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May 2022

Research Self-Efficacy and Research Productivity of Doctoral Students in Universities in Ogun State

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Adekunle, Adesola Paul and Madukoma, Ezinwanyi, "Research Self-Efficacy and Research Productivity of Doctoral Students in Universities in Ogun State" (2022). *Library Philosophy and Practice (e-journal)*. 7097. <https://digitalcommons.unl.edu/libphilprac/7097>

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

BY

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Abstract

The study investigated the influence of research self-efficacy on research productivity of doctoral students in universities in Ogun State, Nigeria. The study employed a survey research design drawing on a sample of 309 respondents out of a target population of 1,418 doctoral students from six participating universities guided by the Research Advisor's Table. Findings of the study established that research productivity of doctoral students in universities in Ogun State, Nigeria was low. The low research productivity manifested in form of unusually prolonged doctoral education, high attrition rates, difficulties/inability to complete doctoral thesis which is the hallmark of doctoral education and poor research publication measured in quality and quantity. The study also established a positive significant relationship between research self-efficacy and research productivity of doctoral students. The study concluded by recommending periodic review of curriculum to reflect changes in the ever dynamic information landscape.

Keywords

Research productivity, Research Output, Research Self-Efficacy, Self-Efficacy, Doctoral students, Universities, Nigeria

Introduction

The prosperity of any nation is inextricably tied to her 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, Garcia and Reading (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 to be enhanced.

As success without successor is short-lived, so is the sustainability of research productivity without adequate plan to mentor and train new generation of researchers that will possibly take over at a point because all categories of academics will eventually bow out of the system at a point. Universities across the world through doctoral education have put in place a process of training, mentoring and initiating successive generations into the research culture through what is known as postgraduate education especially at the doctoral level. Also, doctoral training programs are designed to prepare students to take on the rigors of research (Niehaus, Garcia & Reading, 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, underdeveloped strategies for thesis writing, leading to academic roadblocks and even suicide (Chesnut, Siwatu, Young & Tong 2015; Niehaus, Garcia & Reading, 2018; Obaseki & Agu, 2019; Pelemo, Onanuga, Ilori. & Ugbala 2020; Poh, Bin & Abdullah, 2019; Rooij, Fokkens-Bruinsma & Jansen, 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 (5) 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 lack of critical thinking and information literacy. In Nigeria, studies like Oyedokun, et al. (2019), Pelemo, et al. (2020) as well as Obaseki and Agu (2019) have established low research productivity of doctoral students.

As established in the literature, research self-efficacy is another variable that may affect research productivity of doctoral students as research has been established to be challenging and requiring strong psychological and emotional conditions for sustainability (Jiang, Yuan & Zhang, 2019; Ulibarri, et al., 2014). Following Bandura's social cognitive theory, self-efficacy is described as an individual's belief about what he or she can achieve in a given context. 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. Also, 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; 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 students' supervision (Chesnut, Siwatu, Young & Tong 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; 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., 2013; 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).

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

Literature Review

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, Center, Finstad, Risbey, and Staples (2005) described and grouped the factors affecting research productivity into three as individual, institutional and administrative. In another study, Hemmings and Kay (2010) examined the factors that influence lecturers' research productivity in Australia; Hemmings, Kay, Sharp and Taylor (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, Hamid and Khan (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, Deane and Peterson (2011) promoting doctoral students' research self-efficacy through a combination of academic guidance and autonomy support; Alhija and Majdob (2017) studied predictors of teacher educators' research productivity

Furthermore, Lambie, Hayes, Griffith, Limberg and Mullen (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 determinant of research productivity using the framework of academic literacies; Jiang, Yuan and Zhang (2019) examined the influence of self-efficacy and research capacity of clinical nurses in China; Rooij, Fokkens-Bruinsma and Jansen (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 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 research productivity of scholars at various levels, none of these studies to the best of the author's knowledge have examined the influence of information literacy and research self-efficacy on research productivity of doctoral students.

The current study, aiming to assess the influence of research self-efficacy on 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 of 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 majority of studies on this topic have been carried out mainly in western nations.

