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Usage of Reference Management Software by Postgraduate Students at the University of Dar es Salaam, Tanzania

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Abstract

This paper presents the of a study conducted at the University of Dar es Salaam (UDSM), Tanzania on the usage of Reference Management Software (RMS) by postgraduate students and guided by TAM and DIT theories. The study employed a descriptive research design and collected both quantitative and qualitative data. It also used stratified and simple random sampling techniques to draw samples. One hundred and four (*104) respondents participated in this study. The study used questionnaire and documentary review methods to collect data. Key findings revealed that a majority of the respondents are aware of RMS. The most commonly known RMS is Mendeley. Findings further revealed that most respondents have a favourable attitude toward RMS and perceive RMS as useful and easy to use, even though few actually use RMS mainly to write research proposals and theses/dissertations. The study also revealed that postgraduate students encounter challenges in using RMS including inadequate requisite skills, lack of technical services support, lack of internet connectivity and unreliable power supply. The study concluded that the usage of RMS by postgraduate students at UDSM is low.*

Keywords: Citation; references; reference management software; postgraduate students; University of Dar es Salaam; Tanzania.
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Introduction

Postgraduate students use a lot of information resources in both electronic and print formats to write their academic works. Citations and references are very crucial components in any scientific writing. According to Lonergan (2017), Reference Management Software (RMS) is a very important tool to postgraduate students for organizing citations and references in their academic and research works. Experiences at

University of Dar es Salaam Library Journal
Vol 17, No 2 (2022), pp 188-203
ISSN: 0856-1818

the global and regional levels show that some universities have taken initiatives to formally integrate and support application of RMS in their institutions, for instance University of York (United Kingdom), Helsinki University (Finland) and Monash University (South Africa) (Melles & Unsworth, 2015). On the contrary, the University of Dar es Salaam (UDSM) has not formally integrated and supported the use of RMS. In the absence of formal support of RMS at UDSM, its use by postgraduate students was expected to operate within a normal diffusion/ adoption context. Such process of use is strongly underpinned by individual postgraduate student's awareness and attitude towards RMS. It was against this background that the key research interest was to understand how postgraduate students use RMS in their academic works within the normal diffusion/ adoption context.

In view of the significant role of RMS in tracking and managing references, however evidence show that postgraduate students' do not consistently use RMS in managing references, for instance Monash University in South Africa (Melles & Unsworth, 2015) and Tallinn University in Estonia (Francese, 2012b). Such irregular use behaviour may have negative consequences in the quality of postgraduate students academic and research works in respect of citation and references. The different citation and referencing styles of information resources available in print and electronic formats, pose impending difficulties for postgraduate students to remember and capture all patterns of the bibliographical information when using manual system, as a result, inconsistency, incompleteness and inaccuracy may occur in citing and referencing (Parabhoi et al., 2017). Along the same line, improper citation is simply bad scholarship and plagiarism, which can be avoided through proper citation by using RMS (Mbilinyi & Msuya, 2018). Therefore, the study focused on awareness, attitudes and usage of RMS among postgraduate students' and the challenges they encounter.

Related Literature

Level of awareness is a decisive factor and motivator for one to use innovative technology such as Reference Management Software (RMS). Awareness is about having knowledge of a particular thing (Gafoor, 2012). Reviewed empirical literature shows that most postgraduate students are aware of RMS. For instance, the survey conducted at Tallinn University on RMS revealed that a majority of postgraduate student are aware of RMS compared to those who are not familiar (Lonergan, 2017). Regarding the most known RMS by postgraduate students, a study by Francese (2012a) at the University of Torino indicated that EndNote was known by 79% of the respondents, followed by Reference Manager (32%), BibTex (28%), Zotero (19%) and Mendeley (18%). A critical look at results from previous studies is that familiarity of a particular RMS by postgraduate student is dependent on the communication channels used to make it known. Hence, methods of knowing RMS were incorporated and measured in this study as indicator of how RMS is communicated in the academic context. This was important partly because the UDSM has yet to formally introduce RMS to its community. This is also partly because efforts to influence attitudes and ultimately optimize usage of RMS should take into consideration how individuals are exposed to a particular product of interest.

University of Dar es Salaam Library Journal
Vol 17, No 2 (2022), pp 188-203
ISSN: 0856-1818

Further empirical literature revealed that attitude is an important factor influencing postgraduate students to either use or reject RMS. According to Alkahtani (2016), attitude is defined as a persons' preference in using or rejecting RMS based on their perceived usefulness and perceived ease of use. Empirical evidence by Sarrafzadeh and Hazeri (2014) showed that most respondents (98%) perceived RMS as easy to use. Another study by Childress (2011) revealed that most respondents perceived RMS to be useful in the sense that it saves time of the researcher from the dull tasks of searching and storing information in the process of citing and referencing their research reports. The underlying assumption here was that perceived usefulness and ease of use are key indicators of attitude, which also have a bearing on individual use intension and actual use behaviour.

