



Research article

Awareness, knowledge, and utilisation of online digital tools for literature review in educational research

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ABSTRACT

There is an inequality in developed and developing countries' research output in highly reputable databases. One way to reduce this inequality is to encourage researchers in developing countries to use online digital tools. This article examines the contribution of lecturers' awareness and knowledge to utilising the free online digital tools (FODT) available for literature review in the field of education. A correlation research approach involving 180 academic staff in tertiary institutions in southern Nigeria was adopted, using descriptive statistics and regression analysis. A structured questionnaire elicited the participants' awareness, knowledge, and utilisation of the free online digital tools available for literature review. The findings indicate a low level of awareness, knowledge, and utilisation of the FODT. The two regression models revealed that the lecturers' level of awareness and knowledge accounted for significant contributions to the level of the lecturers' utilisation of the FODT. These results demonstrate a link between lecturers' level of awareness and knowledge to their utilisation of the FODT. It was recommended that stakeholders in research and education create awareness of the availability of these FODTs, carry out workshops on how to use them and replicate this study in other developing countries.

1. Introduction

It appears that some researchers in developing countries are not using Free Online Digital Tools (FODT) for literature review. If this is true, it is important to examine the probable answer to this hypothesis: Could it be that these researchers are not aware of the availability of the FODT and what they are used for? Research is a methodical procedure that requires the researcher to follow numerous steps. Problem identification, literature review, hypothesis development, study design, population and sampling, measurement instrument building, data collection, analysis and interpretation, discussions of study results, conclusion, and generalisation are the steps in good research. A thorough evaluation of previous relevant literature is an important part of any academic study since it helps as a robust basis for the other steps that make up educational research. A researcher cannot do substantial research on any subject without a good literature review, whether for a research study, a systematic appraisal, or a thesis [1,2]. A literature review is a

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stand-alone piece that examines the relationship between current and earlier discoveries on the same subject [3]. It is an exercise where the researcher identifies, locates, reads, and evaluates prior studies, views, and comments relevant to the study the investigator is conducting [4]. A literature review is a detailed synthesis and critical examination of all relevant research literature on the issue under consideration. Any successful literature review should methodologically analyse and synthesise high-quality literature, offer a foundation for a study subject and technique, and show that the proposed research will contribute to the field's knowledge base [1,5].

Literature reviews have an important role in influencing educational policy and practice, future research and public perception of educational issues [6]. It exposes studies comparable to the planned research, gives techniques, insights, and strategies, and increases the researcher's confidence in the research topic. A literature review is essential for defining research issues, avoiding ineffective approaches, providing recommendations for additional research, and developing researcher skills and analytical procedures for the study [4,7]. Furthermore, a literature review educates researchers about important scholars and research organisations and defines the researcher's study aim [1,4].

Selecting a review subject, searching the literature, collecting, reading, analysing the literature, preparing the review, and compiling the references are all part of the literature review process [8]. The procedure of carrying out a literature review is fraught with difficulties. Some of these difficulties are cost and the fragmentation of the literature into multiple subject journals, multidisciplinary journals, and various association proceedings. Some academics have problems accessing the required material, making conducting a complete literature study more difficult. Additional issues include a lack of access to all databases, poor search engine quality, and difficulty receiving reliable results [1,9]. Copyright limitations and subscription fees have unexpected effects limiting access to peer-reviewed material and negatively impacting effective literature reviews [10]. Others included the cost of accessing papers in reputable journals, the lack of an e-library in developing nations, and the scarcity of high-impact journals in African libraries [11]. Researchers are also confronted with numerous publications published in various outlets, both online and hard copies. Keeping track of their references and remembering how to cite them in the text and reference sections may be an arduous effort for a novice researcher and a tiresome process for a seasoned scholar [12]. Vocabulary, sentence structure, grammatical accuracy, connectors, and transitional phrases are difficult for non-native English speakers [6]. Reviewing the literature with other researchers who do not live in one's region might be challenging. As a result of these difficulties, many literature reviews in developing countries are of poor quality.

Today, online technology is considered a relevant activity, and there has been a significant movement toward digital academic research. Researchers are encouraged to use digital research tools. As a result, these new means of leveraging information and communication technology for educational purposes rather than merely socialising are a welcome notion that may help address some problems with a thorough literature review [13]. Since 2013, many digital tools have emerged to aid literature searches, research authoring, reference tracking, journal choice, teamwork, networking, information sharing, and research marketing. There are approximately 400 digital tools available for various research tasks [14]. As the technology that links, empowers and enhances researchers becomes more widely adopted, the researchers will become more productive. Many instructional digital materials and activities are becoming available, dramatically altering how we conduct research. Researchers that employ digital tools, social media, websites, and applications in their study will be smarter [13,15–18]. Programs, websites, extensions, add-ons, and apps are examples of online digital tools that make jobs easier to perform. They are viewable in online browsers, and some may be downloaded.

There is a digital gap in ICTs, internet access, and internet usage between developed and developing countries [19,20,21]. The digital gap in ICT encompasses the availability of e-technology and other factors such as accessibility, cost, dependability, speed, awareness, knowledge, and application [22]. The usage of internet resources has a favourable influence on research output in industrialised nations, according to a survey of researchers in the United States [23], Russia [24], and the United Kingdom [25]. The number of research publications published in high-ranking journals from developing nations is still low [11,26]. There is a considerable productivity disparity between researchers in the global north and developing nations [27]. If African researchers are given equitable access to and use digital online resources, their research output might grow significantly. According to the findings, if African academics have access to appropriate internet resources and equipment, the quality of their research will improve, resulting in an increase in research productivity or publishing output in respectable international journals [11,28,29]. Various studies reveal that ICT and digital technologies in higher education in several developing nations are still low [30–32].

Furthermore, researchers who are not connected with any universities are excluded. Many developing-country scholars are unlikely to have access to paywall articles. Some researchers have patronised pirate websites for scholarly papers [33]. There is a need for a legal and simple way for all researchers to obtain unlimited access to literature [1]. That is why several free online digital tools (FODT) have arisen to assist scholars in doing literature reviews in a comfortable setting. Researchers in impoverished nations will benefit from using these online digital tools to better their literature reviews. When it comes to resource or tool usage, one issue immediately comes to mind: can anybody use something they do not know exists? The fact that there is awareness of the existence of a tool is a key predictor of its use. The awareness of the availability of resources/tools is an important factor that has been demonstrated to have a strong relationship with resource/tool utilisation [34,35]. Knowing what a resource or tool may be utilised for can impact human decisions or actions. Awareness of the existence of an online digital tool (awareness), as well as familiarity and comprehension of what it is used for (knowledge), are important variables in determining whether the online digital tool will be used effectively (utilisation).

Grosbeck and Bran [13] investigated the impact of digital and online technologies on academic research. They looked at the digital tools they have utilised to help their students with their studies. They focused their research on their encountered difficulties and how digital technologies have influenced academic research. They concentrated on digital tools that could be utilised for design, collaboration, and information retrieval. Suleiman and Joshua's [36] research focused on tertiary institution students' knowledge and use of Internet resources and services for academic purposes. The study's findings indicated that most respondents were aware of the e-mail. According to a survey conducted in India, 48.5% of participants were aware of internet resources and services [37]. In another study,

livestock researchers in Tanzania had little knowledge of online resources [38]. Also, Adetomiwa [39] study focused on awareness, knowledge, and utilisation of electronic databases. The study concluded that awareness, knowledge, and utilisation of electronic databases could improve the research productivity of academic staff.

