Reference Management Software for Academic Writings: The Experience, Challenges and Determinants of Usage in Port Harcourt

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ABSTRACT

Introduction: Modern reference management software (RMS) are developed to ease the work that was earlier done manually. Though the adoption of reference management software has been reported to be poor in developing countries with emphasis on training, it has been used by researchers in academic institutions across the globe to ease the act of collecting, storing, reporting, organizing and using information.

Materials and methods: A descriptive cross-sectional study was carried out among post-graduate students and lecturers in educational facilities in Port Harcourt Nigeria, and other lovers of academic writings using questionnaire. Data obtained was formed into tables and analyzed using the IBM Statistical Package for the Social Sciences (SPSS) version 25.0 (or 26.0).

Results: A total of 406 participants from at least seven academic institutions were recruited. Lecturers formed 48.03% (195) of participants and more than two-third were post-graduate students and lecturers. The majority - 81.03% (329) - were aware or knew about an RMS, and a little below half - 44.09% (179) - had never used any RMS for academic writing. Among individual respondents who use RMS, EndNote usage was 23.89% (97), followed by Mendeley 13.79% (56) and Zotero 4.68% (19). There were challenges encountered in the use of RMS in Port Harcourt.

Conclusion: The awareness of RMS was high among respondents, but the usage was low. Effort should be made through workshops and institutional policies, and support to encourage and mobilize more usage, towards harnessing the benefits associated with the use of the (RMS) for research development.

Keywords: Reference Management Software, EndNote, Mendeley, Referencing Tool, Usage and Challenges, Port Harcourt, Nigeria.

INTRODUCTION

Academic writings are often associated with references, giving credit to the authors/publishers. Additionally, academic referencing is known to assist in validating arguments, avoid plagiarism and enable readers to have a good idea of the information follow up, if necessary. The importance of academic referencing has been stressed,[1] and can be seen when publishing a part or whole of academic writings without permission or proper referencing, which could imply a form of theft of intellectual property. This also applies to internet-based resources.[2] Referencing (academic) has been defined as "the practice of acknowledging in an academic text the intellectual work of others; work that has been presented formally into the public domain and is still accessible in some way".[3] There are different referencing styles (including APA (from the American Psychological Association), Chicago, Harvard, Vancouver, etc.), and the choice of its usage is dependent on the professional body, institutions and publishers involved, and also the familiarity of the user with the referencing style.[3]

The history and evolution of academic referencing have been documented.[4] Modern reference management software has been developed to ease the work that was earlier done manually.[5] Available automated reference managers include: EndNote, Mendeley, Read Cube, RefMan, RefWorks, Reference Manager, Zotero, etc.[5, 6] Mendeley, Read Cube and Zotero are known as open-source citation reference managing tools that are freely downloadable online,[7] while EndNote software, Reference Manager, RefWorks and Papers (Mac) requires purchase before installation and hence belong to a paid category.[8] EndNote is also available as a cite-while-you write (CWYW) plug-in addon in Microsoft Office.[8] However, an attempt has been made in differentiating between reference management/citation management tools in general and Reference Management Software.[9, 10]

As the population of our country is growing, so do the population of youths enrolling in educational institutions. To keep pace with this, more institutions are being established with more professionals engaged in service, teaching and research. The benefits of automated reference management software can be explored to ease and encourage more research. The use of manual references is tedious and requires typing-in the references at the end of the work, back-and-forth for each reference. While using the manual reference, the researcher bears the responsibility of painstaking formatting or arrangement of the reference work – the name of the author(s), the title of the article, the name of the

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journal (or book with editor and place of publication), year of publication, issue and volume. This difficult task is taken over by the automated reference software through the click of a button.[5] This study, therefore, focuses on awareness and usage of reference management software among researchers, with the aim of determining the awareness, usage, and challenges associated with Referencing Management Software for Academic Writings in institutions in Port Harcourt, Nigeria.

MATERIAL AND METHODS

A descriptive cross-sectional study was done in Port Harcourt, the capital of Rivers State, in the Federal Republic of Nigeria, was the study area for this study.

