-2754230/7, 2752184
Fax No.027 – 27-54430
E-mail ras.kilimanjaro.go.tz
Ras.kilimanjaro@tamisemi.go.tz

OFFICE OF THE REGIONAL COMMISSIONER,
P. O. BOX 3070,
MOSHI

In reply please quote:

Ref. No. FA.228/276/03"Q"/277

03th Desemba, 2021

District Executive Director,
MOSHI.

Re: **RESEARCH PERMIT**

Refer to the above subject.

2. I would like to Introduce to you **Machange Janeth Onesmo** who is a Bonafede Researcher from **Open University of Tanzania.**

3. He expects to conduct research on History Repeat itself: ***"The Usage of Reference Management Software ".*** *A case study in* ***Kilimanjaro Christian Medical Univesity College*** *in Kilimanjaro Region.*

4. The permission has been granted for her to collect data from **29 November, *2021 to 10 January, 2022.***

5. Please give him the required Co – Operation and make sure that he abides by all Government regulations and directives.

Thank you for your cooperation.

Hillary Mapingulila
For: Regional Administrative Secretary,
KILIMANJARO

For, Regional Administrative Secretary
KILIMANJARO

Copy to: Regional Administrative Secretary,
KILIMANJARO - (*To see in the file*)

,, Machange Janeth Onesmo
RESEARCHER.

KILIMANJARO CHRISTIAN MEDICAL UNIVERSITY COLLEGE

(A Constituent College of Tumaini University Makumira)

Internal Memo

6th December, 2021

Ms. Janeth Onesmo Machange,

RE: Permission approved to conduct study

Reference is made to your letter dated 3rd December, 2021 requesting for permission to conduct research at Kilimanjaro Christian Medical University College on your project titled, **"The Usage of Reference Management Software"**

Kindly be informed that permission has been granted to conduct research at Kilimanjaro Christian Medical University College

Thank you for your cooperation.

Sincerely yours,

Beatrice Temba.
SAHRO-DRC