International Journal of Doctoral Studies

An Official Publication of the Informing Science Institute
InformingScience.org

IJDS.org

Volume 17, 2022

INFORMATION LITERACY, RESEARCH SELF-EFFICACY, AND RESEARCH PRODUCTIVITY OF DOCTORAL STUDENTS IN UNIVERSITIES IN OGUN STATE, NIGERIA

Paul Adesola Adekunle *	Bowen University, Iwo, Nigeria	adesola.adekunle@bowen.edu.ng
Ezinwanyi Madukoma	Babcock University, Ilishan-Remo, Nigeria	madukomae@babcock.edu.ng

* Corresponding author

ABSTRACT

Aim/Purpose	The main purpose of the study was to find out the influence of information literacy and research self-efficacy on the research productivity of doctoral students in universities in Ogun State, Nigeria.
Background	The prosperity of any nation is inextricably tied to its research productivity in both quality and quantity. Hence, doctoral education, among others, is meant to sustain research productivity by training students that will possibly assume the role of researchers in the future. However, despite the importance of research productivity to the prosperity of a nation and the sustenance of scholarship, evidence from the literature has shown that doctoral students globally and in the study's locale do experience low research productivity, manifested as low publication count, underdeveloped strategies for thesis writing, and unusually prolonged doctoral education. This study, therefore, examined the influence of information literacy and research self-efficacy on research productivity of doctoral students in universities in Ogun State, Nigeria.
Methodology	The study used a survey research design. The population of the study was 1,418 doctoral students from six universities in Ogun State already undertaking doctoral programs out of nine licensed by the National Universities Commission (NUC). The Research Advisor's table was used to select a sample size of 306. A structured and validated questionnaire was used for data collection. Cronbach's alpha reliability coefficient for the constructs ranged from 0.72 to 0.98. The response rate was 92%. Data were analyzed using descriptive and inferential (simple and multiple regression) statistics.

Accepting Editor Nick J Sciullo | Received: May 24, 2022 | Revised: September 10, October 7, 2022 | Accepted: October 11, 2022.
Cite as: Adekunle, P. A., & Madukoma, E. (2022). Information literacy, research self-efficacy, and research productivity of doctoral students in universities in Ogun State, Nigeria. *International Journal of Doctoral Studies, 17,* [479-511. https://doi.org/10.28945/5030

Contribution	To the best of the researcher's knowledge, this is the only study that has combined information literacy with research self-efficacy as predictors of doctoral students' research productivity. Therefore, it has added to the existing literature on information literacy, research self-efficacy, and research productivity by shedding light on the influence of information literacy and research self-efficacy on research productivity.
Findings	The findings of this paper are the following. 1. Research productivity of doctoral students in universities in Ogun State, Nigeria was low as majority of the respondents scored below the criterion mean in all the measured items. 2. This low research productivity was notable in publication count, presentations at conferences and thesis writing, leading to unusually prolonged doctoral education for most of the respondents. 3. The study showed that doctoral students in universities in Ogun State, Nigeria possessed a high level of information literacy. 4. There was a positive and significant relationship between information literacy and research productivity (R^2= 0.076, F(1,282) = 4.582, p <0.05) of doctoral students in universities in Ogun State, Nigeria. 5. There was a positive and significant relationship between research self-efficacy and research productivity (R^2= 0.060, $F_{(1, 282)}$ = 17.218, p<0.05) of doctoral students in universities in Ogun State, Nigeria. 6. Findings revealed that the level of research self-efficacy of doctoral students in universities in Ogun State, Nigeria was high
Recommendations for Practitioners	Faculty should ensure that every doctoral student have access to a faculty advisor or mentor who is approachable and accessible. This will provide doctoral students with a roadmap for practice and constructive feedback. By strengthening doctoral students-faculty relationships, more opportunities arise for aspiring researchers to learn the general practices and procedures for conducting and designing studies, collecting, and analyzing data, and writing a well-organized manuscript.
Recommendations for Researchers	The resultant model could be adopted by researchers to undergird related studies. Moreover, subsequent research can build on the findings of the empirical study to broaden the scope of research productivity of scholars
Impact on Society	The study has accentuated the primacy of research and its continued production to the growth and development of every stratum of the nation. Consequently, it has become incumbent for the government and other stakeholders to promote its continued productivity by creating an enabling environment for doctoral students in Nigeria.
Future Research	To further broaden this area of research, the following are suggested for further studies. Qualitative/focus group investigation of information literacy, research self-efficacy and research productivity of doctoral students. This may reveal more in-depth data not captured in the current study.

The study can also be replicated in other states of the nation and other parts of the world as research productivity and its predictors cut across nations.

Further studies can investigate other combinations of research productivity predictors.

Keywords information literacy, information processing, self-efficacy, research self-efficacy, research productivity, doctoral studies

INTRODUCTION

This paper is the second article reporting on the results of the same study. The first paper (Madukoma & Adekunle, 2022) focused on critical thinking and research productivity; this paper focuses on research self-efficacy and research productivity.

Information is the foundation upon which all academic activities are built. The quality of teaching, learning. and research is a function of the quality of information available to scholars. As noted by Sehoole (2011), doctoral education is the core of university research capacity and the source of research productivity and innovation in the global knowledge economy. Sehoole further stated that doctoral education is expected to produce new and original ideas and knowledge through research productivity. Meanwhile, writing and publishing research results are crucial for progressing scientific thought and reaching a broad audience (Derntl, 2014). In carrying out these activities, doctoral students have to sift out information from varied sources such as the Internet, electronic resources, libraries, and other sources in unfiltered form. Because research is accretive and builds on information, doctoral students need to be equipped with information literacy knowledge. Information literacy is described as the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning (Association of College and Research Libraries [ACRL], 2016, p. 8)

The relationship between research productivity and information literacy has been examined in a number of studies, mostly from Nigeria. Few of these studies measured the impact of information literacy on research productivity (Afolabi & Oladokun, 2020; Anekwe, 2018; Igun & Odafe, 2014; Madu & Dike, 2012; Nwosu et al., 2015; Okiki, 2013). Fewer still from Nigeria examined the impact of information literacy on research productivity but ended up dwelling more on information literacy while glossing over research productivity (Oyedokun et al., 2019; Oyewo & Uwem, 2016). In addition, most of these studies drew their respondents from the academic staff, with none focusing distinctly on the impact of information literacy on research productivity of doctoral students in Nigeria.

Apart from information literacy, research self-efficacy is another factor that may affect the research productivity of doctoral students as research has been established to be challenging and requires strong psychological and emotional conditions for sustainability (Jiang et al., 2019; Ulibarri et al., 2014). Following Bandura's (2006) social cognitive theory, self-efficacy is described as an individual's belief about what he or she can achieve in a given context. Apart from having a direct effect on research productivity, self-efficacy can also mediate with other factors, such as information literacy, to influence research productivity (Hemmings & Kay, 2015). Because self-efficacy is task-specific, research self-efficacy, then, would be the belief in one's ability to engage successfully in different components of the research process. In the same vein, research self-efficacy can be referred to as the degree to which students are confident in performing different research tasks (Westhuizen, 2014). Moreover, research self-efficacy can manifest as general research self-efficacy where an individual is self-efficacious in all aspects of the research process or as quantitative and qualitative research self-efficacy, where an individual's research self-efficacy is limited to either the quantitative or qualitative aspect of research design. However, research self-efficacy is dynamic and can be influenced by a number of factors, which include research training environment, mentoring, course experiences, and supervision of students (Chesnut et al., 2015). Furthermore, the relationship between research self-

efficacy and research productivity has been studied in a variety of settings and found to be a predictor of graduate students' research interest and productivity and scholarly productivity among university faculty (Hemmings & Kay, 2015; Pasupathy & Siwatu, 2014). Other studies on research productivity and research self-efficacy include (Ajegbomogun & Popoola, 2014; Boswell, 2014; Chesnut et al., 2015; Dan et al., 2018; Hemmings & Kay, 2015; Lambie et al., 2014; Liu et al., 2019; Pasupathy & Siwatu, 2014). However, most of these studies focused on faculty staff. In addition, most of the studies focused on finding the sources of research self-efficacy rather than its impact on research productivity. More importantly, only one of these studies emanated from Africa (Ajegbomogun & Popoola, 2014).

Moreover, the prosperity of any nation is inextricably tied to its research productivity, measured in quality and quantity. Overtime, universities have been recognized as centers for the continued initiation, conduct, and dissemination of research and its findings. Research, especially in its applied form, is meant to respond to the needs of society and thus advance the growth of a nation. Seeing in this light, it can be said that the current state of any nation is a reflection of its research productivity in quality and quantity. In other words, barely can any society grow beyond the quality and quantity of its research production. Arguably therefore, research can be said to make the difference between the developed and the developing nations of the world. This justifies the renewed and heightened attention being paid to research productivity and the various stakeholders involved in the process. Following the study of Simisaye and Popoola (2019), research productivity is described as the total number of journal articles, textbooks, monographs, conference proceedings, technical reports, chapters in books, theses, dissertations, scientific peer reviews, co-authored textbooks, occasional papers and patents produced by scholars within a specified timeframe. However, when viewed as the process of grooming future researchers, Niehaus et al. (2018) defined researcher development as the process whereby students' capacity and willingness to carry out the research components of their work or studies may be considered enhanced.

Because research and its continued production determine a nation's development and survival, it brings to light the issue of sustainability in order to keep the engine of research running. As success without a successor is short-lived, so is the sustainability of research productivity without an adequate plan to mentor and train the next generation of researchers that will possibly take over because all categories of academics will eventually bow out of the system at a point. Through doctoral education, universities across the world have put in place a process of training, mentoring, and initiating successive generations into the research culture, especially at the doctoral level. Moreover, doctoral training programs are designed to prepare students to take on the rigors of research (Niehaus et al., 2018).

However, despite the importance of research productivity to the growth and development of a nation in general and the sustainability of scholarship in particular, studies have established that doctoral students often encounter low research productivity manifesting in high attrition rate, unusually prolonged doctoral education, stagnation, frustration, and underdeveloped strategies for thesis writing, leading to academic roadblocks and even suicide (Chesnut et al., 2015; Niehaus et al., 2018; Obaseki & Agu, 2019; Pelemo et al., 2020; Poh et al., 2019; Rooij et al., 2019; Sevim & Sarikaya, 2020; Ulibarri et al., 2014).

From Southern Africa, Iwara (2019) reported low research publication output among doctoral students where less than five out of 32 have published a research article in a year. In the same vein, Hepworth and Duvigneau (2012) indicated that samples of postgraduate students from Zambia, Malawi and Botswana displayed low research productivity because of a lack of critical thinking and information literacy. In Nigeria, studies like Oyedokun et al. (2019) and Pelemo et al. (2020), as well as Obaseki and Agu (2019), have established low research productivity of doctoral students.

Against this background, this study examined the influence of information literacy and research self-efficacy the research productivity of doctoral students in universities in Ogun State, Nigeria.

OBJECTIVE OF THE STUDY

The study investigated the influence of information literacy and research self-efficacy on the research productivity of doctoral students in universities in Ogun State, Nigeria. It also did the following:

1. ascertained the level of information literacy of doctoral students in universities in Ogun State,
2. found out how doctoral students in universities in Ogun State acquire their information literacy,
3. determined the level of research self-efficacy of doctoral students in universities in Ogun State,
4. examined the level of research productivity of doctoral students in universities in Ogun State.

RESEARCH QUESTIONS

The study was guided by the following research questions:

1. What is the level of information literacy proficiency of doctoral students in universities in Ogun State, Nigeria?
2. How do doctoral students in universities in Ogun State, Nigeria acquire their information literacy?
3. What is the research self-efficacy level of doctoral students in universities in Ogun State?
4. What is the level of research productivity of doctoral students at universities in Ogun State, Nigeria?