Regarding extent of RMS use, previous studies have shown that there are diverse levels of use across academic institutions ranging from low to high-level usage. According to Francese (2012b), scholars including postgraduate students have been using RMS to support their academic research works in citation and referencing. Furthermore, a study by Madhusudhan (2016) at University of Delhi revealed that (78%) of the respondents used RMS for research works including thesis/dissertation and project works, followed by those who used for literature review (40%), while (32%) use them to complete seminar presentations/ assignments and (17%) for articles.

Regarding variation of RMS use across professions, for instance Melles and Unsworth (2015) study reported very low level of RMS use by PhD biology students at the University of Parma. A study by Ram and Anbu (2014) also reported low RMS usage (45%) among Information Science professionals and postgraduate students. A study by Parabhoi, Sahu, and Bhoi (2018) revealed that a majority of LIS professionals (59.37%) at India use RMS. Literature has also revealed variations in extent of RMS use by age category. For instance, a study by Francese (2012a) showed that more respondents (42%) in the 55 and above years used RMS as compared to young respondents (9%) in the 26-35 age group that indicated to use RMS. In view of most used RMS features, a study by Sarrafzadeh and Hazeri (2014) showed that tagging citations for easy retrieval is the widely used feature by faculties. Other reported features are importing data from other databases and Google Scholar, inserting in-text citations, sharing data with colleagues, saving documents in PDF, and extracting bibliographic information from PDF.

Empirical studies have also identified challenges that postgraduate students face in using RMS in academic institutions. Challenge was conceived as an obstacle that resists in performing some works smoothly and effectively. Among the problems facing postgraduate students in using RMS, include technophobia, unreliable power supply, poor ICT infrastructure, financial scarcity, lack of technical support and lack of skills (Parabhoi et al., 2017). These challenges tend to interfere with the smooth application of RMS such that user may not reap their benefit potentials.

Furthermore, various studies have proposed solutions to overcome challenges constraining the use of RMS by postgraduate students. For instance, Melles and Unsworth (2015) were of the view that technical capabilities in the use of RMS are very important to academic librarians given the limited support rendered to scholars and

University of Dar es Salaam Library Journal
Vol 17, No 2 (2022), pp 188-203
ISSN: 0856-1818

postgraduate students who face technical problems in using RMS. In addition, another study by Roux and Breshears (2017) recommended internet connectivity with high speed to facilitate installation of RMS and its eventual use. On the question of unreliable power supply, Eligi and Mwantimwa (2017) proposed installation of automatic switch on standby generators and solar power systems as solution to power supply problems.

Technology Acceptance Model (TAM) by Davis (1989) and Diffusion of Innovation Theory (DIT) by Rogers (2003) guided the study. The TAM model's key assumption is that use of any technology largely depends on user's attitude, which is determined by perceived usefulness and perceived ease of use of a technology. That is to say the intention to use a technology depends on whether user perceives the technology will improve performance and if the user will expend less effort in using the technology. However, the TAM model is not comprehensive because it ignores other variables that influence user behaviour such as level of awareness. The DIT was used to complement the weaknesses of TAM by including level of awareness as an important variable that influences use of RMS.

The DIT focuses on an individual's decision process to adopt or reject a new innovation. The process is governed by factors such as innovation, communication channels, time and social system. Meaning that for an innovation to be adopted it must be communicated to individuals in a particular social system through certain channels at a particular period of time. Innovation is a new procedure, method, tool or technology. The innovation-decision process involves five stages, which are knowledge, persuasion, decision, implementation and confirmation. However, the DIT has its share of weaknesses such as over emphasis on adoption and blames an individual for not adopting. Despite its shortcomings, the TAM and DIT provided strong theoretical bases in explaining and understanding key variables for the study. Hence, based on the two theories and reviewed literature; a conceptual framework was developed and guided this study. Key variables from TAM include attitude and use, but awareness was borrowed from DIT and the challenges were drawn from reviewed literature as shown in Figure 1.