For research self-efficacy and research productivity, an appraisal of the literature shows a considerable number of studies. (Ajegbomogun & Popoola, 2014; Baltes, et al., 2010; Boswell, 2013; Boswell, 2014; Chesnut, et al., 2015; Dan, et al., 2018; Hemmings & Kay, 2015; Lambie, et al., 2013; Liu, et al., 2019; Obaseki & Agu, 2019; Pasupathy & Siwatu, 2014). However, most of these studies focused on academic 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 and Popoola (2014) was the only Nigerian study on research self-efficacy and research productivity of academic staff in Universities of Agriculture

Objective of the Study

The study investigated the influence of research self-efficacy on the research productivity of doctoral students in universities in Ogun State, Nigeria. It also

1. examined the level of research productivity of doctoral students in universities in Ogun State;
2. determine the research self-efficacy level 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 research productivity of doctoral students in universities in Ogun State, Nigeria?
2. What is the level of research self-efficacy of doctoral students in universities in Ogun State?

Hypotheses

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

H₀2: Research self-efficacy will not significantly influence research productivity of doctoral students in universities in Ogun State

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

A simple random probability and proportionate 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. Research Advisors (2006) published 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, proportionate 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. ($306 \div 1,418$) in all the universities and multiplied by the target population in each of the universities as shown in Table 1

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	$306 \div 1,418 \times 300$	65
2	Covenant University, Ota	$306 \div 1,418 \times 211$	45
3	Federal University of Agriculture,	$306 \div 1,418 \times 170$	36
4	Mountain Top University, Mowe	2	2
5	Olabisi Onabanjo University, Ago Iwoye	$306 \div 1,418 \times 719$	155
6	Tai Solarin University of Education	$306 \div 1,418 \times 16$	3
	Total	1,418	306

Research Instrument

The research questionnaire used for this study titled “**Research Self-Efficacy and Research Productivity Questionnaire**” was divided into the following 3 sections: Section A captured the demographic data of respondents. Section B was 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 measured the degree of research self-efficacy of respondents from research ideation to research completion.

Reliability of Instrument

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. Forty (40) copies of the questionnaire were administered to doctoral students at Bowen University, Iwo, Osun State out of which thirty (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	Research Productivity	17	0.76
2	Information Literacy	27	0.92
3	Research Self-Efficacy	32	0.90

Method of Data Collection

Data was collected from respondents through the designed questionnaire administered by the researcher and trained assistants. While the distribution and collection of 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 (2) 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 collected was subjected to descriptive analysis involving mean, standard deviation, frequency count, percentages and analyzed using Statistical Package for Social Science (SPSS) version 20.0 for windows. Inferential statistical analysis such as ANOVA, was also applied to determine the influence of the independent variable 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 any other consideration was obtained before the field study. Furthermore, participants were informed of what the whole study was all 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 this study. Also, 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

Demographical 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 (6) 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 for doctoral program probably because of the enormous challenges associated with it. 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 started early so they can finish before advancing in age.

Research Question1: What is the level of research productivity of doctoral students in universities in Ogun State?

Table 3: 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	

The results as shown in Table 3 revealed 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 ($\bar{x}=1.60$); 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 4: 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	

Source: Field Survey (2022)

Decision Rule: Research productivity is low if weighted mean is lower than criterion mean

As shown in table 4, 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 ($\bar{x}=1.51$); 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 on 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 the doctoral students. However, other research products like publication in the form of a research study in peer reviewed journal, book and chapter publications remained unchanged.

Table 5: 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	

Source: Field Survey (2022)

As shown in table 5, 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 presentations were accepted without any correction. It could thus be inferred that 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 previous performance.

Research Question 2: What is the level of research self-efficacy of doctoral students in universities in Ogun State?