HYPOTHESES

The following null hypothesis tested at 0.05 level of significance guided the study:

$H_0$1: Information literacy will not significantly influence research productivity of doctoral students in universities in Ogun State.

$H_0$2: Research self-efficacy will not significantly influence research productivity of doctoral students in universities in Ogun State

$H_0$3: Information literacy and research self-efficacy will not jointly influence research productivity of doctoral students in universities in Ogun State.

LITERATURE REVIEW

RESEARCH PRODUCTIVITY

For a long time, researchers have been interested in the research productivity of scholars and factors that are likely to enhance it. For example, Bland et al. (2005) described and grouped the factors affecting research productivity into three as individual, institutional, and administrative. In another study, Hemmings and Kay (2010a, 2010b) examined the factors that influence lecturers' research productivity in Australia; Hemmings et al. (2012) conducted a transnational study of lecturers' self-efficacy as a determinant of their research productivity; Hemmings and Kay (2015) examined the relationship between research self-efficacy, research disposition, and publication output of researchers; Heng et al. (2020) examined factors that influence academics' research engagement and productivity from a developing nation's perspective. Similarly, Sevim and Sarikaya (2020) carried out a needs assessment study on doctoral students' research productivity; Lambie and Vaccaro (2011) investigated doctoral counselor education students' levels of research self-efficacy, perceptions of the research training environment and interest in research; Pasupathy and Siwatu (2014) also investigated the research self-efficacy beliefs and research productivity of faculty members at an emerging research

university in the USA; Overall et al. (2011) sought to promote doctoral students' research self-efficacy through a combination of academic guidance and autonomy support; Alhija and Majdob (2018) studied predictors of teacher educators' research productivity.

Furthermore, Lambie et al.,(2014) conducted an exploratory investigation of the research self-efficacy, interest in research, and research knowledge of Ph.D. in education students; Nygaard (2015) investigated the force of publishing and perishing as determinants of research productivity using the framework of academic literacies; Jiang et al. (2019) examined the influence of self-efficacy and research capacity of clinical nurses in China; Rooij et al. (2019) examined the importance of Ph.D. project characteristics as factors that influence doctoral candidates' success; Reyes-Cruz and Perales-Escudero (2016) investigated research self-efficacy sources and research motivation in a foreign language university faculty in Mexico; Alrahlah (2016) conducted a qualitative study on the impact of motivational factors on the research productivity of dental faculty members; Han and Schuurmans-Stekhoven (2016) conducted a pilot study drawing samples from selected international students with the aim of improving higher degree candidates' (HDR) research; Anekstein and Vereen (2018) studied the effect of research mentoring on doctoral students' experiences and research productivity; and Callaghan (2016) investigated the impact of family life on academic research productivity. While these and other studies have identified a number of disparate factors that enhance the research productivity of scholars at various levels, none of these studies, to the best of the authors' knowledge, has examined the influence of information literacy and research self-efficacy on research productivity of doctoral students.

The current study, which assessed the influence of information literacy and research self-efficacy on the research productivity of doctoral students in universities in Ogun State, Nigeria, conducted a review of extant literature relevant to the variables. Due to the indispensability of research and its productivity to the prosperity of nations, the review shows a heightened interest among scholars from various nations and disciplines in research productivity. Examination of the literature indicates that there are numerous factors which have potential effects on the level of research engagement and productivity of academics. The review also shows that the majority of studies on this topic have been carried out mainly in western nations.

Research Productivity and Information Literacy

There was little available literature on research productivity and information literacy, the majority of which is from Nigeria. These include Afolabi and Oladokun, 2020; Anekwe, 2018; Igun and Odafe, 2014; Madu and Dike, 2012; Nwosu et al., 2015; Okiki, 2013; Omeluzor et al., 2013; Oyedokun, et al., 2019, as well as Oyewo and Uwem, 2016. In the same vein, Pelemo et al. (2020) measured the impact of information literacy and library orientation on research productivity of postgraduate students, while Udem and Anaehobi (2020) did a correlational analysis of information literacy and research self-efficacy of Library and Information Science students. In addition, most of these studies drew their respondents from the academic staff, with none focusing distinctly on the impact of information literacy on the research productivity of doctoral students in Nigeria. Furthermore, from the University of Grenada, Spain, Pinto and Fernández-Pascual (2016, 2017a, 2017b) focused on assessing the information literacy competence of undergraduate students in Spain, while Banik and Kumar (2019) examined the impact of information literacy on students' academic performance in Bangladesh.

Research Productivity and Research Self-Efficacy

For research self-efficacy and research productivity, an appraisal of the literature shows a considerable number of studies for research self-efficacy and research productivity. (Ajegbomogun & Popoola, 2014; Baltes et al., 2010; Boswell, 2013, 2014; Chesnut et al., 2015; Dan et al., 2018; Hemmings & Kay, 2015; Lambie et al., 2014; Liu et al., 2019; Obaseki & Agu, 2019; Pasupathy & Siwatu, 2014).

RESEARCH DESIGN

The study adopted the survey research design using questionnaire as the main instrument to generate data from respondents.

POPULATION OF THE STUDY

The target population of this study consisted of 1,418 doctoral students from universities in Ogun State, Nigeria accredited by the National Universities Commission (NUC) to offer doctoral degrees. These are Federal University of Agriculture, Abeokuta; Tai Solarin University of Education, Ijagun, Ijebu-Ode; Olabisi Onabanjo University, Ago Iwoye; Babcock University, Ilishan-Remo; Mountain Top University, Mowe and Covenant University, Ota.

SAMPLE SIZE AND SAMPLING TECHNIQUE

As shown in Table 1, a simple random probability and proportional sampling techniques were used to select sample from the population. Specifically, the sample size was drawn from the total number of students enrolled for doctoral studies at the aforementioned universities. The Research Advisors (2006) published a table was thereafter used to select the sample size for the study. The table at confidence level 95% with margin error of +5.0 was used to select sample size of 306 out of the total population of 1,418 doctoral students for this study. Following the determination of the sample size, proportional random sampling was used to select the required sample size from each of the universities. This is achieved by dividing the derived sample size by the total population of doctoral students. (306÷1,418) in all the universities and multiplied by the target population in each of the universities. However, for Mountain Top University with only two doctoral students, total enumeration was used to include the two students.

Table 1: Sample Size of Doctoral Students at Selected Universities in Ogun State

S/N	Name of University	Population of Doctoral Students	Determined Sample of Doctoral Students
1	Babcock University, Ilishan-Remo	306÷ 1,418 ×**300**	64.7=64
2	Covenant University, Ota	306÷ 1,418 ×**211**	45.5=45
3	Federal University of Agriculture,	306÷ 1,418 ×**170**	36.7=36
4	Mountain Top University, Mowe	306÷ 1,418 ×**2**	0.4=2
5	Olabisi Onabanjo University, Ago Iwoye	306÷ 1,418 ×**719**	155.2=155
6	Tai Solarin University of Education	306÷ 1,418 ×**16**	3.5=4
	Total	**1,418**	**306**

Source: Fieldwork by the Authors

RESEARCH INSTRUMENT

Part of the research questionnaire used for this study titled "**Information Literacy, Research Self-Efficacy and Research Productivity Questionnaire**" (as shown in the Appendix) was adopted with permission from previous studies (Chesnut et al., 2015; Hemmings & Kay, 2015; Pasupathy & Siwatu, 2014). The questionnaire was divided into the following five sections: Section A captured the demographic data of respondents. Section B was self-constructed and designed to measure the research productivity of respondents by indicating the number of times listed research products were produced before doctoral enrolment and in the course of the program. In addition, respondents were required to indicate departmental assessment of their seminar, pre-field, and post-field presentations. Section C assessed the degree of information literacy proficiency of respondents. It was further divided into 4 subscales to measure the degree of respondents' knowledge of information search, information evaluation, information processing and information communication and dissemination.

Section D aimed to know how respondents acquire their information literacy. Section E measured the degree of research self-efficacy of respondents from research ideation to research completion.

Reliability of Instrument

As shown in Table 2, a pilot study was conducted to assess the extent to which the instrument correctly measured the intended variables prior to the real study and sieve out inherent errors. 40 copies of the questionnaire were administered to doctoral students at Bowen University, Iwo, and Osun State, out of which 30 copies were retrieved and found useful for the analysis. Meanwhile, Bowen University, where the pilot study was conducted, was not included in the actual study but was selected because the respondents share similar characteristics with the actual study population. Completed copies of the research questionnaire were subjected to Cronbach's Alpha reliability test and results obtained were used as estimates of the internal consistency of the instrument.

Table 2: Reliability of Instrument

S/N	Variable	No of Items	Cronbach's alpha coefficient
1	Information Literacy	27	0.92
2	Research Self-Efficacy	32	0.90
3	Research Productivity	17	0.76

Method of Data Collection

Data were collected from respondents through the designed questionnaire administered by the researcher and trained assistants. While the distribution and collection of the questionnaire was initially projected to take a month as the selected universities were spread across diverse geographical terrains in Ogun State, Nigeria, it eventually took more than two months as most of the respondents had to be reached online because they were no longer coming to school in compliance with the COVID-19 preventive protocols.

Data Analysis

Data were collected and analyzed using the Statistical Package for Social Science (SPSS) version 20.0 for Windows, which included descriptive analysis involving mean, standard deviation, frequency count, percentages, and percentages. Inferential statistical analysis, such as ANOVA, was also applied to determine the influence of the independent variables on the dependent variable.

Ethical Consideration

Ethical consideration has become an important issue for researchers globally. Therefore, the approval of participating universities regarding ethical compliance of study instrument and other considerations was obtained before the field study. Furthermore, participants were informed of what the whole study was about based on which their informed consent was sought and obtained. To achieve this, a short introduction detailing the objective of the study and the assurance of anonymity was attached to the questionnaire. Besides, respondents were guaranteed of the confidentiality of their identity and data provided in the study. In addition, respondents were informed of their prerogative to withdraw at any point from the study so as not to feel compelled whatsoever. Moreover, respondents were informed of the potential benefits of the findings of the study, which would be made available to them on completion of the study.

RESULTS AND DISCUSSION OF FINDINGS

DEMOGRAPHIC DATA

Although 306 participants were originally targeted for the study, only 284 copies of questionnaire were retrieved and found useful for the analysis representing 92% response rate which was considered adequate for the study. Out of the six selected participating universities, Olabisi Onabanjo University had the highest number of participants numbering 143 (50.4%), followed by Babcock University with 58 (20.4%) respondents. Mountain Top University had the least with just two (0.7%) respondents. The data showed that of the total 284 respondents who participated in the study, 180 (63.4%) were male while 104 (36.6%) constituted female respondents. Moreover, majority of the respondents 139 (48.9%) were within the age bracket of 31–40 years. In addition, 111 (33%) of the respondents had spent 2-3 years on the doctoral program, while 122 (43%) of the respondents had spent between 4–14 years on the program. On the status of the program, 42 (14.8%), 86 (30.3), 96 (33.8%) and 60 (21.1%) were on course work, pre-field, post-field, and viva, respectively. On the issue of gender distribution, the result indicates that more males than females were enrolling in doctoral programs. Looking at the number of years already spent on the program, the result seemed to confirm the unusually prolonged period of doctoral training, which might have given room to stagnation and frustration, thus precipitating low research productivity among doctoral students in universities in Ogun State. However, looking at the age bracket, majority of the respondents (48.9%) fell within the age bracket of 31–40. This is an indication that despite the challenges associated with doctoral education, younger students were still attracted to the program and might actually have started early so they could finish before advancing in age.

RESEARCH QUESTION 1

WHAT IS THE LEVEL OF INFORMATION LITERACY PROFICIENCY OF DOCTORAL STUDENTS IN UNIVERSITIES IN OGUN STATE?