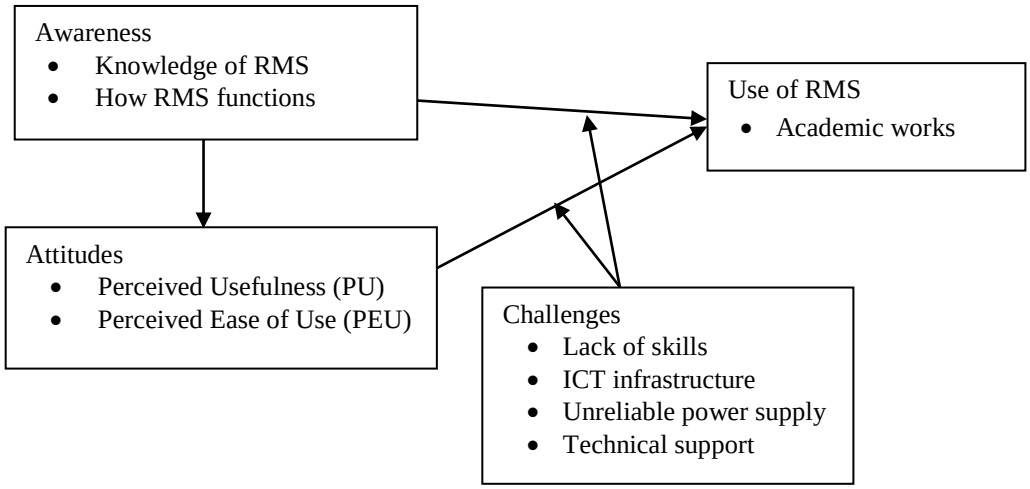

Figure 1: Conceptual Framework on Usage of RMS

University of Dar es Salaam Library Journal
Vol 17, No 2 (2022), pp 188-203
ISSN: 0856-1818

The conceptual framework shows independent variables namely awareness and attitudes. It also shows dependent variable as use of RMS and the intervening variables as challenges. The assumption is that postgraduate students' use of RMS is influenced by one's level of awareness and attitudes towards RMS. As shown in the conceptual framework, postgraduate students' attitudes towards RMS are also influenced by one's level of awareness of RMS. It also shows that use of RMS can be expressed in different academic works for which RMS are applied. The indicators of awareness are knowledge of RMS and how it works. The underlying assumption is that a postgraduate student can effectively use RMS if he/she has knowledge of a particular RMS and how it works. Further, sub indicators of knowledge of RMS are the types known and ways of becoming aware i.e. communication channels. The assumption is that innovation spreads through communication channels within a certain social context. In this study, communication channels are ways or methods of knowing RMS such as training, orientations, colleagues and websites, which postgraduate students can reach within the university context. The indicators of attitude are perceived usefulness and perceived ease of use. In the context of this study, the attitudes of postgraduate students towards RMS use are indicated by their perceptions of whether RMS can improve their work performance and will require less effort in using it. Regarding academic works as an indicator of RMS use, the assumption is that postgraduate students do not equally apply RMS for tracking and referencing in all their academic works. As shown in the conceptual framework, the relationship between awareness and attitude as independent variables and use of RMS as dependent variable is not neutral; it is rather moderated by challenges. In this study, challenges of using RMS include inadequate skills which affect actual use of RMS. ICT infrastructure like internet connectivity equally affects the actual use of RMS. Meaning, if there is no internet connectivity postgraduate students cannot install RMS and use web importer to add sources and materials online. Unreliable power supply and lack of technical support can also affect use of RMS.

Methodology

The study used descriptive research design and the mixed methods approach in data collection. The study was conducted at Mwalimu Julius Kambarage Nyerere (MJKN), Mlimani campus of the University of Dar es Salaam (UDSM), which is located in Ubungo district in Dar es Salaam region. The UDSM was selected because it is the largest university in Tanzania in terms of postgraduate students' enrolments and programmes offered ranging from postgraduate certificates through to postdoctoral programmes. The UDSM was also selected because it is a focal point of research undertaking in Tanzania, whereas many scholars include postgraduate students in various disciplines are actively engaged in research.

The population of the study comprised postgraduate students from the University of Dar es Salaam at MJKN Mlimani campus. The study used stratified sampling to select three (3) colleges and one (1) school from which 132 samples were proportionately drawn using simple random sampling technique. Data were collected using questionnaire and documentary review methods. A self-administered

University of Dar es Salaam Library Journal
Vol 17, No 2 (2022), pp 188-203
ISSN: 0856-1818

questionnaire guide with both open-ended and close-ended questions was administered to 132 postgraduate students. A total of 104 questionnaires were successfully completed and returned, which is a 79% response rate. Demographic characteristics of the respondents that include sex programme level and age group are summarized in Table 1.