Except for Grosseck and Bran's study, none of the others focused on online digital tools. Grosseck and Bran's research, on the other hand, did not look at the link between ODT awareness, knowledge, and use. Even though Adetomiwa's work was on awareness, knowledge, and utilisation, it only focused on electronic databases. None of these researches comprehensively examined the awareness, knowledge, and utilisation of free online digital tools for literature review among academic staff in tertiary institutions in developing countries. There is a pressing need to close these knowledge gaps. It is believed that a research study can provide helpful information to fill up these gaps. This research will go a long way toward helping stakeholders in research and education in developing countries raise awareness and improve researchers' knowledge of the available free online digital tools (FODTs). As a result, this study investigates the link between lecturers' awareness and knowledge to their utilisation of free online digital tools for literature review in education in a developing country.

1.1. Online digital tools

As defined in this article, online digital tools are any software, app, technology, extensions, add-ons, or websites that can be accessed via an internet connection and improve a researcher's capacity to conduct a thorough literature review. Online digital tools (ODT) help researchers write more effectively, become more aware of plagiarism and language mistakes, and collaborate with other researchers. Due to the COVID-19 pandemic, online digital tools have become popular and useful in the health and education sector [4014243444546]. These ODT decrease investment in terms of both time and money for researchers. It also guarantees a detailed examination of the literature. Several ODTs can help with the literature review. Researchers can utilise digital resources like Lazy Scholar, Preprints, Academia, Google Scholar, Unpaywall, Scopus, Web of Science, JSTOR, and EBSCO to find material relevant to their present research. Plagiarism checker X, Turnitin, Scribbr, Plagscan, Plagamme, Unichack, Quetext, Duplichecker, and other tools can do plagiarism tests. We use EverNote, readability, and nimbus screenshot to read the material. We can use Libreoffice, Microsoft

Table 1
Free online digital tools for literature review in education.

Free online digital tools	URL/Website	Usage
Literature search		
Research Gate	www.researchgate.net	For sharing articles and is also a discussion forum
Academia	www.academia.edu	Sharing open-access research papers and preprints
Google Scholar	scholar.google.com	Assistance researchers find scholarly literature via relevant keywords.
Preprints (MDPI)	www.preprints.org	Make early versions of research outputs available and citable.
Unpaywall	https://unpaywall.org/	Legally provide full or free-to-read versions of paywalled papers.
Reading the literature review		
Readability	Download from chrome webstore	It turns a link-heavy web page into a simple, clean, easy-to-read PDF document.
Evernote	Evernote.com	It can store and organise information for present and future usage. Reading the materials becomes easier.
Writing the literature review		
Google Docs	docs.google.com	Documents and spreadsheets can be formed, edited and stored online.
LibreOffice	www.libreoffice.org	It has programs for word processing, creating and editing documents, spreadsheets, graphs, and scientific formulae.
LaTex	www.latex-project.org/	It is a typesetting tool with special commands and math equations.
Reference manager		
Zotero	www.zotero.org/ Inbuild Firefox plugin	It can collect research materials, generate citations and build references.
Mendeley	www.mendeley.com	It stores documents and citations and adds references to documents.
Google Scholar Button	Browser extension for Firefox and Chrome	It is easier access to Google Scholar. It collects references from articles and also format references.
Software manager		
Extension manager	Chrome web store	Help to manage extensions.
Calibre eBook	Calibre-ebook.com	It is a personal automated library that manages books, journals, newspapers, and magazines.
Collaboration tool		
Overleafv2	www.overleaf.com	It allows real-time collaboration
Trello	www.trello.com	The researchers can create a board, assign people to tasks and communicate within the board.
Authorea	www.authorea.com	It is a collaborative writing tool that allows researchers to write, cite, collaborate, host data, and publish.
Editing tools		
Grammarly	www.grammarly.com	It scans documents for grammar, punctuation, and spelling mistakes. It also addresses clarity, engagement, and delivery level. It provides an appropriate replacement.
EditMinion	www.editminion.com/	It can proofread and polish content. It informs users of wrong adverb use, weak words, passive voice, and spelling mistakes.
ProwritingAid	https://prowritingaid.com	Identifies repeated words, phrases, cliches, redundant words, and spelling errors and fixes them.
Plagiarism tools		
Quetext	www.quetext.com/signup	It allows five free plagiarism checks every month.
Duplichecker	www.duplichecker.com/	It detects duplicate content and can analyse up to 1000 words. The result is downloadable in a PDF file.

Office, Google Docs, LaTeX, Scrivener, and other software to compose the literature. Zotero, RefWorks, Endnote, Mendeley, Refme, OhoBib, Paperrice, Docear, and the Google Scholar button are online digital applications that can assist researchers with citation and reference management. ODT for editing the literature review include Grammarly, Scribus, Editminion, Paperrater, ProwritingAid, Smartedit, After-the-deadline, and Cliché finders. When academics collaborate on a literature review, ShareLaTex, Overleafv2, Trello, Authorea, MediaWiki, and draft are some of the ODT that may make the process go well. Calibre eBook and extension managers are two online digital tools that can help us manage the many digital tools, extensions, or materials we are working with [47484950515253].

1.2. Free online digital tools (FODT)

Some of these ODTs are free, while others cost money. Some of them have a free and a premium (paid) version. Their free version will be enough for some researchers, and they will not need to upgrade to the premium version. Several of these ODT can be utilised for several purposes. For example, Google Docs can be used for collaboration, while Evernote offers social media sharing tools. Mendeley is a social network that facilitates document sharing and collaboration. The researcher can conduct a plagiarism test using Grammarly and ProwritingAid. However, this option is only available to premium users. Grammarly has positively influenced students' academic writing [54555657]. Google Scholar has provided information that has improved future research, scholarly networking and the ease of referencing articles [58,59]. Unpaywall is an indispensable tool in research [50,60,61]. Several studies have encouraged researchers and learners to use Trello [626364]. Studies have also shown that Quetext is a useful tool for detecting plagiarism, and researchers are encouraged to use it [65,66]. The URL and a brief remark about how to use some of these free online digital tools, as well as those whose free versions are adequate, are provided in Table 1.

Although there are various types and purposes for literature reviews, they may all be enhanced with free and open-source software. Previously, researchers had to pay for access to one or more of the main private repositories, such as Web of Science, JSTOR, Scopus, and EBSCO. However, some can get access through their universities. It is especially difficult for researchers who are not connected with universities and cannot afford to pay for these large archives. Researchers from developing nations, such as Nigeria, are also at a disadvantage because most tertiary institutions in these countries do not subscribe to these large archives.

1.3. Awareness, knowledge, and utilisation

A circumstance in which someone is made aware of something is known as awareness. Awareness is the capacity to be conscious of a new trend, such as new technology or system. The idea of awareness in this study refers to whether the academic staff in African tertiary institutions have heard about free online digital tools for literature reviews in education. Research has shown that raising awareness can help people change their behaviour [676869].

Knowledge is familiarity or comprehension of something or someone, such as ideas, information, descriptions, or abilities, gained by discovery or learning through experience or education [39]. The main distinction between awareness and knowledge is that knowledge implies a thorough comprehension and acquaintance with a subject or technique, whereas awareness does not. It appears that awareness and knowledge are inextricably linked. There is some knowledge in both circumstances. While awareness is a broad understanding of the free online digital resources that may be utilised for literature review, knowledge is a more thorough and specialised understanding of using these tools. It is like a continuum, with awareness on the lower end and knowledge on the higher end [70]. According to this study, if academics in developing nations have not heard of the FODT, they are unaware of it. If they have a precise idea of what they are used for, they are knowledgeable about it.