As shown in Table 3, with an overall weighted mean ($\bar{x}$=4.1) higher than the criterion mean ($\bar{x}$=3), the information literacy level of doctoral students in universities in Ogun State is adjudged high. A closer look at the results also revealed that in all the subconstructs, doctoral students still scored high. For information search subconstruct with the highest mean (($\bar{x}$=4.37), an item-by-item analysis showed that respondents finding electronic sources of information (Library OPACs, e-databases, e-journals, etc.) recorded the highest mean ($\bar{x}$=4.37). Others are finding printed sources of information (books, papers, etc.) ($\bar{x}$=4.35), knowing information-search strategies (descriptors, Boolean operators, etc.) ($\bar{x}$=4.33), and searching for and retrieving internet information (advanced searches, directories) ($\bar{x}$=3.94). The implication is that doctoral students in universities in Ogun State considered themselves proficient at finding information from different sources, which is the bedrock of research and its productivity. However, using informal electronic sources of information (blogs, social media, wikis, listservs) recorded the lowest mean ($\bar{x}$=3.70) under information search items. This might just be a pointer to the fact that respondents were not aware of the importance of these alternative sources of information to boost their research productivity. For instance, for scholars to increase the impact factor of their publications, such publications must be visible on these informal electronic sources of information.

Table 3: Information literacy level of doctoral students in universities in Ogun State

S/N	Information Literacy Items	NP=1	BP=2	MP=3	P=4	HP=5	Mean	SD
Information Search ($\bar{x}$=4.1, SD=0.86)								
1	Find electronic sources of information (Library OPACs, e-databases, e-journals, etc.)	0	5 (1.8%)	35 (12.3%)	94 (33.1%)	150 (52.8%)	4.37	.766
2	Find printed sources of information (books, papers, etc.)	0	5 (1.8%)	31 (10.9%)	108 (38.0%)	140 (49.3%)	4.35	.744
3	Know information-search strategies (descriptors, Boolean operators, etc.)	0	2 (.7%)	31 (10.9%)	123 (43.3%)	128 (45.1%)	4.33	.695
4	Search for and retrieve internet information (advanced searches, directories)	6 (2.1%)	19 (6.7%)	63 (22.2%)	95 (33.5%)	101 (35.6%)	3.94	1.017
5	Use informal electronic sources of information (blogs, social media, wikis, listservs	13 (4.6%)	20 (7.0%)	82 (28.9%)	92 (32.4%)	77 (27.1%)	3.70	1.082
Information Evaluation ($\bar{x}$=4.2, SD=0.75)								
6	Assess the quality of information resources	1 (.4%)	1 (.4%)	23 (8.1%)	142 (50.0%)	117 (41.2%)	4.31	.665
7	Recognize the author's ideas within the text	1 (.4%)	4 (1.4%)	45 (15.8%)	134 (47.2%)	100 (35.2%)	4.15	.759
10	Know the most relevant authors and institutions within your subject area	1 . (.4%)	3 (1.1%)	44 (15.5%)	140 (49.3%)	96 (33.8%)	4.15	.739
8	Know the typology of scientific information sources (thesis, proceedings, etc.)	0	12 (4.2%)	43 (15.1%)	136 (47.9%)	93 (32.7%)	4.09	.801
9	Determine whether an information resource is updated	1 (.4%)	7 (2.5%)	52 (18.3%)	133 (46.8%)	91 (32.0%)	4.08	.794
Information Processing ($\bar{x}$=3.9, SD=0.876)								
14	Use bibliographic reference managers (Endnote, Reference Manager, etc.)	1 (.4%)	2 (0.7%)	18 (0.3%)	114 (40.1%)	149 (52.5%)	4.44	0.677
11	Systematically arrange and abstract information	1 (.4%)	7 (2.5%)	51 (18.0%)	146 (51.4%)	79 (27.8%)	4.04	.767
13	Use database managers (Access, MySQL, etc.)	10 (3.5%)	27 (9.5%)	66 (23.2%)	122 (43.0%)	59 (20.8%)	3.68	1.019

12	Recognize text structure	16 (5.6%)	41 (14.4%)	93 (32.7%)	101 (35.6%)	33 (11.6%)	3.33	1.041
Information Communication and Dissemination ($\bar{x}$=4.2, SD=0.688)								
17	Know the laws on the use of information and intellectual property	1 (.4%)	13 (4.6%)	110 (38.7%)	160 (56.3%)	0	4.51	0.621
15	Communicate in public	0	4 (1.4%)	12 (4.2%)	131 (46.1%)	137 (48.2%)	4.41	0.642
16	Know the code of ethics in your academic/professional field	1 (.4%)	2 (.7%)	27 (9.5%)	134 (47.2%)	120 (42.3%)	4.30	0.698
18	Create academic presentations (PowerPoint, etc.)	6 (2.1%)	12 (4.2%)	50 (17.6%)	119 (41.9%)	97 (34.2%)	4.02	0.938
19	Disseminate information on the internet (webs, blogs, etc.)	2 (0.7%)	4 (1.4%)	80 (28.2%)	198 (69.7%)	0	3.67	0.541
Overall Weighted Mean							**4.1**	
Criterion Mean							**3**	

NP (Not Proficient)=1; **BP** (Barely Proficient)=2; **MP** (Moderately Proficient)=3; **P (**Proficient)=4 and **HP** (Highly Proficient)=5

Under the information evaluation subconstruct with a weighted mean of ($\bar{x}$=4.2), assessing the quality of information resources recorded the highest mean ($\bar{x}$=4.31) while recognizing the author's ideas within the text and knowing the most relevant authors and institutions within your subject area followed with ($\bar{x}$=4.15) each. Items bordering on determining whether an information resource is updated recorded the lowest mean ($\bar{x}$=4.8). In this age of information overload with its concomitant tendency for misinformation, scholars not only require information search skills but, more importantly, information evaluation skills that will enable them to sift through the whole mass of available information. Results as shown in this table clearly indicate that doctoral students in universities in Ogun State were able to differentiate facts from fiction when it comes to information authentication. Further analysis of the results revealed that under the information processing subscale with a weighted mean of $\bar{x}$=3.9, item on the use of bibliographic reference managers (Endnote, Reference Manager, etc.) scored the highest mean ($\bar{x}$=4.44) followed by items on systematically arranging and abstracting information ($\bar{x}$=4.04), using database managers (Access, MySQL, etc.) ($\bar{x}$=3.68) while the item on recognizing text structure recorded the lowest mean ($\bar{x}$=3.33). Because research builds on information, the ability to process information meaningfully is a basic requirement for researchers, especially in this information-driven age. As shown in the results, while it is apparent that doctoral students in universities in Ogun State scored high in information processing with a weighted mean of $\bar{x}$=3.9 which is still higher than the criterion mean ($\bar{x}$=3), it revealed some form of weaknesses among the respondents in their abilities to execute those information processing items.

Pertaining to information communication and dissemination subconstructs, doctoral students in universities in Ogun State scored high, as indicated in the results. Taking a closer look at the items under it, results revealed that knowing the laws on the use of information and intellectual property scored the highest mean ($\bar{x}$=4.51), closely followed by communicating in public ($\bar{x}$=4.41), knowing the code of ethics in your academic/professional field ($\bar{x}$=4.300), and creating academic presentations

(PowerPoint, etc.) ($\bar{x}$=4.02). The item pertaining to the dissemination of information on the internet (webs, blogs, etc.) recorded the lowest mean ($\bar{x}$=3.67). It could be inferred from these analyses that doctoral students in universities in Ogun State recognized the sanctity of intellectual property rights and the related issue of plagiarism, could communicate well in public, and were aware of ethical consideration in the conduct of research. However, it could be gleaned from the result that they were not so proficient at creating academic presentations and disseminating information on the internet. These deficiencies, one way or the other, would have affected their research productivity.

RESEARCH QUESTION 2

HOW DO DOCTORAL STUDENTS IN UNIVERSITIES IN OGUN STATE ACQUIRE THEIR INFORMATION LITERACY?

As seen in Table 4, in response to the research question bordering on how they acquire their information literacy, an information literacy course recorded the highest mean ($\bar{x}$=3.08). Coming on its heels was info literacy workshops/seminars ($\bar{x}$=2.98). Others were library orientation ($\bar{x}$=2.87), closely followed by assistance from colleagues ($\bar{x}$=2.86), online tutorials ($\bar{x}$=2.48), faculty/departmental training ($\bar{x}$=2.46), and one-on-one consultation with librarians ($\bar{x}$=2.45), while self-help recorded the lowest mean ($\bar{x}$=2.31). From indications, it seems doctoral students in universities in Ogun State acquired their information literacy through regular course experience. This underscores the need for sustaining existing information literacy programs across schools and constant review of information literacy curriculum to reflect the rapidly changing information landscape. Moreover, it might just confirm the belief that most students are adept at using ICTs but are not necessarily information literate.

Table 4: Information Literacy Acquisition Methods of Doctoral Students in Universities in Ogun State

	Item	SD	D	A	SA	Mean ($\bar{x}$)	SD
	Information literacy course	14 (4.9%)	30 (10.6%)	158 (55.6%)	82 (28.9%)	3.08	.766
	Info literacy workshops/seminars	25 (8.8%)	49 (17.3%)	116 (40.8%)	94 (33.1%)	2.98	.926
	Library orientation	39 (13.7%)	39 (13.7%)	127 (44.7%)	79 (27.8%)	2.87	.975
	Assistance from colleagues	28 (9.9%)	51 (18.0%)	138 (48.6%)	67 (23.6%)	2.86	.890
	Online Tutorials	69 (24.3%)	64 (22.5%)	97 (34.2%)	54 (19.0%)	2.48	1.058
	Training offered by my faculty/department	71 (25.0%)	64 (22.5%)	97 (34.2%)	52 (18.3%)	2.46	1.06
	One on one consultation with librarians	60 (21.1%)	73 (25.7%)	114 (40.1%)	37 (13.0%)	2.45	.966
	Self-help	83 (29.2%)	63 (22.2%)	106 (37.3%)	32 (11.3%)	2.31	1.013

SA=Strongly Agree=5; A=Agree=4; D=Disagree=3; S=Strongly Disagree=4; D=Standard Deviation

RESEARCH QUESTION 3

WHAT IS THE RESEARCH SELF-EFFICACY LEVEL OF DOCTORAL STUDENTS IN UNIVERSITIES IN OGUN STATE?

As shown in Table 5, with an overall weighted mean of ($\bar{x}$=4.33), which is higher than the criterion mean ($\bar{x}$=3), it is apparent that the research self-efficacy level of doctoral students in universities in Ogun State was high. Six subconstructs were used to measure the research self-efficacy of respondents. Research conceptualization has a weighted mean of $\bar{x}$=4.4, SD=0.663. Considering specific items under the subconstruct, developing a research idea that will make contribution to your field by addressing an important gap in the existing research literature recorded the highest mean ($\bar{x}$=4.46) among doctoral students in universities in Ogun State, while presenting and defending your research idea before an academic panel or critical group came a little behind ($\bar{x}$=4.45). Choosing and operationalizing measures of dependent and independent variables recorded the lowest mean ($\bar{x}$=4.46). These findings appear to contradict widely held beliefs that most doctoral students found it difficult to identify researchable ideas that could contribute meaningfully to the body of literature, which would have harmed their confidence in defending such ideas before an academic panel or critical group. While it appeared as if the respondents' degree of confidence was high for most of the items under the subscale, choosing and operationalizing measures of dependent and independent variables scored the lowest mean. The implication of this is that doctoral students in universities in Ogun State might experience stagnation in their research endeavors as they might not be able to make meaningful progress without a full grasp of variable operationalization.