Table 1: Postgraduate Students Sex, Programme Level and Age Group (n=104)

Variable	Attribute	Postgraduate Students	
		F	%
Sex	Male	56	53.8
	Female	48	46.2
	Total	**104**	**100.0**
Programme Level	Postgraduate Diploma (PGD)	4	3.8
	Masters (MA)	76	73
	Doctor of Philosophy (PhD)	24	23.1
	Total	**104**	**100.0**
Age Group (Years)	21-30 years	39	37.5
	31-40 years	43	41.3
	41-50 years	22	21.2
	Total	**104**	**100.0**

Table 1 shows that the proportion of male respondents was relatively higher (53.8%) as compared to their female counterparts (46.2%). The higher proportion of male respondents reflected available statistical data of postgraduate students 2018/2019 from the Directorate of Postgraduate Studies (DPS) which showed that the number of registered male postgraduate students was higher with 1,630 (58%) compared to 1,166 (42%) female. Hence, gender representation in this study was considered fair across all levels of postgraduate studies programmes. Regarding programme level, participation of postgraduate students from Master programmes was higher than those from PhD and Postgraduate diploma programmes. This is also a fair representation due to the fact that it reflected enrolment of masters' students who were relatively more than PhD and postgraduate diploma students. Furthermore, regarding respondents' age groups, majority of respondents who participated in this study are in the young age group 31-40 years, followed by those in the 21-30 years age group. Based on the age distribution, all age groups of postgraduate students were fairly represented in this study.

Quantitative data were organized, coded and analysed using Statistical Package for the Social Science (SPSS) to derive frequencies, percentages, and mean and presented in tables and graphs. Qualitative data were analysed using content analysis techniques and presented in narrative form and quotations.

Respondents' Level of Awareness on Reference Management Software

The first specific objective of this study was to assess the level of awareness among postgraduate students on RMS. Level of awareness was an important variable in assessing and explaining postgraduate students' attitudes and use of RMS. The

University of Dar es Salaam Library Journal
Vol 17, No 2 (2022), pp 188-203
ISSN: 0856-1818

underlying assumption was that attitudes and decision to use RMS are strongly influenced by postgraduate students' level of awareness on RMS. The variable was measured using indicators such as respondents' knowledge of RMS and how it functions.

Respondents' Knowledge of RMS

Researchers wanted to find out if postgraduate students were aware of RMS because it is an important determinant for creating favourable attitude towards RMS and its eventual use. Thus, respondents were asked to indicate if they know RMS, specific types known and how they became aware. The findings are illustrated in Figure 2.

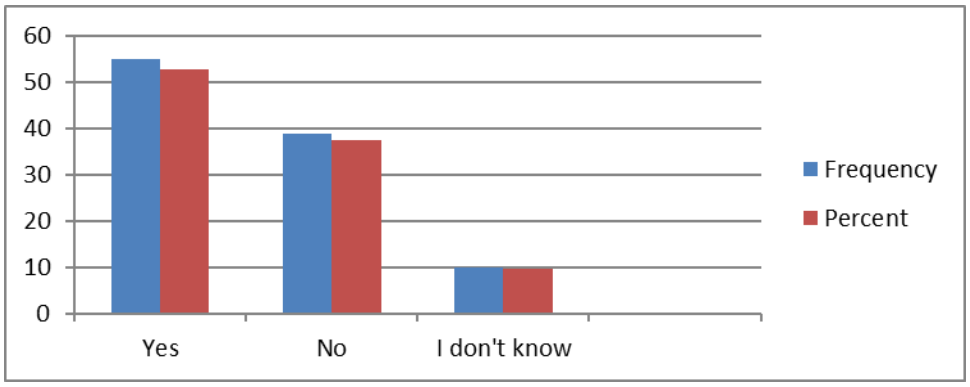

Figure 2: Respondent's Knowledge of RMS

Findings show that majority of postgraduate students that is 55 (52.8%) are familiar with RMS as compare to 39 (37.5%) who were not aware. The researchers also wanted to find out specific types of RMS that respondents know. Understanding the types of RMS known was an important follow up item meant to identify the most popular RMS. Here, only respondents who indicated to be aware of RMS in the previous question were asked to respond. The results were summarized in Table 2:

Table 2: Type of RMS Known by Respondents (n=55)

RMS	**Awareness**	
	Frequency	Percent
Mendeley	31	56.3
EndNote	19	34.5
Reference Manager	10	18.1
Zotero	8	14.5
RefWorks	7	12.7
Bookends	7	12.7
Bibdesk	3	5.4
BibTex	2	3.6
CiteULike	1	1.8

University of Dar es Salaam Library Journal
Vol 17, No 2 (2022), pp 188-203
ISSN: 0856-1818

The results of this study indicated that respondents are aware of multiple RMS, but at different levels. The ones known by many postgraduate students include Mendeley, followed by EndNote and Reference Manager. The results show further that Mendeley is the most widespread RMS among postgraduate students at the university.

