Awareness, Knowledge, and Utilisation of Online Digital Tools for Literature Review in Educational Research

Caroline Ochuko.**Alordiah**[1] (PhD), Mercy Afe. **Osagiede**[2] (Ph.D.),Florence Chiedu. **Omumu**[3] (Ph.D.), Isabella Ezinwa. **Okokoyo**[4] (Ph.D.), Helena Tsaninomi. **Emiko-Agbajor**[5] (Ph.D.), O. **Chenube**[6] (Ph.D.), John. **Oji**[7] (PhD),

[3,6]Department of Arts and Social Sciences Education, University of Delta, Agbor, Delta State, Nigeria
[1,2,4,7]Department of Science Education, University of Delta, Agbor, Delta State, Nigeria
[5]College of Education Warri, Delta State, Nigeria
[1]Corresponding author e-mail: caroline.alordiah@unidel.edu.ng; carolinealordiah@gmail.com
[1]Corresponding phone number: +2348035504867

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 relationship between 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 correlation. 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. There was a significant relationship between lecturers' awareness, knowledge, and utilisation of the FODT available for literature review in education at a .05 level of significance. These results demonstrate that awareness and knowledge of the FODT are useful prerequisites to effective utilisation. It was recommended that stakeholders in research and education create awareness of the availability of these FODT, carry out workshops on how to use them and replicate this study in other developing countries.

Keywords:

Free online digital tools (FODT), Awareness of FODT, Knowledge of FODT, Utilisation of FODT, Literature review, Educational research.

Introduction

It appears that Nigerian researchers are not using the 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 the Nigerian 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 involved 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 (Pearce, 2018; Webster & Watson, 2002). A literature review is a stand-alone piece that examines the relationship between current and earlier discoveries on the same subject (American Psychological Association [APA], 2010). It is an exercise where the researcher identifies, locates, reads, and evaluates prior studies, views, and comments relevant to the study that the investigator is about to conduct (Alordiah & Ikekhua, 2016). 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 (Levy & Ellis, 2006; Pearce, 2018).

Literature reviews have an important role in influencing educational policy and practice, future research and public perception of educational issues (Chen, Wang, & Lee, 2015). 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 (Alordiah & Ikekhua, 2016; Shahsavar & Kourepaz, 2020). Furthermore, a literature review educates researchers about important scholars and research organisations and defines the researcher's study aim (Alordiah & Ikekhua, 2016; Pearce, 2018).

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 (Cronin, Ryan & Coughlan, 2008). 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 getting access to 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 (Budgen & Brereton, 2006; Pearce, 2018). Copyright limitations and subscription fees have unexpected effects limiting access to peer-reviewed material and negatively impacting effective literature reviews (Lawis, 2012). 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 (Alordiah, Owamah, Ogbinaka, & Alordiah, 2020). 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 (Hernandez, El-Masri, & Hernandez, 2008). Vocabulary, sentence structure, grammatical accuracy, connectors, and transitional phrases are difficult for non-native English speakers (Chen, Wang, & Lee, 2015). It might be challenging to do a literature review with other researchers who do not live in one's region. As a result of these difficulties, many literature reviews in developing countries are of poor quality.

Today, using 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 (Grosseck & Bran, 2016). 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 (Majumder, 2017). 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 (Grosseck & Bran, 2016). 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 of them may be downloaded.

There is a digital gap in ICTs, internet access, and internet usage between developed and developing countries (Hilbert, 2011; Loo & Ngan, 2012; Manda & Dhanu, 2019). The digital gap in ICT encompasses the availability of e-technology and other factors such as accessibility, cost, dependability, speed, awareness, knowledge, and application (Loo, 2012). 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 (Heterick, 2002), Russia (Jankowska, 2004), and the United Kingdom (Ellis & Oldman, 2005). The number of research publications from developing nations published in high-ranking journals is still low (Alordiah et al., 2021; Confrana & Godinho, 2015). There is a considerable productivity disparity between researchers in the global north and developing nations (Cheeseman et al., 2017). 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 (Foster et al., 2008; Fiankor & Akussah, 2012; Alordiah et al., 2021). Various studies reveal that ICT and digital technologies in higher education in several developing nations are still low (Khan et al., 2012; Kwadzo, 2015; Wairrach & Tahira, 2009).