Table 6: 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%)		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%)		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%)		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	

Source: Field Survey (2022)

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

Decision Rule: Research Self-Efficacy is low if overall weighted mean is lower than criterion mean

As shown in table 6, 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 incongruous with widely held beliefs that most doctoral students found it difficult identifying researchable ideas that could make meaningful contributions to the body of literature which would have affected their confidence to defend 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

For data collection sub-scale, with a weighted mean of $\bar{x}=4.3$, $SD=0.727$, most of the items responded to attracted 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 $\bar{x}=4.35$. In the same vein, item on selection of instrumentation that validly and reliably measures research construct(s) attracted ($\bar{x}=4.32$) while accessing research participants via appropriate networks attracted the lowest mean $\bar{x}=4.27$. Similarly, data analysis sub-scale attracted a weighted mean of $\bar{x}=4.0$, $SD=0.903$ with some of the accompany research items following the trend. However, interpreting printout 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. Also, revelation from the analyses showed that doctoral students' responses to research integration subscale attracted a weighted mean of $\bar{x}=4.4$, $SD=0.660$ 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 trend for 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 prevailing situations of doctoral students most of whom encounter challenges when it comes to writing winning proposals, thesis and research publications which might have accounted for the low research productivity experienced by sampled doctoral students. As shown on the table, research dissemination subscale scored a weighted mean of $\bar{x}=4.3$ with mean for accompanying items ranging in close proximity 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 findings from these analyses, it appeared that the research self-efficacy of sampled doctoral students is high. In reality however, this may be farfetched as available evidences point to the contrary. This

incongruity might not be unconnected with human tendency to overestimate themselves when it comes to self-assessment, especially those bordering on competence.

Analysis and Presentation of Research Hypothesis

H₀₁: Research self-efficacy will not have significant influence research productivity of doctoral students in universities in Ogun State

Table 7: Linear regression showing the influence of research self-efficacy on research productivity of doctoral students in universities in Ogun State

Variables	<i>B</i>	<i>T</i>	<i>Sig.</i>	<i>R</i> ²	<i>F</i> (<i>df</i>)	<i>ANOVA</i> (<i>Sig.</i>)
(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

The regression result in table 7 revealed that research self-efficacy ($R^2 = 0.060$, $F_{(1, 282)} = 17.218, p < 0.05$) has a significant influence on 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 contributions to the changes in doctoral students' research productivity. With this evidence, the null hypothesis was rejected and restated thus: research self-efficacy will have significant influence on 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

Resultant Model

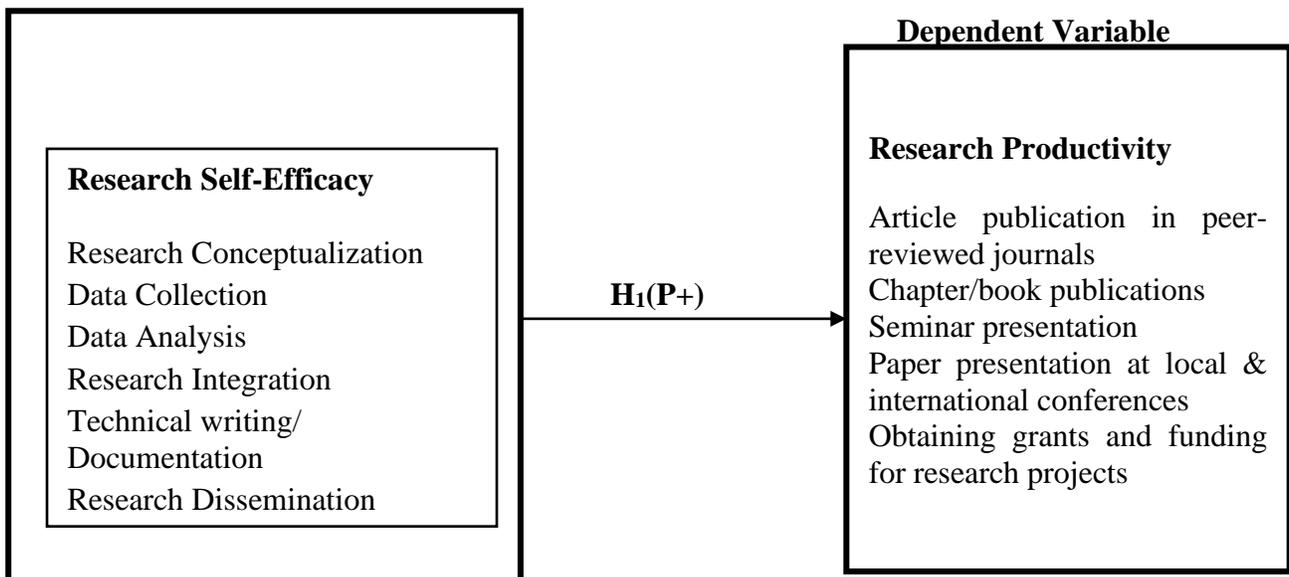


Figure 1: Conceptual Model of Research Self-Efficacy and Research Productivity
Source: Adekunle & Madukoma (2022)

The resultant model (Fig.1) shows that research self-efficacy had positive influence on the research productivity of doctoral students in universities in Ogun State, contrary to formulated null hypothesis consequent upon which the null hypothesis was rejected and restated that research self-efficacy will significantly influence research productivity of doctoral students in universities in Ogun State, Nigeria.