The researchers wanted to find out specific methods used by postgraduate students to become aware of RMS. The underlying assumption was that innovation spreads through different communication channels. Only respondents who indicated to be aware of RMS were asked to indicate the methods through which they became aware. The results are summarized in Table 3:

Table 3: Respondents' Methods Used to Become Aware of RMS (n=55)

Method	**Responses**	
	Frequency	**Percent**
Colleagues	21	38.1
Orientation	17	30.9
Lecturers	17	30.9
Internet	13	23.6
UDSM websites	7	12.7
Librarians	5	9.1
Notice boards	1	1.8
OUT Training	1	1.8
COTUL Training	1	1.8

Based on the findings there are multiple ways both formal and informal through which respondents became aware of RMS. Results further show that there were four dominant methods used by postgraduate students to know about RMS such as colleagues, orientation, lecturers and Internet. Colleagues as personal and informal method seem to be at the top of the range.

Respondents' Understanding of How RMS Function

The researchers wanted to know whether respondents who were aware of RMS, know how it functions. The underlying assumption is that if one knows how a system functions, one is more likely to apply it compared to one who perhaps has general knowledge about a system but doesn't know how such a system functions. The findings are summarized in Figure 3:

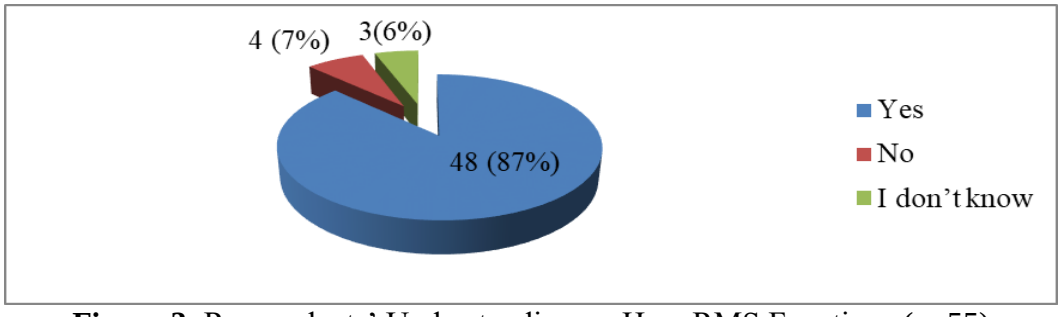

Figure 3: Respondents' Understanding on How RMS Functions (n=55)

University of Dar es Salaam Library Journal
Vol 17, No 2 (2022), pp 188-203
ISSN: 0856-1818

Results in Figure 3 show that majority of respondents 48(87%) known how RMS functions as compared to those who do not know 4(7%) and those who were not sure 3(6%).

The researchers wanted to find out specific RMS functions known from respondents who indicated to know them. The results are shown in Table 4.

Table 4: Known Functions of RMS (n=48)

Major Functions	Responses	
	Frequency	Percent
Generating references	45	81.8
Making citation	43	78.1
Storing documents	16	29
Sharing information	19	34.5

Results in Table 4 show that 45(81.8%) respondents mentioned generating references and making citations 43 (78.1%) as the most known functions of RMS, followed by sharing information and storage of documents.

Respondents' Attitudes on the Use of RMS

The second specific objective of the study was to assess postgraduate students' attitudes towards RMS. Attitude is a key factor influencing postgraduate students' decision to use or not to use RMS. The variable was measured using two indicators that are perceived usefulness and perceived ease of use. The question was directed to respondents who indicate to be aware of RMS and findings are summarized in Table 5:

Table 5: Respondents' Perceptions on RMS (n=55)

Category	Responses	
	Frequency	Percent
Useful	44	80
Easy to use	29	52.7

The findings revealed that most postgraduate students perceive RMS to be useful as indicated by 44 (80%) respondents and 29 (52.7%) respondents who perceived it to be easy to use. The results further show that postgraduate students have favourable attitudes towards RMS as evidenced by both indicators; mainly by perceived usefulness, which is the stronger determinant.