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. 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, Plagramme, Unicheck, 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 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 (Ariyanto, Mukminatien & Tresnadewi, 2019; Basak, 2014; Chawla, 2017; Else, 2018; Heather, 2017; Korzaan& Lawrence, 2016; Motewar, 2019).

Some of these ODTs are free, while others cost money. A free and a premium (paid) version are available for some of them. 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 also 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. 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.

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 uses 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.

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.

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 (Bohannon, 2016). There is a need for a legal and simple way for all researchers to obtain unlimited access to literature (Pearce, 2018). 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 (Kiyengyere, 2007; Oladeji, Olagunju & Meludu, 2020). 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).

Consciousness has a significant role in defining awareness. Consciousness refers to a person's overall capability for a specific type of subjective experience. A circumstance in which someone is made aware of something is known as awareness. It is the act of becoming conscious of something's existence. People's ability to recognise something exists is awareness (Adetomiwa, 2020). Awareness is the capacity to be conscious of a new trend, such as new technology or system. Problems or repercussions can be recognised, as can tools or technology, as well as government, organisation, or community-specific norms and regulations (Wathuge & Sedera, 2021). The idea of awareness in this study refers to if the academic staff in African tertiary institutions have heard about free online digital tools for doing literature reviews in education. Awareness leads to knowledge, which leads to a shift in attitudes, which influences behavioural intention and usage (Gundu & Flowerday, 2013). Previous research has shown that raising awareness can help people change their behaviour (Gauld et al., 2020; Vallone et al., 2011; Wathuge & Sedera, 2021).

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 (Adetomiwu, 2020). Experience, values, information, and understanding of anything are all part of knowledge. Knowledge is built on awareness, yet awareness should not be confused with knowledge. Perceiving and consciousness of the presence of events, objects, ideas, attitudes, or sensory patterns is referred to as awareness. Knowledge is known as facts, information, and abilities acquired via experience or study. The main distinction between