Table 5: Research Self-Efficacy Level of Doctoral Students in Universities in Ogun State

S/N	**Research Activities**	NC (1)	BC (2)	MC (3)	C (4)	AC (5)	Mean $\bar{x}$	SD
	Research Conceptualization $\bar{x}$=4.4, SD=0.663							
1	Develop a research idea that will make contribution to your field by addressing an important gap in the existing research literature	0	1 (.4%)	20 (7.0%)	109 (38.4%)	154 (54.2%)	4.46	.642
2	Present and defend your research idea before an academic panel or critical group	1 (.4%)	1 (.4%)	22 (7.7%)	106 (37.3%)	154 (54.2%)	4.45	.683
3	Write the background for a thesis	1 (.4%)	1 (.4%)	13 (4.6%)	130 (45.8%)	139 (48.9%)	4.43	0.633
4	Develop logical rationale for your research idea	1 (.4%)	0	18 (6.3%)	142 (50.0%)	123 (43.3%)	4.36	.633
5	Choose and operationalize measures of dependent and independent variables	1 (.4%)	4 (1.4%)	32 (11.3%)	143 (50.4%)	104 (36.6%)	4.21	.723
	Data Collection $\bar{x}$=4.3, SD=0.727							
6	Design a study methodology that will answer my research questions	0	3 (1.1%)	21 (7.4%)	112 (39.4%)	148 (52.1%)	4.43	.676

7	Ensure data collection is reliable across the entire process	1 (.4%)	0	28 (9.9%)	102 (35.9%)	153 (53.9%)	4.43	.697
8	Obtain participant's informed consent for my study	2 (.7%)	1 (.4%)	30 (10.6%)	114 (40.1%)	137 (48.2%)	4.35	.739
9	Select instrumentation that validly and reliably measures my construct(s)	2 (.7%)	0	33 (11.6%)	118 (41.5%)	131 (46.1%)	4.32	.733
10	Access research participants via appropriate networks	3 (1.1%)	1 (.4%)	39 (13.7%)	115 (40.5%)	126 (44.4%)	4.27	.788
Data Analysis $\bar{x}$=4.0, *SD*=0.903								
11	Employ appropriate methodology to analyze gathered data	3 (1.1%)	3 (1.1%)	44 (15.5%)	107 (37.7%)	127 (44.7%)	4.24	.827
12	Seek out resources to support research agenda when needed (e.g., trainings, mentors, funding sources, literature)	1 (.4%)	2 (.7%)	43 (15.1%)	137 (48.2%)	101 (35.6%)	4.18	.732
13	Conduct pilot study to establish instrument validity and reliability	8 (2.8%)	4 (1.4%)	32 (11.3%)	139 (48.9%)	101 (35.6%)	4.13	.874
14	Interpret a printout containing the results of a statistical analysis	7 (2.5%)	11 (3.9%)	71 (25.0%)	99 (34.9%)	96 (33.8%)	3.94	.982
15	Using statistical packages e.g., SPSS-X, SAS, etc	11 (3.9%)	23 (8.1%)	61 (21.5%)	93 (32.7%)	96 (33.8%)	3.85	1.098
Research Integration $\bar{x}$=4.4, SD=0.660								
16	Draw conclusions on the basis of the findings of a research study	1 (.4%)	0	15 (5.3%)	113 (39.8%)	155 (54.6%)	4.48	.632
17	Make recommendations based on the findings of the study	0	1 (.4%)	15 (5.3%)	131 (46.1%)	137 (48.2%)	4.42	.610
18	Defend research findings before faculty members, funding agents and critical audience	0	0	27 (9.5%)	111 (39.1%)	146 (51.4%)	4.42	.660
19	Based on the limitations of the study, suggest areas for further study	0	7 (2.5%)	17 (6.0%)	113 (39.8%)	147 (51.8%)	4.41	.715
20	Identify and fill an existing gap in the body of literature	0	2 (.7%)	21 (7.4%)	121 (42.6%)	140 (49.3%)	4.40	.658
21	Succinctly synthesize meaning from the results to develop implications	0	4 (1.4%)	26 (9.2%)	141 (49.6%)	113 (39.8%)	4.28	.686

Technical Writing/Documentation $\bar{x}$=4.4, SD=0.674								
22	Write a research proposal for your research idea	0	0	35 (12.3%)	92 (32.4%)	157 (55.3%)	4.43	.702
23	Format manuscripts in line with specified guidelines and standards	0	0	24 (8.5%)	116 (40.8%)	144 (50.7%)	4.42	.644
24	Independently and collaboratively write a research manuscript for publication	0	0	32 (11.3%)	101 (35.6%)	151 (53.2%)	4.42	.686
25	Accept and respond effectively to written or verbal criticism of my research and writing	0	0	22 (7.7%)	126 (44.4%)	136 (47.9%)	4.40	.630
26	Use clear language and logical reasoning to introduce my research idea when writing	0	0	34 (12.0%)	106 (37.3%)	144 (50.7%)	4.39	.692
27	Write the literature review for a thesis	0	0	34 (12.0%)	109 (38.4%)	141 (49.6%)	4.38	.690
Research Dissemination $\bar{x}$=4.3, SD=0.758								
28	Present findings to other professionals (e.g., conference proceedings, community partners)	1 (.4%)	2 (.7%)	31 (10.9%)	114 (40.1%)	136 (47.9%)	4.35	.728
29	Disseminate study findings through a well written research report	2 (.7%)	2 (.7%)	27 (9.5%)	119 (41.9%)	134 (47.2%)	4.34	.737
30	Identify appropriate professional journals or outlets to disseminate results through written text (e.g. manuscripts, reports)	1 (.4%)	2 (.7%)	35 (12.3%)	109 (38.4%)	137 (48.2%)	4.33	.745
31	Promote research findings by presenting at relevant academic and professional fora	0	4 (1.4%)	37 (13.0%)	117 (41.2%)	126 (44.4%)	4.29	.742
32	Present study findings in narrative, graphic and multimedia forms	3 (1.1%)	3 (1.1%)	49 (17.3%)	107 (37.7%)	122 (43.0%)	4.20	.837
Overall Weighted Mean							**4.33**	
Criterion Mean							**3**	

NC (Not Confident)=1; **BC** (Barely Confident)=2; **MC**(Moderately Confident)=3; **C**(Confident)=4 and **AC** (Absolutely Confident)=5 SD= Standard Deviation

For the data collection sub-scale, having a weighted mean of $\bar{x}$=4.3, SD=0.727, most of the items responded to attracted a high mean. For example, items bordering on their ability to design a study methodology that will answer their research questions and ensure data collection is reliable across the

entire process attracted the highest mean ($\bar{x}$=4.43) each, while the one on obtaining participant's informed consent for my study attracted $\bar{x}$=4.35. Similarly, the item on selecting instrumentation that validly and reliably measures research construct(s) received the highest mean (x = 4.32), while the item on gaining access to research participants through appropriate networks received the lowest mean (x = 4.27). Furthermore, the data analysis sub-scale attracted a weighted mean of ($\bar{x}$=4.0) with some of the accompanying research items following the trend. However, interpreting printouts containing the results of a statistical analysis and using statistical packages attracted lower mean of ($\bar{x}$=3.94) and ($\bar{x}$=3.85) respectively. In addition, results from the analyses showed that doctoral students' responses to research integration subscale attracted a weighted mean of ($\bar{x}$=4.4) with most of its underneath items falling above the weighted mean. Items like "drawing conclusions on the basis of the findings of a research study" polled a high mean of ($\bar{x}$=4.48), "make recommendations based on the findings of the study" ($\bar{x}$=4.42), "defend research findings before faculty members, funding agents and critical audience" ($\bar{x}$=4.42), and "based on the limitations of the study, suggest areas for further study ($\bar{x}$=4.41)." "Succinctly synthesize meaning from the results to develop implications" attracted the lowest mean ($\bar{x}$=4.28) under the subscale.

Further analyses revealed similar trends for the technical writing/documentation subscale with a weighted mean of ($\bar{x}$=4.4). Item on "writing a research proposal for your research idea" recorded the highest mean ($\bar{x}$=4.43) while writing the literature review for a thesis polled the lowest mean ($\bar{x}$=4.38), which is still higher than the criterion mean ($\bar{x}$=3). These findings are contrary to the prevailing situations of doctoral students, most of whom encounter challenges when it comes to writing winning proposals, theses, and research publications, which might have accounted for the low research productivity experienced by sampled doctoral students. According to the table, the weighted mean for the research dissemination subscale was ($\bar{x}$=4.3, with the mean for accompanying items ranging from the highest ($\bar{x}$=4.35) for the item "present findings to other professionals (e.g., conference proceedings, community partners)" to the lowest ($\bar{x}$=4.20) for the item "present study findings in narrative, graphic, and multimedia forms." Considering the findings from these analyses, it appears that the research self-efficacy of sampled doctoral students is high. In reality, however, the available evidence suggests that this is unlikely. This incongruity might not be unconnected with the human tendency to overestimate themselves when it comes to self-assessment, especially those involving competence.

RESEARCH QUESTION4

WHAT IS THE LEVEL OF RESEARCH PRODUCTIVITY OF DOCTORAL STUDENTS IN UNIVERSITIES IN OGUN STATE?

The results as shown in Table 6a reveal that doctoral students in universities in Ogun State scored low in research productivity before the commencement of their doctoral programs as the overall weighted mean ($\bar{x}$=1.84) is lower than the criterion mean ($\bar{x}$=3). A closer look at the items revealed that scholarly presentation at local, national, regional, and international conferences had the highest mean ($\bar{x}$=2.37) followed by research-based grants received ($\bar{x}$=2.14), manuscripts accepted for publication in the form of critiques, book reviews and other publications ($\bar{x}$=2.13), manuscripts accepted for publication in the form of research study in a peer-reviewed journal ($\bar{x}$=1.70), manuscripts accepted for publication in the form of textbooks ($\bar{x}$=1.60), and manuscripts accepted for publication in the form of book chapters ($\bar{x}$=1.47), while citation indices for existing published works recorded the lowest mean ($\bar{x}$=1.45). With doctoral students in universities in Ogun State scoring lower than the criterion mean in all the items, it is apparent that their research productivity was low before the commencement of the doctoral program.

Table 6.a: Research Products Produced Before Doctoral Program ($\bar{x}$=1.84, SD=1.05)

S/N	Research Products	0	1-2	3-4	5-7	8>	Mean	SD
1	Scholarly presentation at local, national, regional and international conferences	68 (23.9%)	101 (35.6%)	75 (26.4%)	21 (7.4%)	19 (6.7%)	2.37	1.125
2	Research-based grants received	81 (28.5%)	118 (41.5%)	62 (21.8%)	11 (3.9%)	12 (4.2%)	2.14	1.012
3	Manuscripts accepted for publication in the form of critiques, book reviews and other publications	124 (43.7%)	68 (23.9%)	51 (18.0%)	12 (4.2%)	29 (10.2%)	2.13	1.301
4	Manuscripts accepted for publication in the form of a research study in a peer reviewed journal	162 (57.0%)	74 (26.1%)	29 (10.2%)	10 (3.5%)	9 (3.2%)	1.70	1.005
5	Manuscripts accepted for publication in the form of textbooks	182 (64.1%)	67 (23.6%)	14 (4.9%)	9 (3.2%)	12 (4.2%)	1.60	1.020
6	Manuscripts accepted for publication in the form of book chapters	206 (72.5%)	52 (18.3%)	9 (3.2%)	5 (1.8%)	12 (4.2%)	1.47	.963
7	Citation indices for existing published works	208 (73.2%)	46 (16.2%)	18 (6.3%)	2 (0.7%)	10 (3.5%)	1.45	0.918
Criterion Mean							3	

In this study, the criterion for assessing the research productivity of respondents is that whenever the weighted mean is lower than the criterion mean, the research productivity of respondents is adjudged low. As shown in Table 6b, for research products produced during doctoral program, respondents still scored low as the weighted mean for all the items ($\bar{x}$=1.86) is lower than the criterion mean ($\bar{x}$=3). Details showed that citation indices for existing published works had the highest mean ($\bar{x}$=2.74) followed by scholarly presentation at local, national, regional, and international conferences ($\bar{x}$=2.22), research-based grants received ($\bar{x}$=1.95), manuscripts accepted for publication in the form of a research study in a peer-reviewed journal ($\bar{x}$=1.51), and manuscripts accepted for publication in the form of textbooks ($\bar{x}$=1.41), while manuscripts accepted for publication in the form of book chapters recorded the lowest mean ($\bar{x}$=1.21). Although, doctoral students still scored low in all the items, there was a slight improvement in citation indices for existing published work, moving from the lowest mean before the commencement of doctoral program to the highest mean during the program. This improvement might not be unconnected with the positive impact of the whole gamut of doctoral education on doctoral students. However, other research products, such as publication of a research study in a peer-reviewed journal, book, or chapter publications, remained unaffected.