The word "utilisation" means to use, and "use" refers to putting something into action or providing a service that can be helpful to someone [39]. The capacity of a researcher to learn to use obtained information on the FODTs is the idea of usage. Use involves

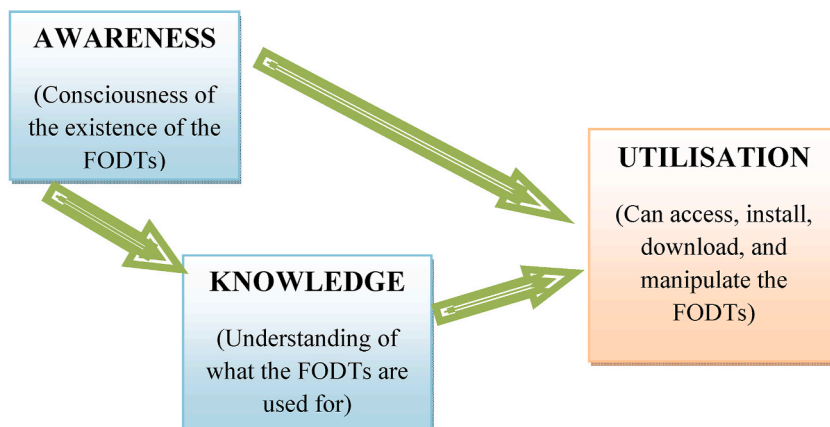


Fig. 1. Relationships between awareness, knowledge, and utilisation.

accessing, installing, downloading, copying, and manipulating the FODTs. The importance of awareness and knowledge in deciding scholarly communications in higher education has been recognised [39,71–74]. The acquisition of information about a digital tool can be influenced by awareness of the device, which might impact the tool's use. Fig. 1 illustrates these connections. The utilisation of the FODTs is the dependent variable. Awareness and knowledge of the FODTs are the independent variables. Knowledge of the FODTs can also be seen as a mediating variable between awareness and utilisation of the FODTs.

There are several theories on how digital technologies are accepted and used. According to the Self-determination theory (SDT), long-term behaviour is predicted when a person's objectives and values are more internalised. Motivation from awareness and knowledge can help to improve competence and utilisation [75]. The Diffusion of Innovation Theory (DOI) was created to determine how technology spreads across social systems. The choice to embrace or reject an invention is ultimately based on personal knowledge about the innovation. The individual's attitude toward using it is formed due to this information [39].

2. Methods

We used the academic staff in faculty/school of education in tertiary institutions in southern Nigeria. There are three Geo-Political-Zones (GPZ) in south Nigeria, comprised of 20 states; (7 from South-South GPZ, six from South-East GPZ, and seven from South-West GPZ). Through the multistage sampling approach, two states were chosen randomly from each of the three GPZs; one institution was selected randomly from each of the six states. The six institutions have a sample frame of 402 academic staff (172 and 230 of the lecturers were from colleges of education and universities, respectively). The researchers randomly selected 30 academic staff members from the faculty/school of education in each of the six institutions. With a response rate of 78%, the sample size became 142 academic staff. About 48(33.8%), 45(31.7%), and 49(34.5%) of the 142 academic staff were from South-South GPZ, South-East GPZ, and South-West GPZ, respectively. Also, 72(50.7%) and 70(49.3%) lecturers were from universities and colleges of Education, respectively. The sample comprises 90(63.4%) and 52(36.6%) male and female academic staff. In addition, 12(8.5%), 71(50%), and 59 (41.5%) of the academic staff had B.Sc./B.A./B.Ed., M.A/M.Sc./M.Ed., and PhD certificates as their highest qualification respectively. Based on experience in conducting research: 33(23.2%), 69(48.6%), 17(12.0%), and 23(16.2%) of the lecturers had less than 5 years, 5–10 years, 11–15 years, and more than 15 years respectively. The sample also consisted of 29(20.4%), 46(32.4%), and 67(47.2%) academic staff with 5, 5–10, and more than 10 journal publications, respectively. The study was approved on June 28, 2021, by the head of the institution, the deformed College of Education Agbor, now upgraded to the University of Delta Agbor operationally in August 2021.

A structured questionnaire based on relevant literature was used as the study's tool. The questionnaire was divided into four sections. Section A contains questions on the respondents' biographical information. It included four questions on the type of institution, highest qualification, research experience, and the number of publications. Section B has a list of the 23 FODTs. Respondents were asked to mark yes or no, depending on their level of awareness. Section C also contains a list of the 23 FODTs. It had eight options indicating the uses of the FODT for literature review (plagiarism test, literature search, writing the literature, reference management, editing, software/apps manager, collaboration, and reading the literature). The respondents were asked to select one of these eight alternatives. The selection should be based on their perceptions of how the 23 FODTs are utilised during the literature review. The ninth choice was "I do not know," which the respondent was meant to select if they were unsure about the purpose of the free online digital tools. Section D contains a list of the 23 FODTs; participants were expected to tick yes/no based on whether they used the FODT. The items in the questionnaire were validated by measurement and evaluation, educational researchers, and computer science experts. Also, the reliability of the instrument was done using Cronbach's alpha. It yielded 0.86, 0.76, and 0.82 for sections B, C, and D. In sections B and D, 'yes' was coded as 2, and 'no' was coded as 1. A percentage of 50 and above indicates a high level of awareness or utilisation, as the case may be. In section C, if the FODT usage was successfully recognised, it received two points; if it was incorrectly identified, it received one point.

Both soft and hard versions of the questionnaire were available. The researchers and three research assistants administered the questionnaire to the academic staff in their respective institutions. The participants were allowed to fill in a hard or soft copy. Participants were instructed to reply as honestly as possible to each issue. Before administering the questionnaire, consent from the institutions where the participants belonged was sought and secured. Each questionnaire took an average of 15 min to complete. It took the researchers two months to administer the questionnaire to the academic staff. The respondents' demographic data were summarised using a frequency count and a percentage estimate. While frequency counts, percentages, and bar charts were used to answer the study questions. Regression analyses were conducted to examine the effects of the lecturers' level of awareness and knowledge of the FODT on their utilisation of these FODT.

3. Results

3.1. Academic staff level of awareness, knowledge, and utilisation of the free online digital tools available for literature review in educational research

The lecturers' awareness, knowledge, and utilisation of Research Gate are 100(70.4%), 73(51.4%), and 82(57.7%), respectively; that of Academia was 107(75.4%), 66(46.5%), and 87(61.3%) respectively; and for Google Scholar it was 85(59.9%), 55(38.7%), and 66(47.9%) respectively. Also, the lecturers' level of awareness, knowledge, and utilisation of Preprints (MPPI) was 9(63%), 1(0.7%), and 2(1.4%), respectively, and that of Unpaywall was 22(15.5%), 6(4.2%), and 11(7.7%) respectively (Fig. 2). The awareness level of the lecturers for Research Gate, Academia, and Google Scholar was above 50%. It follows that the awareness level of the lecturers for

these three tools was high. Also, the knowledge level of the lecturers for Research Gate was above average, while that of Academia was a little below average. However, the utilisation level of the lecturers for Research Gate and Academic was above average, while that of Google Scholar was a little below average. The lecturers' awareness, knowledge, and utilisation level for Preprint (MDPI) and Unpaywall was very low (Fig. 2).

From Fig. 3, the awareness, knowledge, and utilisation levels of the lecturers for Readability were 42(29.6%), 18(13.4%), and 26 (18.3%), respectively, while that of Evernote was 32(22.5%), 0(0%), and 0(0%) respectively. All the percentages were below 50%. It implies that the lecturers' awareness, knowledge, and utilisation levels for the FODT for reading the literature were low.