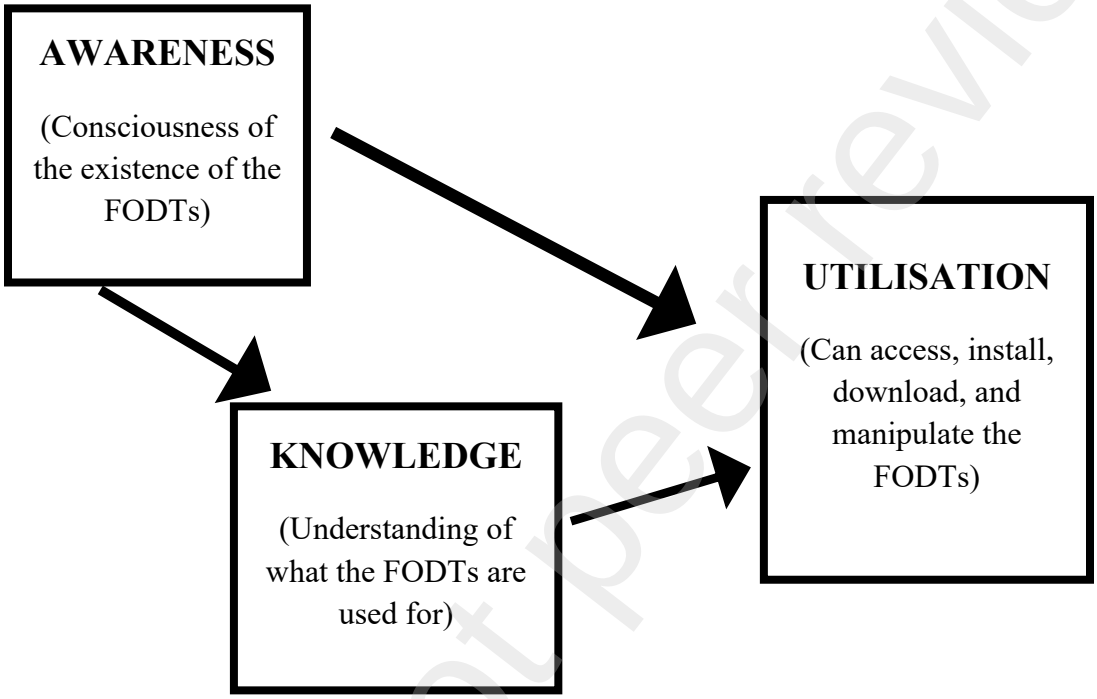
awareness and knowledge is that knowledge implies a thorough comprehension and acquaintance with a subject or technique, whereas awareness does not. It appears that awareness and knowledge are inextricably linked. There is some knowledge in both circumstances. While awareness is a broad understanding 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 (Trevethan, 2017). According to this study, if academics in developing nations have not heard of the FODT, they are unaware of it. They are aware of the FODT if they have heard of it. Furthermore, if the researchers do not know what these FODTs are utilised for, they are ignorant. 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 (Adetomiwa, 2020). The capacity of a researcher to learn to use obtained information on the FODTs is the idea of usage. Use involves accessing, installing, downloading, copying, and manipulating the FODTs. It also refers to academics' or researchers' capacity to accept and adopt technology to attain a certain objective or purpose (Omotayo, 2010). The importance of awareness and knowledge in deciding scholarly communications in higher education has been recognised (Adetomiwa, 2020; Baro et al., 2011; Dulle & Minishi-Majanga, 2009; Fullard, 2013; Yusoff et al., 2009). In general, a person's knowledge of digital technology can impact how they use it. Knowledge about a digital tool can affect how it is used. Also, knowledge might act as a go-between awareness and the actual use of a digital instrument. The acquisition of information about a digital tool can be influenced by awareness of the device, which might impact the tool's use. Figure 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 FODs can also be seen as a mediating variable between awareness and utilisation of the FODTs.

Figure 1

Relationships between awareness, knowledge, and utilisation



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 (Koo & Chung, 2014). 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 (Adetomiwa, 2020).

Grosseck and Bran (2016) investigated the impact of digital and online technologies on academic research. They took a look 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 (2019) 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 simply aware of the e-mail. According to a survey conducted in India, 48.5% of participants were aware of internet resources and services (Anushandhan & Maharana, 2013). In another study, livestock researchers in Tanzania had little knowledge of online resources (Angello, 2010). Also, Adetomiwa (2020) 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 focuses 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.

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. After that, The researchers randomly selected 30 academic staff members from the faculty/school of education in each of the six states. It came to a total of 180 academics staff. 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.

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 made 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, researchers in education, and computer science experts. Also, the reliability of the instrument was done using Cronbach's alpha. It yielded .86, .76, and .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, and 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. 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 minutes to complete. The respondents' demographic data were summarised using a frequency count and a percentage estimate. While frequency count, percentage, mean and standard deviation were used to answer the study questions. At the 0.05 level of significance, Pearson product-moment correlation was used to evaluate the hypotheses.