Table 6b: Research Products Produced during Doctoral Program ($\bar{x}$=1.86 SD=0.91)

S/N	Research Products	0	1-2	3-4	5>	Mean	SD
1	Citation indices for existing published works	41 (14.4%)	50 (17.6%)	135 (47.5%)	58 (20.4%)	2.74	0.945
2	Scholarly presentation at local, national, regional, and international conferences	88 (31.0%)	101 (35.6%)	59 (20.8%)	36 (12.6%)	2.22	1.154
3	Research-based grants received	108 (38.0%)	105 (37.0%)	56 (19.7%)	15 (5.3%)	1.95	.965
4	Manuscripts accepted for publication in the form of critiques, book reviews and other publications	151 (53.2%)	63 (22.2%)	37 (13.0%)	33 (11.6%)	1.91	1.229
5	Manuscripts accepted for publication in the form of a research study in a peer reviewed journal	177 (62.3%)	80 (28.2%)	18 (6.3%)	9 (3.2%)	1.51	.768
6	Manuscripts accepted for publication in the form of textbooks	200 (70.4%)	64 (22.5%)	11 (3.9%)	9 (3.2%)	1.41	.758
7	Manuscripts accepted for publication in the form of book chapters	225 (79.2%)	44 (15.5%)	13 (4.6%)	2 (.7%)	1.27	.575
Criterion Mean						**3**	

As shown in Table 6c, even for research components of their doctoral programs, doctoral students in universities in Ogun State still scored low as the weighted mean ($\bar{x}$=3.15, SD=1.03) is still lower than the criterion mean ($\bar{x}$=5). A breakdown of the results showed that thesis post-field presentation had the highest mean ($\bar{x}$=4.18) followed by thesis pre-field presentation ($\bar{x}$=2.69) and seminar presentations ($\bar{x}$=2.69). As shown in the result, there were improvements from seminar works to pre-field and eventually post-field presentations, where majority indicated that their post-field presentation, were accepted without any correction. It could thus be inferred that the number of years already spent on the program could mediate on the research productivity of doctoral students in universities in Ogun State, Nigeria as they seemed to improve upon their previous performance.

Table 6c: Research Components of Doctoral Program ($\bar{x}$=3.15, SD=1.03)

Research Activity	Not Applicable (1)	Repeat Presentation (2)	Accepted After Major Corrections (3)	Accepted After Minor Corrections (4)	Accepted without any correction (5)	Mean ($\bar{x}$)	SD
Thesis Post-field Presentation	5(1.8%)	7(2.5%)	43(15.1%)	106 (37.3%)	123 (43.3%)	4.18	0.901
Thesis Pre-field Presentation	62 (21.8%)	46 (16.2%)	103 (36.3%)	64 (22.5%)	9 (3.2%)	2.69	1.138
Seminar Presentations	64 (22.5%)	46 (16.2%)	123 (43.3%)	50 (17.6%)	1 (0.4%)	2.57	1.036
Criterion Mean						5	

ANALYSIS AND PRESENTATION OF RESEARCH HYPOTHESES

Ho1: Information literacy will not have significant influence on research productivity of doctoral students in universities in Ogun State.

Table 7 presents the regression result on the influence of information literacy on research productivity of doctoral students in universities in Ogun State. The result revealed that information literacy (R^2= 0.076, F (1,282) = 4.582, p<0.05) has significant influence on the research productivity of doctoral students in universities in Ogun State. The regression coefficient (R^2=.076) indicates that information literacy could only account for 7.6% of the changes in their research productivity. By implication, other variables not included in this model may have accounted for the remaining variance. Consequently, the null hypothesis was rejected and restated thus: *information literacy will have a significant influence on research productivity of doctoral students in universities in Ogun State, Nigeria.* The import of this result, among others, is that the higher the information literacy possessed by doctoral students in universities in Ogun State, the greater, their research productivity. On the relative contribution of the indicators, results showed that information processing (β=.259, t=3.015, p<0.05), has a significant influence on doctoral students' research productivity, whereas information search (β=-.145, t=-1.848, p=.066), information evaluation (β=.086, t=.977, p=.330) and information communication and dissemination (β=-.059, t=-.753, p=.452) did not.

Table 7: Linear regression showing the influence of information literacy on research productivity of doctoral students in universities in Ogun State

Variables	*B*	*T*	*Sig.*	*R²*	*F(df)*	*ANOVA (Sig.)*
(Constant)	18.759	5.385	.000	0.076	4.582 (1,282)	.033
Information Search	-.145	-1.848	.066			
Information Evaluation	.086	.977	.330			
Information Processing	.259	3.015	.003			
Information Communication and Dissemination	-.059	-.753	.452			

Dependent Variable: Research Productivity
Predictor: Information Literacy
T Statistics = (283) 2.141
F Statistics (DF) =1, 282

Ho2: Research self-efficacy will not have significant influence research productivity of doctoral students in universities in Ogun State

The regression result in Table 8 revealed that research self-efficacy (R^2= 0.060, $F_{(1, 282)}$ = 17.218, p<0.05) has a significant influence on the research productivity of doctoral students in universities in Ogun State. The model showed that research self-efficacy was responsible for 6% of the changes in the research productivity of doctoral students in Ogun state, while the remaining 94% could be accounted for by other variables not included in this model. The result further revealed that the indicators of research self-efficacy have no individual contribution to the changes in doctoral students' research productivity. With this evidence, the null hypothesis was rejected and restated thus: *research self-efficacy has a significant influence on the research productivity of doctoral students in universities in Ogun State*. The import of this result, among others, is that the higher the research self-efficacy possessed by doctoral students in universities in Ogun State, the greater will be their research productivity.

Table 8: Linear regression showing the influence of research self-efficacy on research productivity of doctoral students in universities in Ogun State

Variables	***B***	***T***	***Sig.***	***R²***	***F(df)***	***ANOVA (Sig.)***
(Constant)	10.851	3.077	.002	0.060	17.218 (1,282)	.000
Research Conceptualization	.064	.677	.499			
Data Collection	-.034	-.344	.731			
Data Analysis	.121	1.372	.171			
Research Integration	.064	.677	.499			
Technical Writing/Documentation	.070	.601	.548			
Research Dissemination	.118	1.115	.266			

Dependent Variable: Research Productivity
Predictor: Research Self-Efficacy
T Statistics = (283) 4.149
F Statistics (DF) =1, 282

Ho3: Information literacy and research self-efficacy will not jointly influence research productivity of doctoral students in universities in Ogun State.

As shown in Table 9, the joint effect of the independent variables (information literacy and research self-efficacy) on the research productivity of doctoral students in universities in Ogun State was significant. The result also showed a coefficient of multiple correlations (R = 0.300) and a multiple R^2 of 0.09. This means that 9% of the variance was accounted for by the predictor variables when taken together. The significance of the composite contribution was tested at p<0.05. The table also showed that the Analysis of Variance (ANOVA) for the regression yielded an F-ratio of 9.207 (significant at 0.05 level). This implies that the joint contribution of the independent variables to the dependent variable was significant and that other variables not included in this model may have accounted for the remaining variance. Consequently, the null hypothesis was rejected and restated thus: *information literacy and research self-efficacy will jointly influence the research productivity of doctoral students in universities in Ogun State, Nigeria*. The import of this result, among others, is that the higher the information literacy and research self-efficacy possessed by doctoral students in universities in Ogun State, the greater will be their research productivity.

Table 9: Regression Analysis showing the joint effect of the independent variables (information literacy, research self-efficacy and critical thinking) on research productivity of doctoral students in universities in Ogun State

A N O V A							
Model	*Sum of Squares*	*DF*	*Mean Square*	*F*	*Adj. R²*	*Sig.*	*Remark*
Regression	1815.911	3	605.304	9.207	0.090	0.000	Sig.
Residual	18409.113	280	65.747				
Total	20225.025	283					

Dependent Variable: Research productivity
Predictors: (Constant), information literacy, research self-efficacy

RESULTANT MODEL

The resultant model (Figure1) shows that information literacy had a positive influence on the research productivity of doctoral students in universities in Ogun State, contrary to the formulated null hypothesis, consequent upon which the null hypothesis was rejected and restated that information literacy significantly influenced the research productivity of doctoral students in universities in Ogun State, Nigeria. The resultant model also showed that the second null hypothesis formulated was rejected and restated thus, research self-efficacy significantly influenced research productivity of doctoral students in universities in Ogun State, Nigeria. In addition, the third null hypothesis was also rejected and restated thus: Finally, the third hypothesis was also rejected and restated that information literacy and research self-efficacy jointly influenced the research productivity of doctoral students in universities in Ogun State, Nigeria.

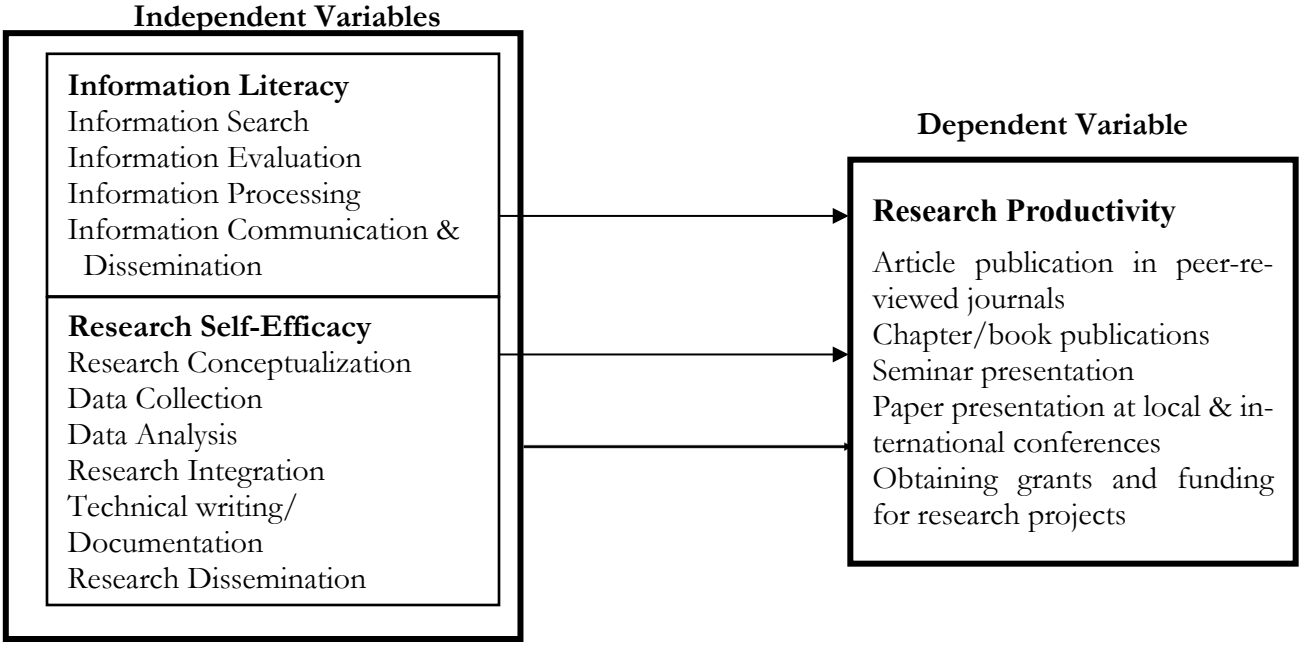

Figure 1: Resultant Model of Information Literacy, Research Self-efficacy and Research Productivity of Doctoral Students

DISCUSSION OF FINDINGS

This study assessed the influence of information literacy and research self-efficacy on the research productivity of doctoral students in universities in Ogun State. This section presents the findings and discussion of the study in line with related studies.