Respondents Usage of RMS

Researchers wanted to know if respondents actually use RMS. To achieve this, only respondents who declared to be aware of RMS were asked to indicate if they use RMS or not. The findings are presented in Table 6:

University of Dar es Salaam Library Journal
Vol 17, No 2 (2022), pp 188-203
ISSN: 0856-1818

Table 8: Respondents Use of RMS (n=55)

Category	Frequency	Percent
Yes	21	38.1
No	25	45.5
I don't know	6	10.9
Non Response	3	5.5
Total	**55**	**100.0**

Results in Table 6 show that 25(45.5%) of the respondents do not use RMS compared to 21 (38.1%) who do. The results further revealed that relatively large proportion of postgraduate students who were aware of RMS and have positive attitudes do not use it in managing their references.

With regard to non-use behaviour, the researchers wanted to know why postgraduate students do no-use. An open-ended question was directed to postgraduate students who indicated that they do not use RMS. Findings revealed that two main reasons why postgraduate students do not use RMS are lack of competency and low level of awareness. Furthermore, the researchers wanted to know for which academic works, the postgraduate students use RMS. This was an important indicator of postgraduate students' characteristic of RMS use. The question was directed to those who indicate to use RMS. The findings are summarized in Figure 4.

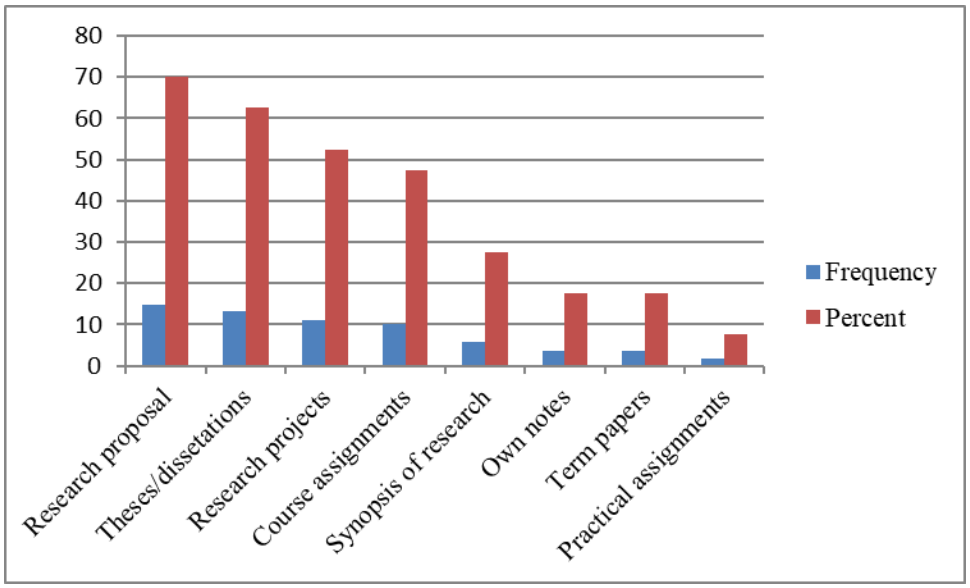

Figure 4: Academic Works for which RMS was Used (n=21)

Figure 4 shows that respondents use RMS in diverse academic areas of their academic works, but at varying degree. Results show that the most common areas of RMS use in academic works include research proposal, theses/dissertations, research projects and course assignments. These results revealed that RMS is not equally applied in all postgraduate students' academic works.

University of Dar es Salaam Library Journal
Vol 17, No 2 (2022), pp 188-203
ISSN: 0856-1818

Challenges of Using RMS

The researchers wanted to know the challenges faced by postgraduate students when using RMS. The question was directed to those who indicated to use RMS. The results are illustrated in Table 7.

Table 7: Challenges Faced by Postgraduate Students in Using RMS (n=21)

Category	Responses	
	Frequency	Percent
Lack of skills	16	76.1
No technical service support	10	47.6
No Internet connectivity	9	42.8
Unreliable power supply	4	19

The findings of this study revealed that postgraduate students face multiple challenges in using RMS. Most common challenges include lack of skills, lack of technical services support, lack of internet connectivity and unreliable power supply.

The researchers wanted to get suggestions on how postgraduate students can overcome the challenges regarding usage of RMS. This was an open-ended question. Respondents' suggested that the university should train and retrain postgraduate students to overcome the skills gap. For example, one respondent stressed: *More training is needed at departmental level for all postgraduate students.*

It was also suggested that availability of technical services support to postgraduate students is critical to facilitate smooth usage of RMS. For example, one respondent commented: *"ensure readily availability of technical support".* This means technical support should be easily available when needed by postgraduate students. Furthermore, respondents suggested that internet connectivity and power supply should be improved to facilitate smooth functioning and use of RMS and to encourage its effective use by postgraduate students. One respondent commented:

> *The internet should be available 24hrs in all areas at the UDSM… and steady power supply is possible if the university will invest in automatic switch on standby generator to be used when there is no power supply.*

The quotation clearly shows the need for improving infrastructure at the university, with emphasis on stabilizing power supply.