Results

Academic Staff Level of Awareness on the Free Online Digital Tools Available for Literature Review in Educational Research

Table 2

Academic staff level of awareness, knowledge and utilisation of the free online digital tools for literature review

FREE ONLINE DIGITAL TOOLS	AWARENESS					KNOWLEDGE					UTILISATION				
LITERATURE SEARCH	**Yes**	**Sum**	**Mean**	**SD**	**%**	**Yes**	**Sum**	**Mean**	**SD**	**%**	**Yes**	**Sum**	**Mean**	**SD**	**%**
Research Gate	100	242			70.4	73	215			51.4	82	224			57.7
Academia	107	249			75.4	66	208			46.5	87	229			61.3
Google Scholar	85	227			59.9	55	197			38.7	68	210			47.9
Preprints (MDPI)	9	151			6.3	1	143			0.7	2	144			1.4
Unpaywall	22	164			15.5	6	148			4.2	11	153			7.7
Mean		1033	1.46	.27			911	1.28	.24			960	1.35	.27	
READING THE LITERATURE REVIEW															
Readability	42	184			29.6	19	161			13.4	26	168			18.3
Evernote	32	174			22.5	0	142			0	0	142			0
Mean		358	1.26	.36			303	1.07	.17			310	1.09	.27	
WRITING THE LITERATURE REVIEW															
Google Docs	89	231			62.7	37	179			26.1	67	209			47.2
LaTex	14	156			9.9	5	147			3.5	12	154			8.5
LibreOffice	29	171			20.4	13	155			9.2	17	159			12.0
Mean		558	1.31	.29			481	1.13	.21			522	1.23	.26	
REFERENCE MANAGER															
Zotero	25	167			17.6	16	158			11.3	19	161			13.4
Mendeley	42	184			29.6	30	172			21.1	29	171			20.4
Google Scholar Button	41	183			28.9	6	148			4.2	28	170			19.7
Mean		534	1.25	.32			478	1.12	.22			502	1.18	.39	
SOFTWARE MANAGER															
Extension manager	16	158			11.3	6	148			4.2	7	149			4.9
Calibre eBook	21	163			14.8	3	145			2.1	11	153			7.7
Mean		321	1.13	.30			293	1.03	.14			302	1.06	.21	
COLLABORATION TOOL															
Overleafv2	10	152			7.0	1	143			0.7	3	145			2.1
Trello	13	155			9.2	3	145			2.1	3	145			2.1
Authorea	12	154			8.5	4	146			2.8	4	146			2.8
Mean		461	1.08	.23			434	1.02	.10			436	1.02	.12	
EDITING TOOLS															
Grammarly	59	201			41.5	50	192			35.2	46	188			32.4
EditMinion	20	162			14.1	23	165			16.2	14	156			9.9
ProwritingAid	17	159			12.0	4	146			2.8	10	152			7.0
Mean		522	1.23	.28			503	1.18	.25			496	1.16	.24	
PLAGIARISM TOOLS															
Quetext	12	154			8.5	3	145			2.1	9	151			9.9
Duplichecker	27	169			19.0	20	162			14.1	14	156			6.3
Mean		323	1.14	.29			307	1.08	.21			307	1.08	.23	
Grand Mean			1.23	.22				1.14	.11				1.17	.17	

The awareness of the lecturers on the plagiarism test FODTs ranges from 8.5% to 19%. The awareness of lecturers of the FODTs used for literature search, writing the literature review, reference management, collaboration literature review, reading the literature review, software/apps manager, and editing ranges from 6.3% - 75.4%, 9.9% - 62.7%, 17.6% - 29.6%, 7.0% - 9.2%, 22.5% - 29.6%, 11.3% - 14.8%, and 12.0% - 41.2% respectively. Only research gate, academia, Google scholar (literature search), and google docs (writing the literature review) were above 50%. It follows that the awareness level of the lecturers on these four FODTs was high. All the other ones were low. The mean awareness level for the lecturers for the FODTs for literature search (1.46), reading the literature review (1.26), writing the literature review (1.31), reference manager (1.25), software manager (1.13), collaboration literature review (1.08), editing (1.23), and plagiarism (1.23) were all below 1.50. It implies that the lecturers' awareness level of these FODTs was low. (see table 2)

Academic Staff's knowledge of Free Online Digital Tools for Conducting Literature Reviews in Educational Research

