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Analysis of Research Productivity of Male and Female Academics in Private Universities in South-East, Nigeria: A Scorecard for Gender Parity Advocates

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ABSTRACT
The variations in research productivity between men and women are a burning issue of discourse in academia. The importance of research to academics, higher institutions and the nation at large; and the need to bridge the gender gap in this regard for the actualization of sustainable development goal five and millennium development goal three can never be overemphasized. This study used ex post facto design to examine the gender based variations in research productivity of academics in private owned universities situated in South-East zone of the country (Nigeria). One research question was employed in the study and one hypothesis was tested. A sample of 223 academics drawn from a population of 1,762 academics in four private universities in two states in South-East, Nigeria were selected as the sample for the study using the multistage sampling procedure which involved proportionate stratified sampling and simple random sampling techniques. An instrument, titled Academic Staff Research Productivity Questionnaire (ASRPQ), was developed for collection of data for the study, and was validated by three experts, who are lecturers in Faculty of Education, Nnamdi Azikiwe University, Awka. Cronbach Alpha was used to ascertain reliability of the instrument, which yielded a coefficient of 0.73. The mean score was used to answer the research questions while independent samples t-test was used to test the hypotheses at 0.05 level of significance. The results revealed that out of the eighteen forms (nine local and nine international) of research output investigated, male academics were more productive in research than their female counterparts in thirteen forms of research output while female academics were more productive than their male counterparts in only two forms of research output. Both gender types had the same mean score in two forms of research output and no research output in one form – international patents and certified invention. The test of the hypothesis also revealed an insignificant difference in research productivity of male and female academics in 16 forms of research output while a significant difference exists in only one form of research output –international book chapters. Based on the findings, it was recommended among others that the management of private universities should create a positive research culture in their universities that will encourage female academics to thrive in their research endeavours.

Key words: Gender Parity; Research; Research Productivity; Academics; Private Universities

I. INTRODUCTION

There's been a strong advocacy for women empowerment all over the world. The education sector in Nigeria is not left out in this movement. Policies on women empowerment are obvious at the international, national, state and local levels in several sectors of the nation, but there's still a yawning gap between policy making and their implementation at the grass root level. There are reports from scholarly literature on the existence of variations in research productivity among male and female academics in higher institutions, and this has attracted the interest of researchers in academia. Conducting research and the publication of results via various mediums is so important that it constitutes a vital prerequisite for promotion and recognition of academics in both local and international platforms; it attracts institutional prestige; and provides solutions to various problems faced by the nation, among others

(Iroaganachi & Izuagbe, 2018; Sulo, Kendagor, Kosgei, Tuitoek & Chelangat, 2012; Kpolovie & Onoshagbegbe, 2017; Okpe, Simisaye & Otuza, 2013)

Despite the indispensability of research to institutions and the nation at large, scholars (Igiri, Okoduwa, Akabuogu, Okoduwa, Enang, Idowu, Abdullahi, Onukak, Onuruka, Christopher, Salawu, Chris and Onyemachi, 2021; Mbachu & Unachuckwu, 2022a; Uwizeye, Karimi, Thiong'o, Syonguvi, Ochienge, Kiroro, Gateri, Khisa & Wao, 2021; Yusuf, 2012) have reported profound low research productivity of academics in developing countries, Nigeria inclusive. The importance of research requires the effectual participation of both female and male academics in order to reap its enormous advantages. Notable innovations and technological advancements recorded in the western world have been the results of dogged research efforts of both female and male research workers. But sadly, Aina, Ogunlade, Ilesanmi and Afolabi (2015) have complained that sometimes, commendable works of female researchers are barely publicized in comparison those of male researchers. Astegiano, Sebastian-Gonzalez and Castanho (2019) also complained that women underrepresentation in science-based disciplines has been associated with women being less productive than men, having lower success rate and suffering gender bias. Collins and Steffen (2019) also observed that female academics in some departments have limited career-advancing opportunities as a result of limited exposure to social networks, lack of mentors, less funding for research, and low involvement in decision-making.