Findings from this study revealed that the research productivity of doctoral students in universities in Ogun State, Nigeria is low. For scholarly presentation at local, national, regional, and international conferences, 169 (59.9%) of the respondents produced between 0-2 before the commencement of their doctoral studies, which fell below the criterion mean of 3. The same applies to manuscripts accepted for publication in the form of book chapters and citation indices for existing published works, with 258 (90.8%) and 254 (89.4%) respondents falling below the criterion mean, respectively. This was corroborated by the studies of Poh et al. (2019) as well as Niehaus et al. (2018), which reported low research productivity among a cohort of doctoral students in Malaysia and the United States, with the majority of the participants struggling to complete their thesis. Specifically, McGaskey (2015) found that despite their rising numbers, Black doctoral students exhibited low research productivity in terms of presentation, submission, and publication output, with stage in doctoral program playing a significant role in students' research output, where those at the dissertation stage were found to have presented, submitted, and published more than those still taking courses. Similarly, Chesnut et al. (2015) further confirmed that level of study indeed influenced the research productivity of doctoral students.

Furthermore, studies such as Pelemo et al. (2020), Afolabi and Oladokun (2020), Oyedokun et al. (2019), and Obaseki and Agu (2019) found low research productivity among study participants. Findings from Afolabi and Oladokun (2020) showed that, despite the availability of information resources, sampled academics from Lead City University scored low in research productivity. While inference drawn from Pelemo et al. (2020) indicated that the research productivity of doctoral students at Federal University of Abeokuta was low in terms of research output where 799 (90.7%) of the respondents had challenges completing their dissertations and theses. Furthermore, Iwara (2019) reported low research publication output among doctoral students in Southern Africa, where fewer than five (5) out of the 32 study participants had published a research article within a year. Similarly, Yazon et al. (2019) in a study of academics across selected institutions in the Philippines revealed that only two out of the seven colleges surveyed showed moderate research productivity based on the study's pre-determined productivity index. Furthermore, Oyedokun et al. (2019) showed that despite possessing high information literacy skills and scoring high in general research competence, respondents scored low in handling research methodology, data analysis and discussions of findings.

However, Nwosu et al. (2015) and Anekwe (2018) reported high research productivity among respondents who were faculty members. In addition, studies like Horta and Santos (2016) as well as Pasupathy and Siwatu (2014) also established high research productivity among respondents. Results from Horta and Santos (2016) showed that those who published during their Ph.D. program had greater research production and productivity and greater numbers of yearly citations throughout their career compared to those who did not publish during their Ph.D. program. In Pasupathy and Siwatu (2014), respondents who were faculty members were more productive in presenting at conferences and less productive in publishing manuscripts in the form of book chapters. The differences in findings might just be a result of differences in study respondents. Likewise, Okiki (2013) revealed that the research productivity of academics from selected universities in Nigeria was high, particularly those in the North East and South West of Nigeria. As revealed in the results, it was only at the thesis post-field presentation that 106(37.3%) respondents indicated that their theses were accepted after minor corrections, while 123 (43.3%) indicated that their theses were accepted without any correction. This improvement, according to Chesnut et al. (2015), was attributable to positive course experiences, mentoring and research training environment.

Concerning the level of information literacy possessed by respondents, findings revealed that doctoral students in universities in Ogun State possessed a high level of information literacy. This finding was corroborated by Oyedokun et al. (2019), which revealed that postgraduate students in Olabisi Onabanjo University (OOU), Ago-Iwoye, and the Federal University of Agriculture, Abeokuta (FUNAAB), Nigeria possessed high information literacy skills. In addition, Nwosu et al. (2015) showed that the information literacy skills possessed by respondents were moderate. Okiki, (2013) in a study involving faculty members from selected universities in Nigeria, reported that the information literacy skills of academics in Nigerian federal universities were high and contributed significantly to their high research productivity. However, several other studies contradicted the current study. These included Pelemo et al. (2020), Afolabi and Oladokun (2020), Banik and Kumar (2019), Anekwe (2018), Rezaee et al. (2016) as well as Omeluzor et al. (2013). In Pelemo et al. (2020) as well as Afolabi and Oladokun (2020), sampled postgraduate students and faculty members were reported to possess low information literacy, with the majority of them unable to access the library's automated catalogue unless assisted by a librarian. Findings from Banik and Kumar (2019) showed that most of the participants scored low in information literacy skills, which precipitated poor academic performance. While Anekwe (2018) found that web-based information literacy had enhanced the research productivity of academics in both federal and state universities studied, respondents were reported to have scored low in web-based information literacy competence. Furthermore, findings from Rezaee et al. (2016) and Omeluzor et al. (2013) demonstrated that students did not have enough ability and skill in all five standards of information literacy, scoring below average.

SUMMARY OF FINDINGS

The study investigated the influence of information literacy and research self-efficacy on the research productivity of doctoral students in universities in Ogun State, Nigeria. Findings of the study have established that the research productivity of doctoral students in universities in Ogun State, Nigeria is low. The low research productivity manifested in the form of unusually prolonged doctoral education, high attrition rates, difficulties/inability to complete doctoral theses, which is the hallmark of doctoral education, and poor research publication measured in quality and quantity. To verify this fact among doctoral students in universities in Ogun State, the study employed a survey research design drawing on a sample of 306 respondents out of a target population of 1,418 doctoral students from six (6) participating universities guided by the Research Advisor's Table. The study used a questionnaire to gather data from respondents. Three research questions and one hypothesis tested at 0.05 level of significance guided the study. To establish the reliability of the questionnaire, a pre-test was conducted by the researcher at Bowen University, Iwo, Osun State, where 30 copies of the questionnaire were administered among doctoral students. The result of the reliability test showed that the questionnaire was reliable as all the measured constructs scored above 0.07.

Major findings of the study are summarized below:

1. Research productivity of doctoral students in universities in Ogun State, Nigeria was low as majority of the respondents scored below the criterion mean in all the measured items
2. This low research productivity was notable in research publication count, presentations at conferences and theses writing leading to unusually prolonged doctoral education for most of the respondents.
3. The study showed that doctoral students in universities in Ogun State, Nigeria possessed high level of information literacy.
4. There was a positive and significant relationship between information literacy and research productivity (R^2= 0.076, $F(1,282) = 4.582$, $p < 0.05$) of doctoral students in universities in Ogun State, Nigeria.
5. There was a positive and significant relationship between research self-efficacy and research productivity (R^2= 0.060, $F_{(1, 282)} = 17.218$, $p<0.05$) of doctoral students in universities in Ogun State, Nigeria.

6 Findings also revealed that the level of research self-efficacy of doctoral students in universities in Ogun State, Nigeria was high.

RECOMMENDATIONS

The following recommendations are made based on the findings of the study:

RESEARCH MENTORSHIP

Faculty should ensure that every doctoral student has access to a faculty advisor or mentor who is approachable and accessible. This will provide doctoral students with a roadmap for practice and constructive feedback. By strengthening doctoral student-faculty relationships, more opportunities arise for aspiring researchers to learn the general practices and procedures for conducting and designing studies, collecting and analyzing data, and writing a well-organized manuscript.

STRENGTHENING RESEARCH CAPACITY AND PRODUCTIVITY OF DOCTORAL STUDENTS

Policymakers and university administrators should focus on building the research capacity of doctoral students by exposing them to periodic training, workshops, tailored course work, conference attendance, and research collaboration with experienced researchers and teams.

BUILDING POSITIVE COURSE EXPERIENCES

Universities should engage in periodic review of academic curriculum that will be at par with changing times. Moreover, since the process of grooming and nurturing competent and productive researchers is a major goal of doctoral education, faculty should ensure good teaching, appropriate assessments, set clear goals and standards, and an appropriate workload that will create time and space for research.

RESEARCH FUNDING

In recognition of the importance of research and its productivity to the wellbeing of a nation, government should increase funding for education and, by extension, research activities of doctoral students most of whom may be financially handicapped. Existing funding arrangements should be well publicized and made easily accessible to doctoral students. Experienced faculty members should also be involved in connecting their students to funding agents and grooming them to come up with winning proposals. Moreover, doctoral education could be offered free as a form of encouragement to indigent students.

SUSTAINING AND IMPROVING EXISTING 21ST CENTURY SKILLS

Information literacy has been recognized as a 21st century skill and is considered an important educational outcome. To ensure that doctoral students remain relevant and up to date in an ever changing and dynamic information society, universities should constantly strive to sustain and possibly improve existing training platforms. Periodic workshops, seminars, and hands-on-practical sessions should be organized while student-centered teaching and learning methods should be encouraged.

SUGGESTIONS FOR FURTHER STUDIES

The current study investigated the influence of information literacy and research self-efficacy on the research productivity of doctoral students in universities in Ogun State. To further broaden this area of research, the following are suggested for further studies:

1. Conduct a qualitative investigation of information literacy, research self-efficacy, and research productivity of doctoral students. This may unveil more in-depth data not captured in the current study.
2. The current study can also be replicated in other states of the nation and other parts of the world as research productivity and its predictors cut across nations.
3. Further studies can investigate other combinations of research productivity predictors.

LIMITATIONS OF THE STUDY

Covid-19 and its effect on academic institutions

The devastating and disruptive effect of the dreaded COVID-19 took its toll on the administration of the research questionnaire. Doctoral students, the study's respondents, were not physically accessible at the participating universities.

Societal apathy

Societal apathy for research and knowledge rubbed off greatly on data collection. There was so much disdain for research, even among learned people.

Data objectivity

Another limiting factor is the bias associated with self-reported data. Studies have established a human tendency to overestimate themselves when prompted for self-assessment, especially those that have to do with competence and thinking abilities.

CONCLUSION

The study, which examined the influence of information literacy and research self-efficacy on the research productivity of doctoral students in universities in Ogun State, has succeeded in establishing the fact that the research productivity of respondents was indeed low. In addition, information literacy was found to have a positive and significant influence on the research productivity of doctoral students in universities in Ogun State, Nigeria. Consequently, learning environment that fosters further development of information literacy should be maintained. Universities should strive to always update their academic curriculum to reflect the ever-dynamic information landscape. Seeing the importance of research and its continued production to the prosperity of a nation in general and the sustenance of scholarship in particular, attention should be focused on unveiling the predictors of research productivity of doctoral students.

REFERENCES

Afolabi, T., & Oladokun, T. A. (2020). Information literacy skills, availability of information resources as factors influencing research productivity of academic staff of Lead City University, Nigeria. *Library Philosophy and Practice (e-journal),* Article 4165. https://digitalcommons.unl.edu/libphilprac/4165

Ajegbomogun, F. O., & Popoola, S. O. (2014). The influence of self-efficacy, perceived usefulness, accessibility and utilisation of internet resources as determinants of research productivity of lecturers in universities of agriculture in Nigeria. *Libri, 64*(2), 155–172.