Discussion of Findings

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

Findings from this study revealed that 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, Bin and Abdullah (2019) as well as Niehaus, Garcia and Reading (2018) which reported low research productivity among a cohort of doctoral students in Malaysia and the United States with majority of the participants struggling to complete their thesis. Specifically, McGaskey (2015) found that despite their rising number, 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 than those still taking courses. Similarly, Chesnut, et al. (2015) further confirmed that level of study indeed influenced research productivity of doctoral students.

In Nigeria, studies like Pelemo, et al. (2020), Afolabi and Oladokun (2020), Oyedokun, et al. (2019), as well as Obaseki and Agu (2019) had established low research productivity among study sample. 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 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. Also, Iwara (2019) reported low research publication output among doctoral students in Southern Africa where less than five (5) out of the 32 study participants had published a research article within a year. Also, Yazon, Ang-Manaig, Buama and Tesoro (2019) in a study of academics across selected institutions in 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, Obiamalu and Udem (2019) 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 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 Ph. D. program. In the study of 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 as 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.

On level of research self-efficacy possessed by the respondents, findings revealed that doctoral students at universities in Ogun State possessed high level of research self-efficacy. This finding was supported by Garnasih, Primiana, Effendi and Joeliaty (2017) which showed that research self-efficacy among the studied lecturers were high especially in writing the introduction, research methodology, discussion of results and research publication. Also, finding from Chesnut, et al. (2015) showed that doctoral students in their 3rd year of training had higher research self-efficacy scores than did 1st and 2nd year students. Additionally, higher research self-efficacy was associated with higher interest in research and scholarly publication experience. However, Jiang, Yuan and Zhang (2019) in a study involving Chinese nurses found that majority (60.9%) of the nurses' research self-efficacy was low. Similarly, Niehaus, Garcia and Reading (2018) in a qualitative study involving 17 doctoral students indicated that the research self-efficacy of study participants were not yet developed and impacted negatively on the process of writing their theses and the overall research culture of the doctoral program.

Summary

The study investigated the influence of information literacy on research productivity of doctoral students in universities in Ogun State, Nigeria. Findings of the study established that research productivity of doctoral students in universities in Ogun State, Nigeria is low. The low research productivity manifested in form of unusually prolonged doctoral education, high attrition rates, difficulties/inability to complete doctoral thesis 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 309 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 adopted 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 in Bowen University, Iwo, Osun State where 30 copies of the questionnaire were administered among doctoral students. 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 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 possessed high level of research self-efficacy.
4. 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.

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 the respondents was indeed low. In addition, information literacy was found to have positive significant relationship with 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 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.

Recommendations

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

Research Mentorship

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.

Strengthening Research Capacity and Productivity of Doctoral Students

Policy makers and university administrators should focus on building the research capacity of doctoral students by exposing them to periodic trainings, workshops, tailored course works, 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. Also, 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 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 to education and by extension research activities of doctoral students most of whom may be financially handicapped. Existing funding arrangement 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 and critical thinking are listed among the 21st century skills and considered important educational outcomes. Universities therefore should constantly strive to sustain and possibly improve upon existing training platforms to ensure that doctoral students remain relevant and up-to-date in an ever changing and dynamic information society. 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, research self-efficacy and critical thinking 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, critical thinking 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 combination of other variables and their influence on research productivity.
4. The study can be replicated in other states in Nigeria as well as other parts of the world.

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 who were the respondents of the study were not physically accessible in 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 bias associated with self reported data. Studies have established human tendency to overestimate themselves when prompted for self-assessment especially those that have to do with competence and thinking abilities.

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