The data in Fig. 4 shows that the lecturers' awareness, knowledge, and utilisation of Libreoffice and Latex are below 50%. The lecturers' awareness, knowledge, and utilisation of the two FODTs are low. However, for Google Docs, the lecturers' awareness level was above 50%, their knowledge level was very low, and their utilisation level was slightly below average.

The academic staff's awareness, knowledge and utilisation of Zotero, Mendeley, and Google Scholar Button were below 50% (see Fig. 5). This information indicates that their level of awareness, knowledge, and utilisation of these three FODTs is low. Fig. 6 shows that the academic staff's awareness, knowledge, and utilisation of the two FODTs for managing software are very low.

The lecturers' level of awareness, knowledge, and utilisation of the collaboration tools are very low (Fig. 7). The lecturers' level of awareness, knowledge, and utilisation of Prowritingaid and Editminion are very low. While that of Grammarly was not as low as that of Prowritingaid and Editminion (Fig. 8). The lecturers' level of awareness, knowledge, and utilisation of the plagiarism tools were very low (Fig. 9).

3.2. Prediction of lecturers' awareness and knowledge of FODT on their utilisation of the FODT for literature review in education

The correlation analysis in Table 2 shows a significant strong relationship between lecturers' awareness of the FODT and their utilisation ($r = .61, p = .00$). Also, there was a significant strong relationship between the lecturer's knowledge and utilisation of the FODT ($r = .68, p = .00$). Furthermore, a significant relationship was found between the lecturers' level of awareness and knowledge of the FODT ($r = .45, p = .00$). It indicates that awareness of the FODT is related to acquiring knowledge about the FODTs. In addition, all the correlation indexes were positive.

We examined the impact of lecturers' level of awareness and knowledge on their utilisation of the FODT for literature review. In Model 1, we entered the variable awareness to predict lecturers' level of utilisation of the FODT. In Model 2, we entered the awareness and knowledge levels of the lecturers to predict their utilisation level of the free online digital tools for literature review. Regression Model 1 was significant and explained 42% of the variance in lecturers' utilisation of the FODT. The main effect of the lecturers' awareness level of the FODT was significant ($\beta = 0.65, p < .001$), indicating that lecturers with increasing awareness levels in the FODT also reported utilisation of the FODT for literature review (Table 3).

In Model 2, 53% of the variation in the lecturers' utilisation level of the FODT for literature review was accounted for by the lecturers' awareness and knowledge (taken together) of the FODT. The regression equation indicated that each increase in the lecturers' awareness and knowledge levels is associated with about 0.37 and 0.58 increases in the lecturers' utilisation of the FODT, respectively. The regression equation is $Y = 1.17 + 0.37x^1 + 0.58x^2$. The standard errors for the slopes (0.05 and 0.10) are smaller than the standard errors for the intercept (2.44). This shows that the coefficient estimates are precise. Also, the lecturers' level of awareness of the FODT predicted their utilisation of the FODT, $R^2 = 0.42, F(1,141) = 99.86, p < .05, 95\% CI [0.39, .59]$. The lecturers' level of awareness and knowledge (when taken together) of the FODT predicted their utilisation of the FODT, $R^2 = 0.42, F(1,141) = 99.86, p < .05, 95\% CI [0.38, .79]$. Hence there is a significant relationship between lecturers' awareness and knowledge levels of the FODT and their utilisation of these FODT for literature review in education.

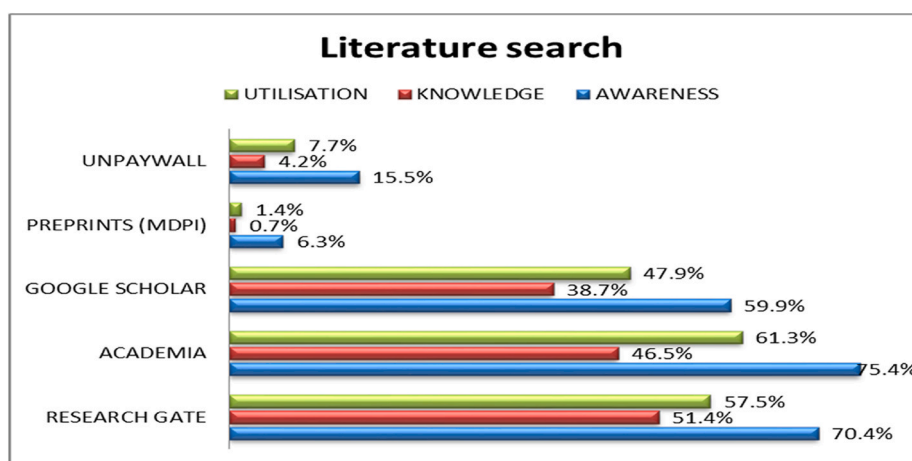


Fig. 2. Academic Staff's Level of awareness, knowledge, and utilisation of the FODT for literature search.

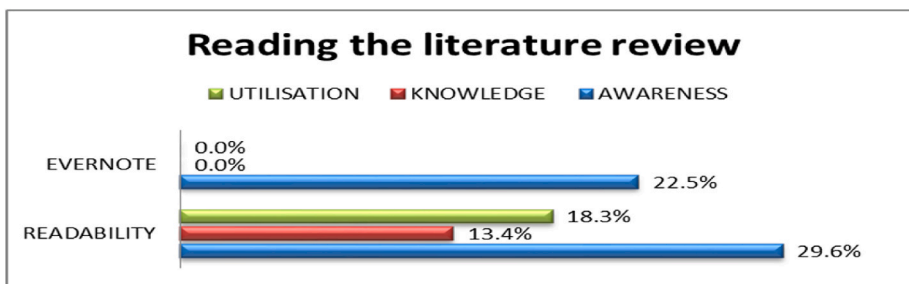


Fig. 3. Academic Staff's Level of awareness, knowledge, and utilisation of the FODT for reading the literature.

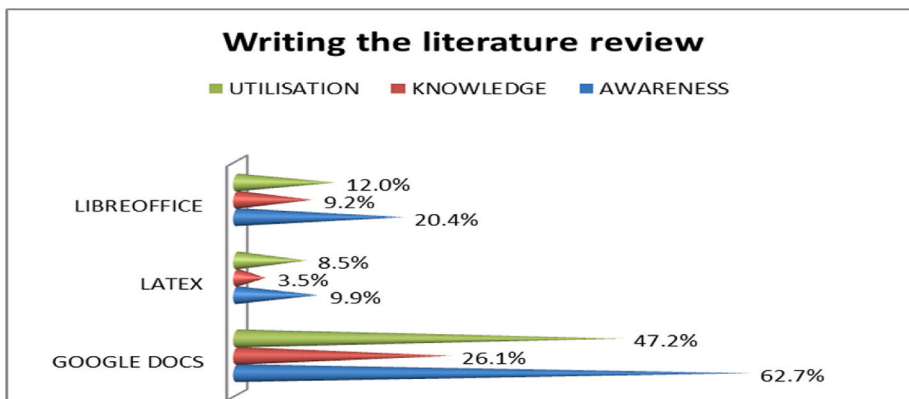


Fig. 4. Academic Staff's Level of awareness, knowledge, and utilisation of the FODT for writing the literature.