Alhija, F. M., & Majdob, A. (2018). Predictors of teacher educators' research productivity. *Australian Journal of Teacher Education*, *42*(11). https://doi.org/10.14221/ajte.2017v42n11.3

Alrahlah, A. A. (2016). The impact of motivational factors on research productivity of dental faculty members: A qualitative study. *Journal of Taibah University Medical Sciences, 11*(5), 448-455. https://doi.org/10.1016/j.jtumed.2016.06.006

Anekstein, A. M., & Vereen, L. G. (2018). Research mentoring: A study of doctoral student experiences and research productivity. *The Journal of Counselor Preparation and Supervision, 11*(1), 1-28.

Anekwe, J. U. (2018). Impact of web-based information literacy on research productivity among academics in Nigerian federal universities. *International Journal of Multidisciplinary Research and Development, 5*(12), 218-226.

Association of College and Research Libraries. (2016). *Information Literacy Framework for Higher Education.* http://www.ala.org/acrl/standards/ilframework

Baltes, B., Hoffman-Kipp, P., Lynn, L., & Weltzer-Ward, L. (2010). Students' research self-efficacy during online doctoral research courses. *Contemporary Issues in Education Research, 3*(3), 51-58. https://doi.org/10.19030/cier.v3i3.187

Bandura, A. (2006). Toward a psychology of human agency. *Perspectives on Psychological Science,* 1, 164-180. https://doi.org/10.1111/j.1745-6916.2006.00011.x

Banik, P., & Kumar, B. (2019). Impact of information literacy skill on students' academic performance in Bangladesh. *International Journal of European Studies*, *3*(1), 27-33. https://doi.org/10.11648/j.ijes.20190301.15

Bland, C. J., Center, B. A., Finstad, D. A., Risbey, K. R., & Staples, J. G. (2005). A theoretical, practical, predictive model of faculty and department research productivity. *Academic Medicine*, *80*(3), 225-237. https://doi.org/10.1097/00001888-200503000-00006

Boswell, S. S. (2013). Undergraduates' perceived knowledge, self-efficacy, and interest in social science research. *The Journal of Effective Teaching, 13*(2), 48-57.

Boswell, S. S. (2014). Change in undergraduates' research self-efficacy: A pilot study. *The Online Journal of New Horizons in Education, 4*(4), 89-96.

Callaghan, C. W. (2016). Publish or perish: Family life and academic research productivity. *SA Journal of Human Resource Management 14*(1), Article 727. https://doi.org/10.4102/sajhrm.v14i1.727

Chesnut, S. R., Siwatu, K. O., Young, H. A., & Tong, Y. (2015). Examining the relationship between the research training environment, course experiences, and graduate students' research self-efficacy beliefs. *International Journal of Doctoral Studies, 10,* 399-418. https://doi.org/10.28945/2310

Dan, X., Xu, S. H., Liu, J. Y., Hou, R. N., Liu, Y. H., & Ma, H. W. (2018). Relationships among structural empowerment, innovative behaviour, self-efficacy, and career success in nursing field in mainland China. *International Journal of Nursing Practice, 24*(5), e12674.

Derntl, M. (2014). Basics of research paper writing and publishing. International Journal of Technology Enhanced Learning, 6, 105-123. https://doi.org/10.1504/IJTEL.2014.066856

Han, J., & Schuurmans-Stekhoven, J. (2016). Enhancement of higher degree candidates' research literacy: A pilot study of international students. *Asia-Pacific Educational Research, 26*(1–2), 31–41. https://doi.org/10.1007/s40299-016-0324-z

Hemmings, B., & Kay, R. (2010a). Research self-efficacy, publication output, and early career development. *International Journal of Educational Management,* 24(7), 562-574

Hemmings, B., & Kay, R. (2010b). University lecturer publication output: Qualifications, time and confidence count. *Journal of Higher Education Policy and Management*, 32:2, 185-197. https://doi.org/10.1080/13600800903575520

Hemmings, B., & Kay, R. (2015). The relationship between research self-efficacy, research disposition and publication output. *An International Journal of Experimental Educational Psychology* 36(2), 347-361. https://doi.org/10.1080/01443410.2015.1025704

Hemmings, B. C., Kay, R., Sharp, J., & Taylor, C. (2012). A transnational comparison of lecturer self-efficacy. *Journal of Further and Higher Education*, *36*(3), 291-307. https://doi.org/10.1080/0309877X.2011.614932

Heng, K., Hamid, M. O., & Khan, A. (2020). Factors influencing academics' research engagement and productivity: A developing countries perspective. *Issues in Educational Research*, *30*(3), 965-987. http://www.iier.org.au/iier30/heng.pdf

Hepworth, M., & Duvigneau, S. (2012). *Building research capacity: Enabling critical thinking through information literacy in higher education in Africa*. British Library for Development Studies at the Institute of Development Studies. https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/2301

Horta, H., & Santos, J. M. (2016). The impact of publishing during Ph.D. studies on career research publication, visibility, and collaborations. *Research in Higher Education,* 57(1), 28-50. https://doi.org/10.1007/s11162-015-9380-0

Igun, S. E., & Odafe, J. P. (2014). Information literacy among undergraduate students in Nigeria. *International Journal of Digital Literacy and Digital Competence*, *5*(3), 1-14. https://doi.org/10.4018/ijdldc.2014070101

Iwara, I. O. (2019). Causes and solution to poor involvement of post graduates in research publication enterprise: Case of a rural-based university in South Africa. *I-Manager's Journal of Educational Technology, 16*(2), 62-76. https://doi.org/10.26634/jet.16.2.16102

Jiang, W., Yuan, Y., & Zhang, L. (2019). Self-efficacy and research capacity of clinical nurses in China. *The Journal of Continuing Education in Nursing,* 50(11), 509-516. https://doi.org/10.3928/00220124-20191015-07

Lambie, G. W., Hayes, B. G., Griffith, C., Limberg, D., & Mullen, P. R. (2014). An exploratory investigation of the research self-efficacy, interest in research, and research knowledge of Ph.D. in education students. *Innovative Higher Education*, *39*(2), 139-153. https://doi.org/10.1007/s10755-013-9264-1

Lambie, G. W., & Vaccaro, N. (2011). Doctoral counselor education students' levels of research self-efficacy, perceptions of the research training environment, and interest in research. *Counselor Education & Supervision, 5*, 243-258. https://doi.org/10.1002/j.1556-6978.2011.tb00122.x

Liu, C., Wang, L., Qi, R., Wang, W., Jia, S., Shang, D., Shao, Y., Yu, M., Zhu, X., Yan, S., Chang, Q., & Zhao, Y. (2019). Prevalence and associated factors of depression and anxiety among doctoral students: The mediating effect of mentoring relationships on the association between research self-efficacy and depression/anxiety. *Psychology Research and Behavior Management*, 12*,* 195–208. https://doi.org/10.2147/PRBM.S195131

Madu, E. C., & Dike, V. W. (2012). An assessment of the relationship between information literacy competencies and academic productivity amongst staff in Nigerian universities in North Central geographical zone. *Journal of Emerging Trends in Computing and Information Sciences, 3*(2), 179-185.

Madukoma, E., & Adekunle, P. (2022). Information literacy, critical thinking, and research productivity of doctoral students in universities in Ogun State, Nigeria. *Library Philosophy and Practice,* Article 7050. https://digitalcommons.unl.edu/libphilprac/7050

McGaskey, F. G. (2015). Facilitating the creation of knowledge: An investigation of the factors that influence the research productivity of black doctoral students at predominantly white institutions. *The Journal of Negro Education*, *84*(2), 187-201.

Niehaus, E., Garcia, C. E., & Reading, J. (2018). The road to researcher: The development of research self-efficacy in higher education scholars. *Journal for the Study of Postsecondary and Tertiary Education, 3,* 1-20. https://doi.org/10.28945/3950

Nwosu, O. C., Obiamalu, A. R., & Udem, O. K. (2015). Relationship between information literacy skills and research output of academic staff in Nnamdi Azikiwe University, Awka, Nigeria. *Journal of Applied Information Science and Technology*, *8*(1), 89-108.

Nygaard, L. P. (2015). Publishing and perishing: An academic literacies framework for investigating research productivity. *Studies in Higher Education*, *42*(3), 519-532. https://doi.org/10.1080/03075079.2015.1058351

Obaseki, F. N., & Agu, N. (2019). Postgraduate students' attitude towards research, research self-efficacy and research anxiety as predictors of their achievement scores in a research method course in South-South Nigeria. *Educational Psychology Research Journal*, 1-16.

Okiki, O. C. (2013). *Information literacy skills and availability of information resources as factors influencing research productivity of academic staff of federal universities in Nigeria* [Unpublished Ph. D. Thesis]. University of Ibadan.

Omeluzor, S. U., Bamidele, I. A., Onuoha, U. D., & Alarape, A. A. (2013). Information literacy skills among postgraduate students of Babcock University, Nigeria. *International journal of Innovative Research in Management, 2*(12), 1-18.

Overall, N. C., Deane, K. L., & Peterson, E. R. (2011). Promoting doctoral students' research self-efficacy: Combining academic guidance with autonomy support. *Higher Education Research & Development*, *30*(6), 791-805. https://doi.org/10.1080/07294360.2010.535508

Oyedokun, S. O., Adekunmisi, S. R., Olusanya, F. O., Buraimo, O., & Bakre, A. (2019). Information literacy as determinant of research competency among postgraduates. *International Research*: *Journal of Library & Information Science, 9*(1), 14-29.

Oyewo, A. E., & Uwem, S. A. (2016). Information literacy, research, scholarship and publication; Comparative of Ph.D. students in Nigerian and South African Universities. *International Federation of Library Associations and Institutions/World Library and Information Congress (IFLA/WLIC),* 1-15.

Pasupathy, R., & Siwatu, K. O. (2014). An investigation of research self-efficacy beliefs and research productivity among faculty members at an emerging research university in the USA. *Higher Education Research & Development*, 33(4), 728-741.

Pelemo, G. D., Onanuga, A. O., Ilori, O. O., & Ugbala, C. P. (2020). Library orientation and information literacy skills as correlate of scholarly research of postgraduate students in Federal University of Agriculture, Abeokuta. *Library Philosophy and Practice (e-journal).* 1-17. 4059. https://digitalcommons.unl.edu/libphilprac/4059

Pinto, M., & Fernández-Pascual, R. (2016). Exploring LIS students' beliefs in importance and self-efficacy of core information literacy competencies. *College & Research Libraries*, 703-726.

Pinto, M., & Fernández-Pascual, R. (2017a). How a cycle of information literacy assessment and instruction stimulates attitudes and motivations of LIS students: A competency-based case study. *Journal of Librarianship and Information Science*, 1–17.

Pinto, M., & Fernández-Pascual, R. (2017b). A diagnosis of the levels of information literacy competency among social sciences undergraduates. *portal: Libraries and the Academy*, 17(3), 569-593. https://doi.org/10.1353/pla.2017.0035

Poh, R., Bin, A. G., & Abdullah, K. (2019). Factors influencing students' research self-efficacy: A case study of university students in Malaysia. *Eurasian Journal of Educational Research, 82*, 137-168. https://doi.org/10.14689/ejer.2019.82.8

The Research Advisors. (2006). *Sample size table.* http://research-advisors.com/tools/SampleSize.htm

Reyes-Cruz, M. R., & Perales-Escudero, M. D. (2016). Research self-efficacy sources and research motivation in a foreign language university faculty in Mexico: Implications for educational policy. *Higher Education Research & Development,* 35(4), 800-814. https://doi.org/10.1080/07294360.2015.1137884

Rezaee, R., Pourbairamian, G., & Zarifsanaie, N. (2016). Information literacy competency standards and critical thinking in higher education. *International Journal of Pharmacy & Technology, 8*(1),11494-11507.