Study Place and Period: The study was carried out in academic institutions of higher learning (Universities, Polytechnics, Teaching Hospitals) in Port Harcourt, from November 2020 and February 2021.

Study Population: The study was carried out among lecturers, students, and other lovers of academic writings.

Sample Size Determination: The minimum sample size of 400 was determined using the formula for survey developed by Yaro Yamen based on the estimated population of Researchers in Port Harcourt estimated to be 4,000.

$n = \dfrac{N}{1+Ne^2}$ where n = minimum sample size, N = Estimated Total population size (of Researchers) and e = desired precision/level of significance, usually 5% (0.05) at 95% Confidence Interval (CI). Hence, n = 5,000/ 1+5,000 X 0.05^2 = 399.9 being approximately 400.

Sampling Technique Procedure: The convenience sampling method was used to recruit 406 participants. All the lecturers and post-graduate students contacted, and who gave their consent were included in the study. A total of 500 semi-structured questionnaires were distributed and 406 were retrieved.

STATISTICAL ANALYSIS

The Cronbach alpha (in SPSS) was used for the validity of the study instrument. Information on respondents' socio-demographic data, knowledge of available reference management software, usage of reference management software, challenges encountered with reference management software, and determinants of usage of reference management software, were recovered. The study data was scrutinized by all the authors for authenticity or otherwise, before use, collation and analysis were done using the IBM Statistical Package for the Social Sciences (SPSS) version 25.0.

RESULTS

A total of 406 participants from at least seven academic institutions were recruited for the study, out of which 62.07% (252) were males, and 37.93% (154) were females (See Table 1). Respondents within the age ranges 25-40 years were 47.04% (191), while 38.18% (155) were respondents between 41-60 years age range. Most of the respondents were married, 63.79% (259). Christians were 91.63% (372)

Variables	n	Percent
Sex		
Male	252	62.07
Female	154	37.93
Age (years)		
<25 years	24	5.91
25-40 years	191	47.04
41-60 years	155	38.18
> 60 years	36	8.87
Marital Status		
Married	259	63.79
Single	106	26.11
Separated/Divorced	41	10.10
Religion		
Christianity	372	91.63
Islam	25	6.16
Traditional	5	1.23
Others	4	0.99
Number of years in service		
Less than 1 year	11	2.71
1-5 years	116	28.57
5-10 years	97	23.89
10-15 years	98	24.14
15-20 years	54	13.30
>20 years	30	7.39
Category of Respondents		
Lecturer	195	48.03
Student (Postgraduate)	160	39.41
Student (Undergraduate)	11	2.71
University Staff	5	1.23
Any Other	35	8.62
Institution of Training		
Rivers State University	105	25.86
Ignatius Ajuru University	89	21.92
University of Port Harcourt (UP)	85	20.94
University of Port Harcourt Teaching Hospital (UPTH)	57	14.04
PAMO University of Medical Sciences (PUMS)	24	5.91
College of Health Technology & Nursing	19	4.68
Other Institutions	27	6.65

Table-1: Socio-Demographic Data of respondents (n=406)

Variables	n	Percent
Do you know any RMS used for academic purposes		
Yes	329	81.03
No	77	18.97
Types of RMS known (n=329)		
EndNote	133	40.43
Mendeley	85	25.84
Zotero	30	9.12
RefWorks	23	6.99
ReadCube	17	5.17
RefMan	17	5.17
All of the above	22	7.29

Table-2: Knowledge of Available Reference Management Software (n=406)

of the study population. Lecturers formed 48.03% (195) of participants and those who had worked between 1-5 years were 28.57% (116).

Table 2 shows that most of the respondents - 81.03% (329) - were aware or knew about a Reference Management Software. Only a small proportion, 18.97% (77) did not know of a Reference Management Software. Awareness of EndNote among respondents was 40.43% (133); followed by

Mendeley - 25.84% (85); and Zotero 9.12% (30). Only 7.29% (22) of respondents knew or were aware of the existence of all-three reference management software.