Discussions

The general objective of the study was to assess usage of RMS by postgraduate students at the University of Dar es Salaam, Tanzania. The first specific objective of the study was to determine the level of awareness of RMS among postgraduate students at the university. Study findings have shown that majority of postgraduate students are aware of RMS, while slightly more than one third are not aware of the system. It was conceptualized that an individual who is aware of RMS is most likely to have positive

attitude and eventually make decision to use it. Awareness is also a function of communication channels used to spread RMS and time factors. Since most of the postgraduate students were familiar with RMS, it can safely be interpreted that communication channels used to spread it were effective. The presence of a relatively small proportion of postgraduate students who are not aware of RMS can be attributed to the fact that the concept of RMS as a technological tool is relatively new to some of them. The idea is that time is a vital factor for effective spreading of an innovation. The findings of this study slightly concur with results from a previous study by Francese (2012a) that show a majority of respondents were aware of RMS and less than one tenth of respondents were not aware.

Further results of this study indicated that postgraduate students at UDSM are aware of multiple RMS. The ones known by many postgraduate students include Mendeley, EndNote and Reference Manager. The results also show that Mendeley is the most widespread RMS among postgraduate students at the university. Mendeley is one of the latest RMS technologies and its popularity can be partly attributed to promotion and advertisement campaigns normally done on new products. These results are contrary to the findings from a previous study by Francese (2012a) which revealed that the mostly known RMS is EndNote (79%), followed by Reference Manager (32%), BibTex (28%), Zotero (19%) and Mendeley (18%).

Findings show that postgraduate students used multiple ways, both formal and informal, to became aware of RMS. Results also revealed that there were four dominant methods used by postgraduate students to know about RMS such as colleagues, orientation, lecturers and Internet. Colleagues as personal and informal method seem to be at the top of the range, while formal methods such as websites are at the bottom. The low score of websites can be attributed to the fact that RMS have not been formally integrated and supported by the university, hence not featured on the UDSM website. The results of this study slightly differ from a previous study by Sarrafzadeh and Hazeri (2014) which revealed that 40% of the respondents became aware of RMS through books, websites and journals, 27(5%) through libraries, (25%) through colleagues and (10%) through self-studies.

Results show that most postgraduate students know how RMS functions and only a small proportion does not know. These findings show that postgraduate students are more likely to have or form favourable attitudes towards RMS, which is very crucial in making decision to use or not to use the system. The findings of this study are consistent with the findings by Francese (2012b) which revealed that most respondents know how RMS functions.

Results show that commonly RMS functions known by most postgraduate students include generating references and making citations, while sharing information and storage of documents are moderately known functions. Similar studies have also shown that generating references and creating citations are the commonly known functions of RMS. For instance, the findings by Madhusudhan (2016) revealed that most commonly known functions of RMS include automatically generating reference lists (77%), arranging the number of references and compiling bibliographies (63%), saving references (58%), emailing reference lists (47%), downloading references (45%), sharing references with colleagues (38%), and changing citation styles (30%).

They also concur with results by Conrad et al. (2015) which revealed that major functions of RMS include creating citations, arranging documents, storing documents, and searching for documents.

The second specific objective of the study was to determine postgraduate students' attitudes towards RMS. The findings revealed that most postgraduate students perceive RMS to be useful and easy to use. Meaning that postgraduate students view that the use of RMS would potentially improve performance and quality of academic work and they would use less effort in performing their academic tasks especially in the areas of citations and references. The results further show that postgraduate students have positive attitudes towards RMS. Based on the assumptions made in the conceptual framework, the findings can be safely interpreted that most postgraduate students at UDSM have favourable attitudes toward RMS, hence more likely to exhibit actual use behaviour. These results can partly be explained by the fact that most postgraduate students perceived RMS as useful, which is a stronger determinant for favourable attitudes. Results can also be attributed to the fact that most postgraduate students are aware of RMS. The underlying assumption is that awareness of an innovation is an important prerequisite for favourable perceptions and ultimately use behaviour exhibited by individuals. The findings of this study relate to the findings obtained in the previous study by Childress (2011) which found that RMS was useful because it saved time for scholars including postgraduate students.