Rooij, E., Fokkens-Bruinsma, M., & Jansen, E. (2019). Factors that influence Ph.D. candidates' success: The importance of Ph.D. project characteristics. *Studies in Continuing Education, 43*(1), 48-67. https://doi.org/10.1080/0158037X.2019.1652158

Sehoole, C. T. (2011). Student mobility and doctoral education in South Africa. *Perspectives in Education, 29*(1), 53-63.

Sevim, M., & Sarikaya, E. (2020). How to be productive in Ph.D. level: A needs assessment study for doctoral students' research productivity. *International Journal of Curriculum and Instruction, 12*(2), 75-94.

Simisaye, O. A., & Popoola, S. O. (2019). Relationship between information literacy skills and research productivity of researchers in Nigeria, and the mediating role of socio-economic factors. *Libres*, *29*(1), 51-76.

Udem, O. K., & Anaehobi, E. S. (2020). Relationship between information literacy skills acquisition and research self-efficacy of library and information science postgraduate students in South-East Nigerian universities. *UNIZIK Journal of Research in Library and Information Science (UJOLIS), 5*(1), 1-15.

Ulibarri, N., Cravens, A. E., Cornelius, M., Royalty, A., & Nabergoj, A. S. (2014). Research as design: Developing creative confidence in doctoral students through design thinking. *International Journal of Doctoral Studies, 9,* \ 249-270. https://doi.org/10.28945/2062

Westhuizen, S. V. (2014). Postgraduate students' attitudes towards research, their research self-efficacy and their knowledge of research. *South African Journal of Higher Edudation, 28*(4), 1414–1432. https://doi.org/10.20853/28-4-390

Yazon, A. D., Ang-Manaig, K., Buama, C. A. C., & Tesoro, J. F. B. (2019). Digital literacy, digital competence and research productivity of educators. *Universal Journal of Educational Research* 7(8): 1734-1743.

APPENDIX. INFORMATION LITERACY, RESEARCH SELF-EFFICACY AND RESEARCH PRODUCTIVITY QUESTIONNAIRE

SECTION A: Socio-Demographic Data

Name of Institution	Babcock University FUNAAB CU Tai Solarin University OU Mountain Top University
Please indicate your gender	☐ Male ☐ Female ☐ **Others**
Marital Status	☐ **Single** ☐ **Married** ☐ **Separated** ☐ **Divorced**
Age	☐ **20-30** ☐ **31-40** ☐ **41-50** ☐ **51-60** ☐ **61-70** ☐ **>71**
Program of Study/Department	
Specialization if different from program of Study	
Mode of Study	☐ **Part Time** ☐ **Full time**
Duration of Program	
No of Years already Spent on the Program	
Current Year of Study	
Program Status	☐ **Course Work** ☐ **Pre-field** ☐ **Post-field** ☐ **Viva**
Expected Year of Graduation	
Degree in View	

SECTION B: Research Productivity Scale

Instruction: For the following research products, kindly tick as applicable, the number you have produced before the commencement of your doctoral program.

Research Products Produced Before Doctoral Program	**0-2**	**3-4**	**5-7**	**8-10**
Research-based grants received				
Scholarly presentation at local, national, regional and international conferences				
Manuscripts accepted for publication in the form of a research study in a peer reviewed journal				
Manuscripts accepted for publication in the form of book chapters				
Manuscripts accepted for publication in the form of textbooks				
Manuscripts accepted for publication in the form of critiques; responses and comments; abstracts; book reviews and other publications				
Citation indices for existing published works				

For the following research products, kindly tick as applicable, the number you have produced in the course of your doctoral program.

Research Products Produced During Doctoral Program	**0-1**	**2-3**	**4-5**	**6>**
Research-based grants received				
Scholarly presentation at local, national, regional and international conferences				
Manuscripts accepted for publication in the form of a research study in a peer reviewed journal				
Manuscripts accepted for publication in the form of book chapters				
Manuscripts accepted for publication in the form of textbooks				
Manuscripts accepted for publication in the form of critiques; responses and comments; abstracts; book reviews and other publications				
Citation indices for existing published works				

Please indicate the decisions of members of the faculty as applicable to the underlisted research components of your program using (a) **accepted without any correction=4; (b) accepted after minor corrections=3; (c) accepted after major corrections=2 and (d) repeat presentation=1**

	4	**3**	**2**	**1**
Research Activity				
Seminar Presentations				
Thesis Pre-field Presentation				
Thesis Post-field Presentation				

SECTION C

Dear respondents, kindly indicate your level of proficiency to the following information literacy items using the following scales: **Highly Proficient=5, (b) Proficient=4, (c) Moderately Proficient=3, (d) Barely Proficient=2 and (e) Not proficient=1**

Information literacy is an intellectual framework that equips learners with the requisite knowledge to identify information gap and adapt all existing technologies to access, evaluate, retrieve, use and synthesize the retrieved information in an ethical manner to produce new information						
S/N	**INFORMATION SEARCH: My ability to:**	**5**	**4**	**3**	**2**	**1**
1	Find printed sources of information (books, papers, etc.)					
2	Find electronic sources of information (Library OPACs, e-databases, e-journals, etc.)					
3	Search for and retrieve internet information (advanced searches, directories,..)					
4	Use informal electronic sources of information (blogs, social media, wikis, listservs, etc.)					
5	Know information-search strategies (descriptors, Boolean operators, etc.)					
	INFORMATION EVALUATION: My ability to:	**5**	**4**	**3**	**2**	**1**
6	Assess the quality of information resources					
7	Recognize the author's ideas within the text					
8	Know the typology of scientific information sources (thesis, proceedings, etc.)					
9	Determine whether an information resource is updated					
10	Know the most relevant authors and institutions within your subject area					
	INFORMATION PROCESSING: My ability to:	**5**	**4**	**3**	**2**	**1**
11	Systematically arrange and abstract information					
12	Recognize text structure					
13	Use database managers (Access, MySQL, etc.)					
14	Use bibliographic reference managers (Endnote, Reference Manager, etc.)					

	INFORMATION COMMUNICATION AND DISSEMINATION My ability to:	5	4	3	2	1
15	Communicate in public					
16	Know the code of ethics in your academic/professional field					
17	Know the laws on the use of information and intellectual property					
18	Create academic presentations (PowerPoint, etc.)					
19	Disseminate information on the internet (webs, blogs, etc.)					

SECTION D: Information Literacy Acquisition Scale

Kindly indicate how you acquire your information literacy using **strongly agree=4; agree=3; disagree=2 and strongly disagree=1**

S/N	I acquire my information literacy through	4	3	2	1
1	Self-help				
2	One on one consultation with librarians				
3	Information literacy course				
4	Assistance from colleagues				`
5	Training offered by my faculty/department				
6	Library orientation				
7	Info literacy workshops/seminars				
8	Online Tutorials				

Others, please indicate……

SECTION E: Research Self-Efficacy Scale

Considering your ability to engage in various aspects of the research process, kindly indicate the degree of confidence you have in your ability to engage successfully in the following research tasks using the following scales **Absolutely Confident=5 (b) Confident=4 (c) Moderately Confident=3 (d) Barely Confident=2 and (e) Not Confident=1**

Research self-efficacy is an inner force within individuals that drives them to successfully complete all research related activities from ideation to completion within a specified timeframe. Such research related activities include research conceptualization, data collection, data analysis, research integration, technical writing/documentation and research dissemination.

	Research Conceptualization					
S/N	**Kindly take a moment and indicate your degree of confidence in your ability to engage successfully in the following research tasks**	**5**	**4**	**3**	**2**	**1**
1	Develop a research idea that will make contribution to your field by addressing an important gap in the existing research literature					
2	Develop logical rationale for your research idea					
3	Present and defend your research idea before an academic panel or critical group					
4	Choose and operationalize measures of dependent and independent variables					
5	Write the background for a thesis					
	Data Collection	**5**	**4**	**3**	**2**	**1**
6	Design a study methodology that will answer my research questions					
7	Access research participants via appropriate networks					
8	Obtain participant's informed consent for my study					
9	Select instrumentation that validly and reliably measures my construct(s)					
10	Ensure data collection is reliable across the entire process					
	Data Analysis	**5**	**4**	**3**	**2**	**1**
11	Employ appropriate methodology to analyze gathered data					
12	Seek out resources to support research agenda when needed (e.g., trainings, mentors, collaborators, funding sources, literature)					

13	Conduct pilot study to establish instrument validity and reliability					
14	Using statistical packages e.g., SPSS-X, SAS, etc.					
15	Interpret a printout containing the results of a statistical analysis					
Research Integration		**5**	**4**	**3**	**2**	**1**
16	Identify and fill an existing gap in the body of literature					
17	Succinctly synthesize meaning from the results to develop implications					
18	Make recommendations based on the findings of the study					
19	Draw conclusions on the basis of the findings of a research study					
20	Defend research findings before faculty members, funding agents and critical audience					
21	Based on the limitations of the study, suggest areas for further study					
Technical Writing/Documentation		**5**	**4**	**3**	**2**	**1**
22	Accept and respond effectively to written or verbal criticism of my research and writing					
23	Format manuscripts in line with specified guidelines and standards					
24	Independently and collaboratively write a research manuscript for publication					
25	Use clear language and logical reasoning to introduce my research idea when writing,					
26	Write a research proposal for your research idea					
27	Write the literature review for a thesis					
Research Dissemination		**5**	**4**	**3**	**2**	**1**
28	Present findings to other professionals (e.g., conference proceedings, community partners)					
29	Disseminate study findings through a well written research report					
30	Identify appropriate professional journals or outlets to disseminate results through written text (e.g. manuscripts, reports)					
31	Present study findings in narrative, graphic and multimedia forms					
32	Promote research findings by presenting at relevant academic and professional fora					

AUTHORS

Dr. Paul Adesola Adekunle, a Certified Librarian of Nigeria (CLN), currently heads the Information Research and Instructional Services Section of the library and had at various times headed the Periodicals, Cataloguing and Classification as well as Information Access Management sections of Timothy Olagbemiro Library, Bowen University, Iwo, Osun State, Nigeria. He holds a doctorate degree, Information Resources Management, Babcock University, Master of Library and Information Studies (M.L.S.) and Bachelor of Science degree B. Sc. (Hons) Political Science both from the University of Ibadan. He has attended a lot of trainings, conferences and workshops on social media and Web 2.0 applications for information gathering, processing and dissemination, Open-Source Management Software for institutional repository, etc. In addition to his highly demanding professional and administrative duties, Adekunle teaches information literacy as an academic librarian at Bowen University. A savant of information science and au fait with ICTs and library software, Adekunle has published sizable number of articles in reputable and peer-reviewed international journals. His research interests include social media applications, library software, assistive and interactive technologies, current and emerging ICTs, digitization, digital and information literacy, information retrieval, competitive intelligence, information use/user studies, information theories and knowledge management.

Dr. Ezinwanyi Madukoma, an Associate Professor, currently heads the Department of Information Resources Management (IRM), Babcock University, where she has been a faculty member for close to two decades. Dr. Madukoma holds a doctoral degree in Information Resources Management, Babcock University, Ilishan-Remo, Ogun State, master degree in Library and Information Science, University of Ibadan, Ibadan, Nigeria and a Bachelor of Science degree in Information Resources Management, Babcock University, Ilishan-Remo, Ogun State, Nigeria. Prior to joining the faculty as an academic staff, she had worked in the library for 17 years. In recognition of her productivity, she has won many awards, including the 2016 Best Lecturer Award as well as the 2017 Service Award.

Dr. Madukoma has written a number of book and book chapters as well as published many articles in reputable peer-reviewed, national and international journals. Her research interests include information literacy, information seeking behavior, library and information management and knowledge management, among others.

Dr. Madukoma is married and blessed with three children. She enjoys listening to good music, both Christian and traditional. She also loves watching romantic movies and likes committed people.