The knowledge of the lecturers ranges from 2.1% - 14.1%, 0.7% - 51.4%, 3.5% - 26.1%, 4.2% - 21.1%, 0.7% - 2.8%, 0% - 13.4%, 2.1% - 4.2%, and 2.8% - 35.2% for the FODTs for plagiarism test, literature search, writing the literature review, reference manager, collaboration literature review, reading the literature, software/apps manager, and editing respectively. Only the research gate was above 50%. Hence, the knowledge level of the lecturers for the research gate is above average. The mean knowledge level for all the listed FODTs ranges from 1.02 to

1.28. The means were less than 1.50, which implies that the knowledge level of the lecturers on the 23 FODTs was below average. (see table 2)

Academic Staff's Utilisation of Free Online Digital Tools for Conducting Literature Reviews in Educational Research

From table 2, the utilisation level of the lecturers ranges from 6.3% - 9.9%, 1.4% - 61.3%, 8.5% - 47.2%, 13.4% - 20.4%, 2.1% - 2.8%, 0% - 18.3%, 4.9% - 7.7%, and 7.0% - 32.4% for the FODTs for plagiarism test, literature search, writing the literature review, reference manager, collaboration literature review, reading the literature review, software/apps manager, and editing respectively. Only research gate and academia levels of utilisation were above 50%. Hence, the utilisation level of the lecturers for the two FODTs was above average. The mean utilisation level for the 23 FODTs ranges from 1.02 to 1.35. It implies that the utilisation level of the lecturers on the FODTs was below average.

Relationship Between Lecturers' Awareness and Knowledge of FODT to their Utilisation of the FODT for Literature Review in Education

Table 3

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).

The correlation analysis in table 3 shows a significant strong relationship between lecturers' awareness of the FODT and their utilisation (r=.61. p=0.00). Also, there was a significant strong relationship between the lecturer's knowledge and utilisation of the FODT (r=.68, p=0.00). It shows that lecturers' awareness and knowledge are important for effectively utilising the FODT by the lecturers. 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. It implies that as the lecturers' awareness level of the FODTs increases, their utilisation level of the FODTs also increases. Also, as the lecturers' knowledge of the FODTs increases, their utilisation of them increases.

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 was also

increased. This was the case for Research Gate and Academia. These findings were in line with Anushandhan and Maharanu (2013); their results showed that more than half of the respondents in the study were not aware of internet resources and services for research in India. Also, Angello (2010) 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 was high in Nigeria (Adetomiwa, 2020; Hamza et al., 2015) and Ghana (Kwafoa et al., 2014). However, some studies also found that awareness and knowledge of researchers were low in Ghana (Dadzie, 2005; Kwadzo, 2015) and Pakistan (Wairrach & Tahira, 2009).

Another finding in this study shows a significant positive relationship between lecturers' awareness and knowledge and 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 resources/tools with their utilisation in Uganda (Kiyengyere, 2007) and Nigeria (Oladeji, Olagunju &Meludu, 2020). 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 (Adetomiwa, 2020; Baro et al., 2011). However, these findings did not agree with Ishak and Zabil, 2012) 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 their's 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 (Ellis & Oldman, 2005; Heterick, 2004; Jankowska, 2004). 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 of the 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.

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 FODT 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

Adetomiwa, B. (2020). *Awareness, knowledge, and utilisation of electronic databases as predictors of research productivity of academic staff in private universities in southwestern Nigeria.* A thesis submitted in partial fulfilment of the requirements for Doctor of Philosophy to Faculty of Education, University of Ibadan, Nigeria.

Alordiah, C. O., & Ikekhia, T. O. (2016). *Introduction to research method*. Agbor: Cee-Emmyikye

Alordiah, C. O., Owamah, H. I., Ogbinaka, E. J. A., & Alordiah, M. O. (2021). Nigerian's low contribution to recognised world research literature: Causes and remedies. *Accountability in Research, 28*(8), 471-491. https:doi.org/10.1080/08989621.2020.1855984

American Psychological Association (APA). (2010). *Publication manual of the American Psychological Association* (6th ed.).