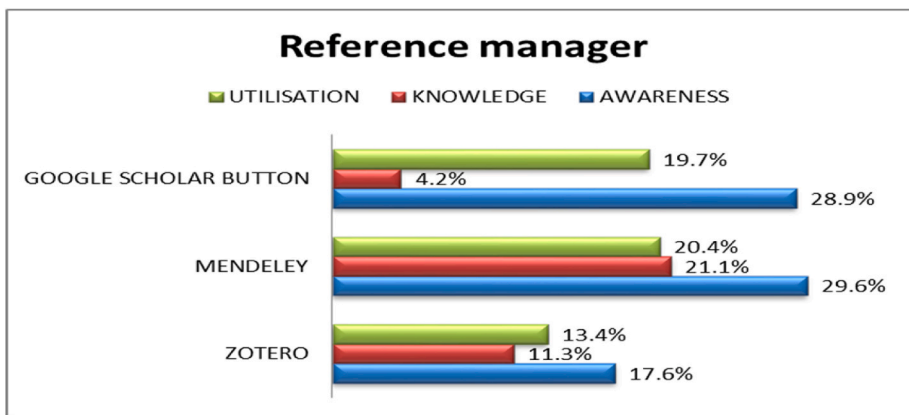


Fig. 5. Academic Staff's Level of awareness, knowledge, and utilisation of the FODT for managing references.

4. Discussion

The study examined academic staff awareness, knowledge, and utilisation level of the free online digital tools available for literature review in education. The study further found the relationship between lecturers' awareness and knowledge levels to their utilisation of the FODT. The study found that the level of awareness, knowledge, and utilisation of lecturers of the free online digital tools available for literature review in education was low. Out of the 23 tools used in the study, it was only in two of the FODTs (Research Gate and Academia) that the lecturers' awareness, knowledge, and utilisation levels were high. These two FODTs were used for the literature search. Academic staff in Nigeria are aware and knowledgeable of what the two digital tools for the literature review are used for, and they also use them. Apart from these two FODTs, their awareness and knowledge of the FODTs for literature review is low. This situation may have contributed to the lecturers' low utilisation of these digital tools. Since, for those FODTs, the lecturers' awareness and knowledge levels were high, their utilisation level also increased. This was the case for Research Gate and Academia.

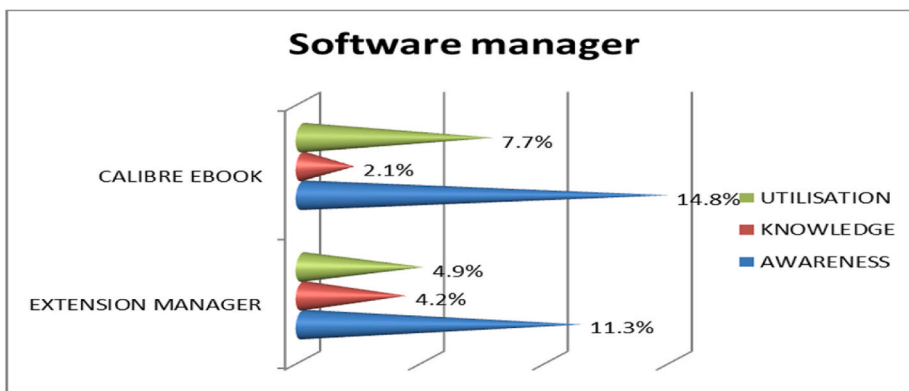


Fig. 6. Academic Staff's Level of awareness, knowledge, and utilisation of the FODT for managing software.

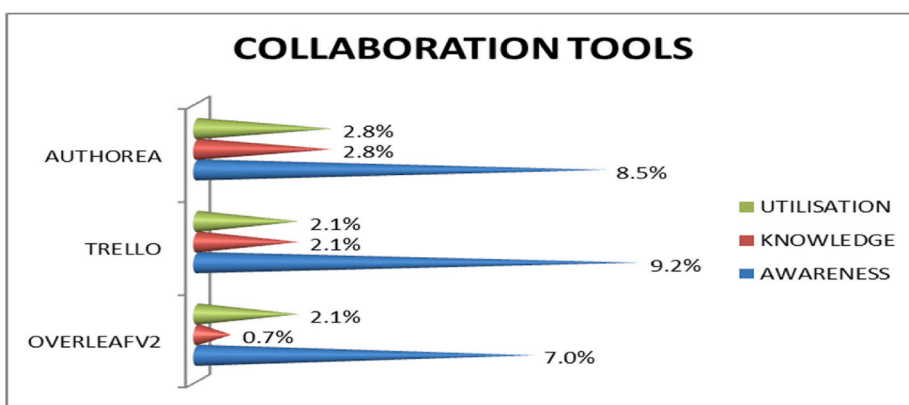


Fig. 7. Academic Staff's Level of awareness, knowledge, and utilisation of the FODT for managing collaboration.

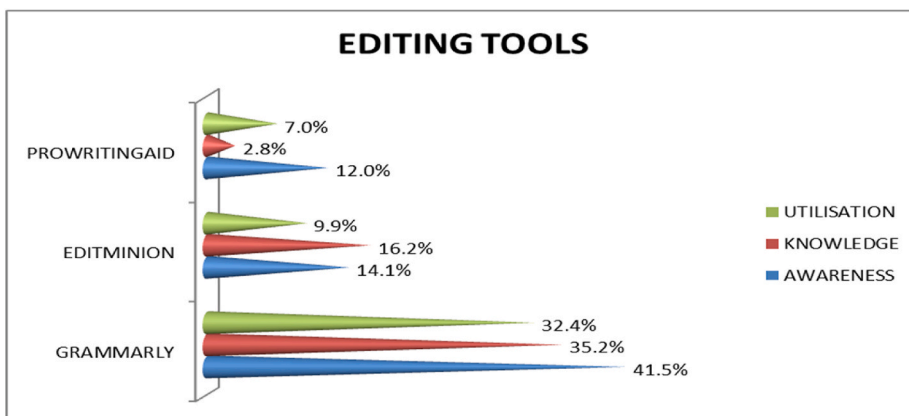


Fig. 8. Academic Staff's Level of awareness, knowledge, and utilisation of the FODT for editing.

These findings were in line with Anushandhan and Maharana [37]; their results showed that more than half of the study respondents were unaware of internet resources and services for research in India. Also, Angello [38] studies in Tanzania discovered that the researchers had little knowledge of online resources. Studies in developing countries on lecturers' use of electronic databases for research found that the lecturer's awareness and knowledge level were high in Nigeria [39,76] and Ghana [77]. However, some studies also found that the awareness and knowledge of researchers were low in Ghana [31,78] and Pakistan [32].

Another study finding shows that lecturers' awareness and knowledge significantly predicted their utilisation of the FODT available for literature review in education. Previous studies have shown a strong relationship between awareness of the availability of online

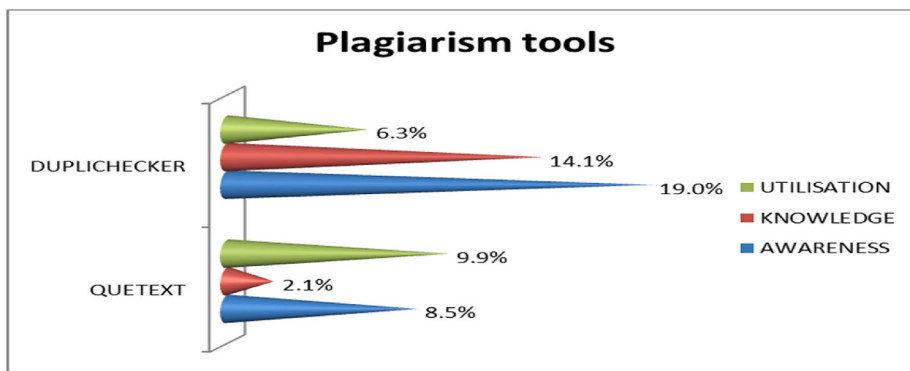


Fig. 9. Academic Staff's Level of awareness, knowledge, and utilisation of the FODT for plagiarism check.