Table 3 shows respondents usage of reference management software (RMS) for academic writing. The study revealed

Variables	n	Percent
Type of RMS you use for academic writing purposes		
EndNote	97	23.89
Mendeley	56	13.79
Zotero	19	4.68
RefWorks	16	3.94
RefMan	15	3.69
ReadCube	12	2.96
All of the above	12	2.96
None of the above	179	44.09
Type of RMS commonly used in your institution		
EndNote	99	24.38
Mendeley	51	12.56
RefWorks	16	3.94
Zotero	14	3.45
ReadCube	8	1.97
RefMan	7	1.72
All of the above	26	6.40
None of the above	185	45.57

Table-3: Usage of Reference Management Software (n=406)

Variables	n	Percent
Encounter challenges (n=227)		
Yes	175	77.09
No	52	22.91
Type of challenges encountered in the use of RMS (n=175)		
Malfunctioning of software	67	38.29
Lack of Knowledge of how to use it	62	35.43
Expensive to purchase	46	26.29

Table-4: Challenges encountered with Reference Management Software (n=406)

Variables	n	Percent
Factors determining your choice of RMS use (n=243) (Multiple responses applicable)		
Ease of learning how to use	67	27.57
The cost of acquiring the software	61	25.10
Availability of the software	52	21.40
Slow or poor internet connection	37	15.23
Availability of tutors at workshops that teaches how to use the software (Technical support)	26	10.70

Table-5: Determinants of usage of Reference Management Software (n=406)

Variables	RMS Usage		Total	df	χ^2 (p-value)
	Yes Freq (%) n=191	No Freq (%) n=179			
Age					
<25 years	14 (58.33)	10 (41.67)	24 (100.0)		1.89 (0.596)
25-40 years	89 (49.44)	91 (50.56)	180 (100.0)	3	
41-60 years	72 (53.73)	62 (46.27)	134 (100.0)		
> 60 years	16 (50.0)	16 (50.0)	32 (100.0)		
Gender					
Male	120 (52.40)	109 (47.60)	229 (100.0)	1	0.076 (0.782)
Female	71 (50.35)	70 (49.65)	141 (100.0)		
$\chi 2$ = Chi-Square					

Table-6: Association between age, sex and RMS usage

Variables[μ]	RMS Usage		Total	df	χ^2 (p-value)
	Yes Freq (%) n=181	No Freq (%) n=160			
Category of respondents					
Leturers	103 (59.54)	70 (40.46)	173 (100.0)		
Students (Undergrad/Postgrad)	78 (46.43)	90 (53.57)	168 (100.0)	3	5.86 (0.015)*

*Statistically significant (p<0.05), $\chi 2$ = Chi-Square μThose that were neither students/lecturers were removed from the comparative analysis as our interest were only for these two variables

Table-7: Association Between the Category of Respondents and RMS Usage

that 44.09% (179) of respondents never used any RMS for academic writing. Also, 45.57% (185) of respondents were of the opinion that there was no commonly used RMS in their institution. In institutions where RMS was commonly used, EndNote usage was 24.38% (99), followed by Mendeley 12.56% (51), and RefWorks, 3.94% (16). Among individual respondents who use RMS, EndNote usage was 23.89% (97), followed by Mendeley 13.79% (56) and Zotero 4.68% (19). One hundred and seventy-nine (44.09%) were not using any of the reference management software.

Table 4 shows the opinion of respondents on the challenges encountered in the use of RMS in Port Harcourt. Most of the respondents - 77.09% (175) experienced some form of challenges with the use of an RMS, with the most encountered being malfunctioning of software - 38.29% (67); lack of knowledge of how to use it RMS was a challenge among 35.43% (62) of respondents; while some - 26.29% (46) - felt that it was expensive to purchase.

Determinants of usage of Reference Management Software are shown in Table 5. The ease of learning how to use the RMS was opined by 27.57% (67) of respondents; followed by the cost of acquiring the software, indicated by 25.10% (61) of respondents; availability of the software, was 21.40% (52); the slow or poor internet connection was an issue among 15.23% (37) of respondents; and availability of tutors at workshops that teaches how to use the software (technical support) was stressed by 10.70% (26) of respondents.

No statistically significant association was shown between respondents age, gender and RMS usage as the p-value >0.05 (See Table 6).