Angello, C. (2010). The awareness and use of electronic information sources among livestock researchers in Tanzania. *Journal of Information Literacy*, 4(2), 6-22. https://doi.org/10.11645/4.2.697

Anushandhan, S. O., Maharana, R. K. (2013). Access, awareness and use of electronic information resources by research scholars of Berhampur University: A study American *International Journal of Research in Humanities, Arts and Social Sciences, 13*(271).

Ariyanto, M. S. A., Mukminatien, N., & Tresnadewi, S. (2019). Students' and teachers' perceptions towards the implementation of prowritingAid and teacher feedback. *Journal Pendidikan: Teori, Penelitian, &Pengembangan, 4*(10), https://doi.org/10.17977/jptpp.v4i10.12843

Baro, E. E., & Ubogu, J. O. (2011). Awareness and use of online information resources by medical students at Delta State University in Nigeria. *Library Hi Tech News, 28*(10), 1117. https://doi.org/10.1108/07419051111202655

Basak, S. K. (2014). A comparison of researcher's reference management software: RefWorks, Mendeley, and EndNote. *Journal of Economics and Behavioural Studies, 6*(7), 561-568. https://doi.org/10.22610/JEBs.V617.517

Bohannon, J. (2016). Who's downloading pirated papers? Everyone. *Science, 352*(6285), 508-512. https://doi.org/10.1126/science.352/.6285.508

Budgen, D., & Brereton, P. (2006). *Performing systematic literature reviews in software engineering*. In Proceedings of the 28th international conference on software engineering (pp. 1051-1052). ACM. https://doi.org/10.1145/1134285.1134500

Chawla, D. S. (2017, April 4). Unpaywall finds free versions of paywalled papers. *Nature.* https://doi.org/10.1038/nature.2017.21765

Chen, D. V., Wang, Y., & Lee, W. C. (2015). Challenges confronting beginning researchers in conducting literature reviews. *Studies in Continuing Education*. https://doi.org/10.1080/0158037x.2015.1030335

Cheeseman, N., Death, C., & Whitfield, L. (2017). Notes on researching Africa. *African Affairs*, 1-5. https://10.1093/afraf/adx005

Confraria, H., & Godinho, M. M. (2015). The impact of African science: A bibliometric analysis. Scientometrics, 102, 1241-1268. https://doi.org/10.1007/s11192-014-1463-8

Cronin, P., Ryan, F., & Coughlan, M. (2008). Undertaking a literature review: a step-by-step approach. *British Journal of Nursing, 17*(1), 38-43. https://doi.org/10.12968/bjon.2008.17.1.28059

Dadzie, P. S. (2005). Electronic resources: access and usage at Ashesi University College. *Campus-Wide Information System, 22*(5), 290-297. https://doi.org/10.1108/10650740510632208

Dulle, F. W., & Minishi-Majanja, M. K. (2009). Researchers' perceptive on open access scholarly communication in Tanzanian public universities. SA Journal of Information Management, 11(4). https://doi.org/10.4102/sajim.v11i4.413

Ellis, D., & Oldman, H. (2005). The English literature researcher in the age of the internet. *Journal of Information Science, 3*(1), 29-36. https://doi.org/10.1177/0165551505049256

Else, H. (2018). The rise and rise of Unpaywall. *Nature, 560*, 290-291. Springer Nature. https://doi.org/10.1034/d41586-018-05968-3

Foster, K., Heppensta, R., Lazarz, C., & Broug, E. (2008). Emerald academy 2008 authorship in Africa emerald. http://info.emeraldinsight.com/pdf/report.pdf/.20.3.14

Fiankor, D. K., & Akussah, H. (2012). Information use and policy decision making by district assembly members in Ghana. *Information Development, 28*(1), 32-42. https://doi.org/10.1177/0266666911428286

Fullard, A. (2013). South African responses to open access publishing: A survey of the research community. *South African Journal of Library & Information Science*, *73*(1). https://doi.org/10.7553/73-1-1333