Table 2
Relations between lecturers' awareness, knowledge, and utilisation of FODT.

Variable		Awareness	Knowledge	Utilisation
Awareness	Correlation	1	.45**	.61**
	Sig. (2-tailed)		.00	.00
	N	142	142	142
Knowledge	Correlation	.45	1	.68**
	Sig. (2-tailed)	.00		.00
	N	142	142	142
Utilisation	Correlation	.61**	.68**	1
	Sig.(2-tailed)	.00	.00	
	N	142	142	142

** Correlation is significant at the 0.01 level (2-tailed).

Table 3
Linear Regression of Lecturers' Awareness and Knowledge of FODT predicting their Utilisation of the FODT for Literature Review in Education.

Variable	Model 1			Model 2		
	B	β	SE	B	β	SE
Constant	12.79**		1.45	1.17		
Awareness	.49**	.65	.05	.37**	.48	.05
Knowledge				.58**	.37	.10
R²	.42				.53	

Note: N = 142, **p < .01.

resources/tools with their utilisation in Uganda [34] and Nigeria [35]. It was observed that there was a positive relationship between the lecturers' level of awareness and knowledge of the FODT. Awareness and knowledge aid lecturers in deciding whether to use scholarly resources or not [39,71]. However, these findings did not agree with Ishak and Zabil [79] on the impact of effective consumer behaviour. Their study showed no significant relationship between the level of knowledge and awareness. This disparity in findings may be because both studies focused on different issues. The present study was on online digital tools, while theirs were on food items. The present study has shown that lecturers' awareness of the FODT may likely influence them to acquire knowledge and encourage them to start using the FODT for literature review.

The findings from this study have contributed to the scares knowledge available in this area of study. The results have confirmed the Self-Determination theory (SDT) hypothesis that motivation from awareness and knowledge can promote competence and utilisation of online digital tools. It has also confirmed the Diffusion of Innovation Theory (DOI) that the decision to use innovation is based on personal knowledge about the innovation. In this study, the findings showed that lecturers' awareness and knowledge of the FODTs used for a literature review could influence the utilisation of these tools. These digital tools have helped improve quality research output in developed countries [23–25]. If lecturers' awareness and knowledge of the FODTs are improved, their usage of these FODTs will increase the quality of research output from developing countries.

The study limitations include the sample size used for the study, which was relatively small and limited to Nigeria. However, the results are not necessarily unique to the sample. However, they can be generalised to other academic staff in developing countries with similar characteristics since some previous studies' findings were consistent with the present study. The results of this study can form a base for more discussion on the available free online digital tools used for research.

5. Conclusion

This study identified that the lecturers' awareness, knowledge, and utilisation levels of the FODTs used for literature review in education were low. It was also learnt from this study that lecturers' awareness and knowledge levels were closely related to their utilisation of the FODTs available for literature review in education. These findings demonstrate that awareness and knowledge of the free online digital tools are useful prerequisites to effectively utilising these FODTs. Academic associations and institutions should create awareness of the availability of these FODTs. They should conduct workshops on using these FODTs when writing a literature review. Curriculum planners should include these FODTs in research-related courses. Further research should be carried out on the efficacy of each of these FODTs, and researchers should identify other upcoming FODTs for literature review. Researchers in other developing countries can replicate this study in their respective countries. Their findings will increase the validity of the conclusions of this study.

References

- [1] J.M. Pearce, How to perform a literature review with free and open-source software, *Practical Assess. Res. Eval.* 23 (8) (2018), <https://doi.org/10.7275/jjhz-sz75>.
- [2] J. Webster, R.T. Watson, Analysing the past to prepare for the future: writing a literature review, *MIS Q.* 26 (2) (2002) 13–23, <https://doi.org/10.2307/4132319>.
- [3] American Psychological Association (APA), *Publication Manual of the American Psychological Association*, sixth ed., 2010.
- [4] C.O. Alordiah, T.O. Ikekha, *Introduction to Research Method*, Cee-Emmyikyke, Agbor, 2016.
- [5] Y. Levy, T.J. Ellis, A systems approach to conduct an effective literature review in support of information system research, *Inf. Sci.* 9 (2006).
- [6] D.V. Chen, Y. Wang, W.C. Lee, Challenges confronting beginning researchers in conducting literature reviews, *Stud. Cont. Educ.* (2015), <https://doi.org/10.1080/0158037x.2015.1030335>.
- [7] Z. Shahsavari, H. Kourepaz, Postgraduate students' difficulties in writing their thesis literature review, *Cogent Education* 7 (2020) 1, <https://doi.org/10.1080/2331186x.2020.1784620>.
- [8] P. Cronin, F. Ryan, M. Coughlan, Undertaking a literature review: a step-by-step approach, *Br. J. Nurs.* 17 (1) (2008) 38–43, <https://doi.org/10.12968/bjon.2008.17.1.28059>.
- [9] D. Budgen, P. Brereton, Performing Systematic Literature Reviews in Software Engineering, in: *Proceedings of the 28th International Conference on Software Engineering*, ACM, 2006, pp. 1051–1052, <https://doi.org/10.1145/1134285.1134500>.