The third specific objective of the study was to determine use of RMS by postgraduate students at the university. Results revealed that more postgraduate students do not use RMS as compared to those who use it. Meaning that large proportion of postgraduate students who were familiar and have favourable attitudes towards RMS do not use it in managing references. This is contrary to the study assumptions that individuals' awareness and favourable attitudes tend to influence actual use behaviour. These results can partly be attributed to the function of intervening factors such as internet connectivity, reliable power supply and non-availability of technical support. Postgraduate student have also confirmed reasons behind non-use behaviour to include lack of competency and low level of awareness. The findings of this study were slightly different from previous findings by Parabhoi, Sahu, and Bhoi (2018) that revealed that a majority of respondents (59.37%) use RMS, compared to (40.62%) who do not.

Results show that postgraduate students use RMS in diverse academic areas of their academic works, but at varying degrees. Results show that the most common areas of RMS use in academic works include research proposal, theses/dissertations, research projects and course assignments. Meaning RMS is not equally used in all postgraduate students' academic works, which is in line with the study assumption. These results were slightly similar with findings of a study by Madhusudhan (2016) which revealed that RMS is mostly used for research work including thesis /dissertation reports and project works (78%), followed by literature review (40%), completion of seminar presentations / assignments (32%), and publishing articles (17%).

The last specific objective of the study was to find out challenges faced by postgraduate students in using RMS. The findings of the study revealed that most common challenges faced by postgraduate students include lack of skills, lack of technical services support,

lack of internet connectivity and unreliable power supply. These results validate the assumption that postgraduate students' use of RMS is dependent on context of use. The assumption was that challenges tend to moderate the process of using of RMS. The results concur with a study by Parabhoi et al. (2017) that also identified challenges facing postgraduate students when using RMS.

In view of solutions, postgraduate students suggested that the university should provide training, technical support, internet connectivity and stable power supply. The ideal of training solution is also shared by Burgstahler (2003) who views training as a critical factor for addressing the question of skills shortages. The idea of provision of technical support is in line with a suggestion made by Melles and Unsworth (2015) on the importance of increasing technical support RMS users. The suggestion to enhance internet connectivity is also shared by Breshears (2017) and Eligi and Mwantimwa (2017) on the need for improving internet connectivity with a view to increase use of different information technologies.

Study Implications

The results of this study have implications for theory, policy and practice regarding usage of RMS. The study results have implications on the existing body of knowledge, particularly in understanding the use of RMS in relation to individuals' awareness and attitudes factors in the university context. The results also shade light on the role of colleagues as trustworthy communication channels for diffusion of new products. Furthermore, the study results have implications on institutional policy regarding RMS integration and use in university. Lastly, the results of this study have implications on reference management practices, specifically in terms of training, technical support and infrastructure.

Conclusions and Recommendations

Based on the findings, this study concludes that most postgraduate students at the UDSM are aware of multiple RMS and the most commonly known types include Mendeley and EndNote, which they became aware of through multiple methods and the most dominant method being colleagues. The study further concludes that even though most respondents know how RMS functions, but they lack actual requisite practical skills on how to actually use them. Furthermore, the study concludes that majority of respondents perceive RMS as useful and easy to use. The findings also confirmed the assumption that awareness of RMS influences individuals' attitude towards RMS, as evidenced by majority of postgraduate students who exhibited favourable attitudes against the minority who depicted unfavourable attitudes. The study concludes that the actual use of RMS by postgraduate students is not impressive regardless of their familiarity and positive attitudes toward RMS. Regarding characteristic of use, it was confirmed that application of RMS by postgraduate students is not equally the same in all academic works. It is concluded that postgraduate students encounter multiple challenges in using RMS and lack of skills being the major challenge constraining

effective use of RMS. The overall conclusion is that usage of RMS by postgraduate students at UDSM is low; hence RMS is not effectively utilized.

Furthermore, the study makes several recommendations in order to enhance use of RMS by postgraduate students. Effective use of RMS requires users to have adequate knowledge of using them; hence it is recommended that regular trainings on the use of RMS should be provided to postgraduate students based on their needs. It is further recommended that the RMS component should be integrated in the UDSM curriculum to formally introduce postgraduate students to RMS, its functionalities and how to deploy it for different tasks. It is also recommended that the use of RMS should be made compulsory for all postgraduate students at UDSM and be integrated in their course assessment. Moreover, the study also recommends that deliberate efforts be made to use competent colleagues as peer educators to train and increase awareness and ultimately use of RMS. Last but not least it is recommended that power supply should be improved to ensure reliable electricity is available all the time.

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