Gauld, C. S., Lewis, L. M., White, K. M., Watson, B. C., Rose, C. T., & Fleiter, J. J. (2020). Gender differences in the effectiveness of public education messages aimed at smartphone use among young drivers. *Traffic Injury Prevention, 21*(2), 127-132. https://doi.org/10.1080/15389588.2020.1732948

Grosseck, G., & Bran, R. (2016). Script towards research 2.0: The influence of digital and online tools in academic research. *World Journal on Educational Technology: Current Issues, 8*(2), 132-138. https://doi.org/10.18844/wjet.v8i2.676

Gundu, T., & Flowerday, S. (2013). Ignorance to awareness: Towards an information security awareness process. *SAIEE Africa Research Journal, 104*(2), 69-79. https://doi.org/10.23919/SAIEE.2013.8531867

Hamza, U. M., Aliyu, A., Maryam, B. Y., & Abbas, H. (2015). Use of electronic databases by the academics of faculty of sciences Umaru Musa Yaradua University, Katsina, Nigeria. *Journal of Humanities and Science, 20*.50, 51-56. https://doi.org/10.9790/0837-20545156

Heather, A. J. (2017). Trello. *Journal of the Medical Library Association, 105*(2), 209-211. https://doi.org/10.5195/jmla.2016.49

Hernandez, D. A., El-Masri, M. M., & Hernandez, C. A. (2008). Choosing and using citation and bibliographic database software (BDS). *Diabetes Educator, 34*(3), 457-474. https://doi.org/10.1177/0145721708317875

Heterick, B. (2002). Faculty attitudes toward electronic resources. *Educause Review*, 37(4), 10.

Hilbert, M. (2011). Digital gender divide or technologically empowered women in developing countries? A typical case of lies, demned lies, and statistics. Women's Studies International Forum, 3496), 479-489. https://doi.org/10.1016/j.wsif.2011.07.001

Ishak, S., & Zabil, N. F. M. (2012). Impact of consumer awareness and knowledge to consumer effective behaviour. *Asian Social Science, 8*(13), 108-114. https://doi.org/10.5539/ass.v8n13p108

Jankowska, M. A. (2004). Identifying university professors' information needs in the challenging environment of information and communication technologies. *The Journal of Academic Librarianship, 30*(1), 51-66. https://doi.org/10.1016/j.jal.2003.11.007

Khan, S. H., Hassan, M., Clement, C. K. (2012). Barriers to the introduction of ICT into education in developing countries: The example of Bangladesh. *International Journal of Instruction, 5*(2), 61-80.

Kiyengyere, A. A. (2007). The effect of information literacy on the utilisation of electronic information resources in selected academic and research institutions in Uganda. *Electronic and Library The, 25*(3), 328-334. https://doi.org?10.1108/02640470710754832

Koo, C., & Chung, N. (2014). Examining the Eco-Technological knowledge of smart green IT adoption behaviour: A self-determination perspective. *Technological Forecasting and Social Change, 88*, 140-155. https://doi.org/10.1016/j.techfore.2014.06.025

Korzaan, M., & Lawrence, C. (2016). Advancing students productivity: An introduction to Evernote. *Information System Education Journal, 14*(2), 19-26.

Kwadzo, G. (2015). Awareness and usage of electronic databases by geography and resource development information studies graduate students in the University of Ghana. Library *Philosophy and Practice (e-journal).* Paper 1210. http://digitalcommons.un/.edu/libphilprac/1210

Kwafoa, P. N. Y., Osman, I., & Afful-Arthur, P. (2014). Assessment of the use of electronic resources among administrators and faculty in the University of Cape Coast. Library *Philosophy and Practice (e-journal).* Paper 1094. http://digitalcommons.un/.edu/libphilprac/1094

Lewis, D. W. (2012). The inevitability of open access. *College & Research Libraries, 73(*5), 493-506. https://doi.org/10.5860/cri-299

Levy, Y., & Ellis, T. J. (2006). A systems approach to conduct an effective literature review in support of information system research. *Informing Science, 9*.