- [10] D.W. Lewis, The inevitability of open access, *Coll. Res. Libr.* 73 (5) (2012) 493–506, <https://doi.org/10.5860/crl-299>.
- [11] C.O. Alordiah, H.I. Owamah, E.J.A. Ogbinaka, M.O. Alordiah, Nigerian's low contribution to recognised world research literature: causes and remedies, *Account. Res.* 28 (8) (2021) 471–491, doi.org/10.1080/08989621.2020.1855984.
- [12] D.A. Hernandez, M.M. El-Masri, C.A. Hernandez, Choosing and using citation and bibliographic database software (BDS), *Diabetes Educ.* 34 (3) (2008) 457–474, <https://doi.org/10.1177/0145721708317875>.
- [13] G. Grosseck, R. Bran, Script towards research 2.0: the influence of digital and online tools in academic research, *World J. Educ. Technol.: Curr. Issues* 8 (2) (2016) 132–138, <https://doi.org/10.18844/wjet.v8i2.676>.
- [14] K. Majumder, *A Young Researcher's Guide to Digital Tools for Literature Search and Reference Management*, Editage Insights, 2017.
- [15] R. Pai, R. Ms, Awareness and use of research support tools by researchers of manipal institute of technology, MAHE, manipal: an analytical study, *Libr. Philos. Pract.* (2019), 3615, <https://digitalcommons.unl.edu/libphilprac/3615>.
- [16] O. Renn, J. Dolenc, J. Schnabl, Getting Digital Tools into Students' and Researchers' Workflows, in: *Proceedings of the IATUL Conferences*. Paper 6, 2019, <https://docs.lib.purdue.edu/iatul/2018/infolit/6>.
- [17] U. Gasser, M. Ienca, J. Scheibner, J. Sleigh, E. Vayena, Digital tools against COVID-19: taxonomy, ethical challenges, and navigation aid, *The Lancet Digit. Health* 2 (8) (2020) e425–e434, [https://doi.org/10.1016/S2589-7500\(20\)30137-0](https://doi.org/10.1016/S2589-7500(20)30137-0).
- [18] S. Albrecht, C. Minet, S. Herbst, D. Pscheida, T. Köhler, The Use of Digital Tools in Scholarly Activities. Empirical Findings on the State of Digitization of Science in Germany, Focusing on Saxony, in: *E-Science*, Springer, Cham, 2021, pp. 49–65, https://doi.org/10.1007/978-3-030-66262-2_4.
- [19] M. Hilbert, Digital gender divide or technologically empowered women in developing countries? A typical case of lies, damned lies, and statistics, *Wom. Stud. Int. Forum* 3496 (2011) 479–489, <https://doi.org/10.1016/j.wsif.2011.07.001>.
- [20] B.P.Y. Loo, Y.L. Ngan, Developing mobile telecommunications to narrow digital divide in developing countries? Some lessons from China, *Telecommun. Pol.* 36 (2012) 88–900, <https://doi.org/10.1016/j.telpol.2012.07.015>.
- [21] M.I. Manda, B.D. Dhaou, Responding to the Challenges and Opportunities in the 4th Industrial Revolution in Developing Countries, in: *In the Proceedings of the 12th International Conference on Theory and Practice of Electronic Governance (ICEGOV2019)*, Melbourne, Vic, Australia, April 3-4, 2019, 2019, p. 10, <https://doi.org/10.1145/3326365.3326398>.
- [22] B.P.Y. Loo, *The E-Society*. Nova Science, 2012.
- [23] B. Heterick, Faculty attitudes toward electronic resources, *Educ. Rev.* 37 (4) (2002) 10.
- [24] M.A. Jankowska, Identifying university professors' information needs in the challenging environment of information and communication technologies, *J. Acad. Librarian* 30 (1) (2004) 51–66, <https://doi.org/10.1016/j.jal.2003.11.007>.
- [25] D. Ellis, H. Oldman, The English literature researcher in the age of the internet, *J. Inf. Sci.* 3 (1) (2005) 29–36, <https://doi.org/10.1177/0165551505049256>.
- [26] H. Confraria, M.M. Godinho, The impact of African science: a bibliometric analysis, *Scientometrics* 102 (2015) 1241–1268, <https://doi.org/10.1007/s11192-014-1463-8>.
- [27] N. Cheeseman, C. Death, L. Whitfield, Notes on researching africa, *Afr. Aff.* (2017) 1–5, <https://10.1093/afraf/adx005>.
- [28] K. Foster, R. Heppensta, C. Lazarz, E. Broug, Emerald academy 2008 authorship in Africa emerald. <http://info.emeraldinsight.com/pdf/report.pdf/20.3.14>, 2008.
- [29] D.K. Fiankor, H. Akussah, Information use and policy decision making by district assembly members in Ghana, *Inf. Dev.* 28 (1) (2012) 32–42, <https://doi.org/10.1177/0266666911428286>.
- [30] S.H. Khan, M. Hassan, C.K. Clement, Barriers to the introduction of ICT into education in developing countries: the example of Bangladesh, *Int. J. InStruct.* 5 (2) (2012) 61–80.
- [31] G. Kwadzo, Awareness and Usage of Electronic Databases by Geography and Resource Development Information Studies Graduate Students in the University of Ghana, in: *Library Philosophy and Practice (E-journal)*. Paper 1210, 2015. <http://digitalcommons.unl.edu/libphilprac/1210>.
- [32] N.F. Warraich, M. Tahira, HEC Digital Library: Challenges and Opportunities for LIS Professionals in Pakistan, in: *Library Philosophy and Practice (E-journal)*, 2009, p. 248.
- [33] J. Bohannon, Who's downloading pirated papers? Everyone, *Science* 352 (6285) (2016) 508–512, <https://doi.org/10.1126/science.352/6285.508>.
- [34] A.A. Kiyengyere, The effect of information literacy on the utilisation of electronic information resources in selected academic and research institutions in Uganda, *Electron. Libr.* 25 (3) (2007) 328–334, <https://doi.org/10.1108/02640470710754832>.
- [35] O.B. Oladeji, O. Olagunju, N.T. Meludu, Awareness, knowledge, and utilisation of hypertension management techniques among rural dwellers in Ijebu-North East Local Government Area of Ogun State, Nigeria, *J. Hypertens. Manag.* 6 (2) (2020) 1–11, <https://doi.org/10.23937/2474.3690/1510051>.