In the present study, we observed a statistically significantly higher usage of RMS among lecturers compared to students (59.54% vs. 46.43%) (p=0.015) as indicated in Table 7.

DISCUSSION

The demographics of this study shows that respondents within 25-40 years were more than others, then closely followed by those within 41-60years. This is expected in a dynamic academic setting where older academicians are retired and younger ones are recruited. The majority of respondents have worked in their institutions for at least 5years. This suggests that the opinion of respondents on the use of reference management software is therefore genuinely borne out of the years of experience. Nearly half of the respondents were lecturers, and more than two-third were post-graduate students and lecturers.

The majority of respondents knew or were aware of the use of reference management software for academic writing, especially EndNote, Mendeley and Zotero. EndNote the most known software followed by Mendeley. Less than 10% of the respondents were aware of the existent of the three software. The findings of our study on awareness are similar to another study in Ghana where it was reported that the use of reference management software was low though 80% of the researchers were aware of its existence.[11] Our study did not find any influence on age and sex in the usage of reference management software. This finding is different

from a Ghanaian study where non-usage was noted to be more among older scientists in the Ghanaian study.[11] The proportion of non-users who were aged below 40years was higher in our study compared to those below forty years. However, our study demonstrated a significant difference in the usage between lecturers and students, in favour of the lecturers. This is expected as the lecturers are the teachers of this improved way of referencing. The Endnote Referencing Workshop organised by the University of Port Harcourt for Lecturers and postgraduate students in the City of Port Harcourt in July 2019 may have been directly or indirectly responsible for this difference in findings.

EndNote, one of the most widely used tools in research,[12] described as heavy-weight reference management software with extensive functionality,[8] is a product of Clarivate Analytics, the world's largest citation database.[12, 13] It enables the creation of a library (database) from which citations and references are made. Mendeley is a free reference software developed by a Web 2.0 start-up in 2008 with web and desktop version, and capable of sharing references between users.[5, 14-16] Zotero (an Albanian language meaning "to master or acquire")[17] was developed by the Center for History and New Media of the George Mason University in 2006.[5, 18] It is an open-source free plug-in software for Firefox browser,[15, 19] whose alpha version is known to be capable of working on Windows, Linux, and Mac OS.[5] A business unit of ProQuest is credited with developing the web-based, fee-based RefWorks software in the year 2011, and it is obtained by both individuals and institutions.[5] Though the adoption of reference management software has been reported to be poor in developing countries with emphasis on training,[20] it is being used by researchers in academic institutions across the globe to ease the act of collecting, storing, organizing and using information.[7] The advantages and disadvantages of each software have also been reported.[7, 21] The paid reference software are known to have fewer frustrations and limitations.[8]

The most commonly used reference management software was the EndNote, used by about one-fifth of the total population of respondents. Institutional usage followed a similar pattern. This connotes low usage, and is similar to a study carried out in Ilorin, Nigeria where low use of reference management software was reported, with Endnote and Mendeley being the most commonly used.[22] Another researcher in Minna, Nigeria reviewed the use of Mendeley reference software and its associated benefits.[23] Almost half of our respondents did not use any of the reference management software for academic writing. This implies that the usage of reference management software among academicians in Port Harcourt is still suboptimal, pointing in the direction of more action for improvement. Unlike our setting, these software have long been in use in the United States,[24-27] Asia,[28] Europe,[29] etc.

The majority of users of reference management software in our study encountered one form of challenge or the other, with the most common challenge being software malfunction. Others did not have knowledge of how to use it,

while a few others assert that cost (expensive) was an issue. These same issues, in addition to the availability of tutors (or technical support) and internet connectivity, formed the determinants of usage of reference management software in Port Harcourt. These findings are similar to those reported in Ghana, in which associated challenges were identified as the inadequacy of training, poor internet connection and absence of supporting technical teachers or workshops were reported.[11]

CONCLUSION

The awareness of reference management software was high among respondents, but the usage was low. EndNote was the most commonly used reference management software, and there were challenges associated with usage including outright lack of knowledge of how to use it. Effort should be made by academic institutions to encourage the usage of reference management software for academic writing, by way of workshops and institutional policies, etc. to harness the benefit associated with the use of the software.

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