Loo, B. P. Y. (2012). *The e-society*. Nova Science.

Loo, B. P. Y., & Ngan, Y. L. (2012). Developing mobile telecommunications to narrow digital divide in developing countries? Some lessons from China. *Telecommunications Policy, 36*, 88-900. https://doi.org/10.1016/j.telpol.2012.07.015

Majumder, K. (2017). *A young researcher's guide to digital tools for literature search and reference management*. Editage Insights.

Manda, M. I., & Dhaou, B. D. (2019). *Responding to the challenges and opportunities in the 4th industrial revelation in developing countries*. In the proceedings of the 12th international conference on Theory and practice of electronic governance (ICEGOV2019), Melbourne, Vic, Australia, April 3-4, 2019, 10 pages. https://doi.org/10.1145/3326365.3326398

Motewar, N. R. (2019). Managing E-books using Calibre software. *Journal of Advancements in Library Sciences, 6*(1), 290s-295s. https://doi.org/10.37591/joals.v6i1.1774

Oladeji, O. B., Olagunju, O., & Meludu, N. T. (2020). Awareness, knowledge, and utilisation of hypertension management techniques among rural dwellers in Ijebu-North East Local Government Area of Ogun State, Nigeria. *Journal of Hypertension and Management, 6*(2), 1-11. https://doi.org/10.23937/2474.3690/1510051

Omotayo, B. O. (2010). Access, use and attitudes of academics towards electronic journals: A case study of Obafemi Awolowo University, Ile-Ife. *Library Philosophy and Practice (e-journal)*. 335

Pearce, J. M. (2018). How to perform a literature review with free and open-source software. *Practical Assessment, Research, and Evaluation, 23*(8). https://doi.org/10.7275/jjhz-sz75

Shahsavar, Z., &Kourepaz, H. (2020). Postgraduate students' difficulties in writing their thesis literature review. *Cogent Education, 7*:1.https://doi.org/10.1080/2331186x.2020.1784620

Suleiman, I., & Joshua, D. (2019). Awareness and utilisation of the internet resources and services for academic activities by the academic staff of tertiary institutions in Adamawa State, Nigeria. *International Journal of Knowledge Content Development & Technology, 9*(2), 7-31. https://doi.org/10.5865/IJKCT.2019.9.2.00

Trevethan, R. (2017). Deconstructing and assessing knowledge and awareness in public health research. *Frontiers in Public Health, 5*:194. https://doi.org/10.3389/pubh.2017.00194

Vallone, D. M., Duke, J. C., Cullen, J., McCausland, K. L., & Allen, J. A. (2011). Evaluation of Ex: A national mass media smoking cessation campaign. American Journal of Public Health, 101(2), 302-309. https://doi.org/10.2105/AJPH.2009.190454

Warraich, N. F., & Tahira, M. (2009). HEC digital library: Challenges and opportunities for LIS professionals in Pakistan. *Library Philosophy and Practice (e-journal)*. 248

Wathuge, A., & Sedera, D. (2021). An awareness-based model to minimise the environmental damage of the internet usage: A longitudinal study. Twenty-fifth Pacific Asia conference on information system, Dubai, UAE. PACIS 2021 proceedings. 130. https://aisel.aisnet.org/pacis2021/130. arXiv preprint arXiv.2111.004453

Webster, J., & Watson, R. T. (2002). Analysing the past to prepare for the future: Writing a literature review. *MIS Quarterly*, 26(2), 13-23. https://doi.org/10.2307/4132319

Yusoff, Y. M., Muhammad, Z., Pasah, E. S., & Robert, E. (2009). Individual differences, perceived ease of use, perceived usefulness in the e-library usage. *Computer and Information Science, 2*(1), 76-83. https://doi.org/10.5539/cis.v2n1p76