- [36] I. Suleiman, D. Joshua, Awareness and utilisation of the internet resources and services for academic activities by the academic staff of tertiary institutions in Adamawa State, Nigeria, *Int. J. Knowl. Content Dev. Technol.* 9 (2) (2019) 7–31, <https://doi.org/10.5865/IJKCT.2019.9.2.00>.
- [37] S.O. Anushandhan, R.K. Maharana, Access, awareness and use of electronic information resources by research scholars of Berhampur University: a study American, *Int. J. Res. Hum., Arts Soc. Sci.* 13 (271) (2013).
- [38] C. Angello, The awareness and use of electronic information sources among livestock researchers in Tanzania, *J. Inf. Literacy* 4 (2) (2010) 6–22, <https://doi.org/10.11645/4.2.697>.
- [39] B. Adetomiwa, Awareness, Knowledge, and Utilisation of Electronic Databases as Predictors of Research Productivity of Academic Staff in Private Universities in Southwestern Nigeria, in: *A Thesis Submitted in Partial Fulfilment of the Requirements for Doctor of Philosophy to Faculty of Education, University of Ibadan, Nigeria, 2020*.
- [40] S. Motala, K. Menon, In search of the 'new normal': reflections on teaching and learning during Covid-19 in a South African university, *South. Afr. Rev. Educ. Educ. Prod.* 26 (1) (2020) 80–99, <https://hdl.handle.net/10520/ejc-sare-v26-n1-a6>.
- [41] K. Zeng, S.N. Bernardo, W.E. Havins, The use of digital tools to mitigate the COVID-19 pandemic: comparative retrospective study of six countries, *JMIR Publ. Health Surveill.* 6 (4) (2020) e24598, <https://doi.org/10.2196/24598>.
- [42] K. Okabe-Miyamoto, E. Durnell, R.T. Howell, M. Zizi, Did zoom bomb? Negative video conferencing meetings during COVID-19 undermined worker subjective productivity, *Hum. Behav. Emerg. Technol.* 3 (5) (2021) 1067–1083, <https://doi.org/10.1002/hbe2.317>.
- [43] S. Sinha, V. Thada, Advances in technology: preparedness for handling pandemic challenges, in: *Enabling Healthcare 4.0 for Pandemics: A Roadmap Using AI, Machine Learning, IoT and Cognitive Technologies, 2021*, pp. 143–161, <https://doi.org/10.1002/9781119769088.ch8>.
- [44] D. Vargo, L. Zhu, B. Benwell, Z. Yan, Digital technology use during COVID-19 pandemic: a rapid review, *Hum. Behav. Emerg. Technol.* 3 (1) (2021) 13–24, <https://doi.org/10.1002/hbe2.242>.
- [45] D. Queen, K. Harding, COVID-19 consequences in the management of persons with wounds, *Int. Wound J.* 19 (2) (2022) 237–238, <https://doi.org/10.1111/iwj.13748>.
- [46] S. Menon, M. Suresh, Enablers of technology agility in higher education, *Int. J. Inf. Learn. Technol.* 39 (2) (2022) 166–196, <https://doi.org/10.1108/IJILT-07-2021-0107>.
- [47] M.S.A. Ariyanto, N. Mukminatien, S. Tresnadewi, Students' and teachers' perceptions towards the implementation of prowritingAid and teacher feedback, *J. Pendidik.: Teori, Penelit., Pengemb.* 4 (10) (2019), <https://doi.org/10.17977/jptpp.v4i10.12843>.
- [48] S.K. Basak, A comparison of researcher's reference management software: RefWorks, Mendeley, and EndNote, *J. Econ. Behav. Stud.* 6 (7) (2014) 561–568, <https://doi.org/10.22610/JEBs.V6i7.517>.
- [49] D.S. Chawla, Unpaywall finds free versions of paywalled papers, *Nature*. (2017), <https://doi.org/10.1038/nature.2017.21765>.
- [50] H. Else, The rise and rise of Unpaywall, *Nature* 560 (2018) 290–291, <https://doi.org/10.1038/d41586-018-05968-3>. Springer Nature.
- [51] A.J. Heather, Trello, *J. Med. Libr. Assoc.* 105 (2) (2017) 209–211, <https://doi.org/10.5195/jmla.2016.49>.
- [52] M. Korzaan, C. Lawrence, Advancing students productivity: an introduction to Evernote, *Inf. Syst. Electron. J.* 14 (2) (2016) 19–26.
- [53] N.R. Motewar, Managing E-books using Calibre software, *J. Adv. Libr. Sci.* 6 (1) (2019) 290s–295s, <https://doi.org/10.37591/joals.v6i1.1774>.
- [54] M.A. Ghufron, F. Rosyida, The role of Grammarly in assessing English as a Foreign Language (EFL) writing, *Lingua Cult.* 12 (4) (2018) 395–403.
- [55] R.J.M. Ventayen, C.C. Orlanda-Ventayen, Graduate students' perspective on the usability of Grammarly® in one ASEAN state university, *Asian ESP J.* 14 (7.2) (2018).
- [56] H.I. Lailika, Students' Perceptions of the Use of Grammarly as an Online Grammar Checker in Thesis Writing, UIN Sunan Ampel Surabaya, 2019. Doctoral dissertation.
- [57] J.S. Barrot, Integrating technology into ESL/EFL writing through grammarly, *RELC J.* (2020), <https://doi.org/10.1177/0033688220966632>.
- [58] G. Halevi, H. Moed, J. Bar-Ilan, Suitability of Google Scholar as a source of scientific information and as a source of data for scientific evaluation—review of the literature, *J. Inf.* 11 (3) (2017) 823–834, <https://doi.org/10.1016/j.joi.2017.06.005>.
- [59] L.R. Zientek, J.M. Werner, M.V. Campuzano, K. Nimon, The use of Google Scholar for research and research dissemination, *New Horiz. Adult Educ. Hum. Resour. Dev.* 30 (1) (2018) 39–46, <https://doi.org/10.1002/nha3.20209>.
- [60] M.D.W. Hooper, Review of unpaywall [chrome & firefox browser extension], *J. Librarianship Sch. Commun.* 5 (1) (2017), <https://doi.org/10.7710/2162-3309.2190>.
- [61] A.D. Sergiadis, Evaluating Zotero, SHERPA/RoMEO, and Unpaywall in an institutional repository workflow, *J. Electron. Resour. Librarian* 31 (3) (2019) 152–176, <https://doi.org/10.1080/1941126X.2019.1635396>.
- [62] H.A. Johnson, Trello, *J. Med. Libr. Assoc.: JMLA* 105 (2) (2017) 209–211, <https://doi.org/10.5195/jmla.2016.49>.
- [63] A. Kaur, App review: Trello, *J. Hosp. Librarian.* 18 (1) (2018) 95–101, <https://doi.org/10.1080/15323269.2018.1400840>.
- [64] A.F. Uebe Mansur, A.C. Alves, R.B. Torres, Trello as virtual learning environment and active learning organiser for PBL classes: an analysis under Bloom's Taxonomy. <https://hdl.handle.net/1822/66659>, 2019.
- [65] R. Adamu, S.M. Dan-Iya, Awareness and utilization of anti-plagiarism detection software among academic staff of Yusuf Maitama Sule university, *Res. J. Libr. Inf. Sci.* 4 (2) (2020) 9–21.
- [66] K. Garg, B. Garg, Technology and tools for easy writing of the medical dissertation and original articles, *Int. J. Acad. Med.* 6 (3) (2020) 215, <https://doi.org/10.4103/IJAM.IJAM.8.20>.
- [67] C.S. Gauld, L.M. Lewis, K.M. White, B.C. Watson, C.T. Rose, J.J. Fleiter, Gender differences in the effectiveness of public education messages aimed at smartphone use among young drivers, *Traffic Inj. Prev.* 21 (2) (2020) 127–132, <https://doi.org/10.1080/15389588.2020.1732948>.
- [68] D.M. Vallone, J.C. Duke, J. Cullen, K.L. McCausland, J.A. Allen, Evaluation of Ex: a national mass media smoking cessation campaign, *Am. J. Publ. Health* 101 (2) (2011) 302–309, <https://doi.org/10.2105/AJPH.2009.190454>.
- [69] A. Wathuge, D. Sadera, An Awareness-Based Model to Minimise the Environmental Damage of the Internet Usage: A Longitudinal Study, in: *Twenty-fifth Pacific Asia Conference on Information System, Dubai, UAE. PACIS 2021 Proceedings*, vol. 130, 2021. <https://aisel.aisnet.org/pacis2021/130>. arXiv preprint arXiv:2111.004453.
- [70] R. Trevehan, Deconstructing and assessing knowledge and awareness in public health research, *Front. Public Health* 5 (2017) 194, <https://doi.org/10.3389/fpubh.2017.00194>.
- [71] E.E. Baro, J.O. Ubogu, Awareness and use of online information resources by medical students at Delta State University in Nigeria, *Libr. Hi Tech News* 28 (10) (2011), 1117, <https://doi.org/10.1108/07419051111202655>.
- [72] F.W. Dulle, M.K. Minishi-Majanja, Researchers' perceptiveness on open access scholarly communication in Tanzanian public universities, *SA J. Inf. Manag.* 11 (4) (2009), <https://doi.org/10.4102/sajim.v11i4.413>.
- [73] A. Fullard, South African responses to open access publishing: a survey of the research community, *S. Afr. J. Libr. Inf. Sci.* 73 (1) (2013), <https://doi.org/10.7553/73-1-1333>.
- [74] Y.M. Yusoff, Z. Muhammad, E.S. Pasah, E. Robert, Individual differences, perceived ease of use, perceived usefulness in the e-library usage, *Comput. Inf. Sci.* 2 (1) (2009) 76–83, <https://doi.org/10.5539/cis.v2n1p76>.
- [75] C. Koo, N. Chung, Examining the Eco-Technological knowledge of smart green IT adoption behaviour: a self-determination perspective, *Technol. Forecast. Soc. Change* 88 (2014) 140–155, <https://doi.org/10.1016/j.techfore.2014.06.025>.
- [76] U.M. Hamza, A. Aliyu, B.Y. Maryam, H. Abbas, Use of electronic databases by the academics of faculty of sciences umaru Musa Yaradua university, Katsina, Nigeria, *J. Hum. Sci.* 20 (50) (2015) 51–56, <https://doi.org/10.9790/0837-20545156>.

- [77] P.N.Y. Kwafoa, I. Osman, P. Afful-Arthur, Assessment of the Use of Electronic Resources Among Administrators and Faculty in the University of Cape Coast, in: Library Philosophy and Practice (E-journal). Paper 1094, 2014. <http://digitalcommons.un.edu/libphilprac/1094>.
- [78] P.S. Dadzie, Electronic resources: access and usage at ashesi university college, Campus-Wide Inf. Syst. 22 (5) (2005) 290–297, <https://doi.org/10.1108/10650740510632208>.
- [79] S. Ishak, N.F.M. Zabil, Impact of consumer awareness and knowledge to consumer effective behaviour, Asian Soc. Sci. 8 (13) (2012) 108–114, <https://doi.org/10.5539/ass.v8n13p108>.