Some other factors leading to the gender productivity gap as reported by scholars (Akinwumi & Unaeze, 2013; Lone & Hussain 2017; Nwajiuba, 2011; Salami, 2005) include: cultural/traditional factors, social factors, child birth and care, family roles, among others. All these notwithstanding, several movements have been in motion to bridge the gender disparity gap, especially in academia. Some global policy regulations for bridging the gender divide include the United Nations Millennium Development Goal (MDGs) on promoting gender equality and women empowerment (United Nations, 2015) and Sustainable Development Goals (SDGs) which also stressed gender equality as a goal.

Several studies have shown disparities in research productivity between female and male academics. Some studies reported gender disparity in research productivity in favour of male academics (Astegiano, Sebastian-Gonzalez & Castanho, 2019; Geber, 2009; Lone & Hussain 2017); some other reports showed that the female academics published more than male academics (Igiri, et. al, 2021), yet another report claim that there is no significant difference in research productivity of male and female academics (Oyeyemi, Ejakpovi, Oyeyemi & Adeniji, 2019). With respect to academics' disciplinary affiliation, Astegiano, Sebastian-Gonzalez and Castanho (2019) discovered that there were significant gender differences in research productivity especially in the science and technological based disciplines. The need to discover which of these claims is true representation of female academics in private universities in South-East Nigeria is important in evaluation of the success of the United Nations' Millennium Development Goal (MDGs) and Sustainable Development Goal (SDGs) in this regard. It is therefore expedient to comparatively examine the research productivity of male and female academics in private universities in South-East, Nigeria. Hence, the study sought to analyze male and female academics' research productivity in private universities in South-East, Nigeria and provide a scorecard of assessment for gender parity advocates.

Research Questions and Hypotheses

This study in the private universities in south-east, Nigeria, was guided by these research questions:

1. What are the research productivity scores of male and female academics in the selected universities?

At 0.05 level of significance, the following hypotheses were tested:

1. There is no significant difference in the mean research productivity scores of male and female academics in private universities situated in south-east, Nigeria.

Research Methodology

Ex post facto research design was adopted for the study. This study was conducted in the South-East zone of Nigeria. There are five states in the zone. The population for the study is 1,762 academics from 4 private universities in the zone. A multistage sampling procedure, which involved simple random sampling and proportionate stratified random sampling technique, was used to derive a sample of 223 academics from four private universities in two states in south-east, Nigeria. In the first stage, two states- Anambra and Enugu states were randomly drawn from the five south eastern states in Nigeria. The second stage involved sampling two private universities from each of the

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two states. The selected universities are: Madonna University and Paul University for Anambra state; and Godfrey Okoye University and Caritas University for Enugu state. The third stage involved using proportionate stratified sampling to draw 20% of academic staff from each of the four universities sampled. This resulted to 101, 26, 54 and 42 for the four universities respectively. This summed up to 223 academic staff sampled.

Data was collected using a researcher developed instrument titled Academic Staff Research Productivity Questionnaire (ASRPQ). The instrument covered eighteen forms of research output which include: text-books, book chapters, journal articles, monographs, occasional papers, conference proceedings, patent and certified inventions, technical reports and scientific and peer-reviewed bulletins that are published in the local and international sphere. This translates to eighteen forms of research output (nine local and nine international). An academic staff was required to indicate the number of single or co-authored works he/she published under the identified forms of research output. All the items of ASRPQ are structured on a five-point scale of None, 1-2, 3-4, 5-6, and 7 and above (as a range for the number of research output), and weighted 0, 1, 2, 3 and 4 respectively. The instrument was validated by three experts who are lecturers (one from the department of measurement and evaluation and the other two from the department of educational management and policy) in Faculty of Education of Nnamdi Azikiwe University, Awka. Cronbach Alpha was used in determining the reliability of the instrument, and a coefficient of 0.73 was obtained.

Computer-Assisted Personal Interviewing (CAPI) system (Google form) and manual administration of instrument were used to collect required data from academics. The link for the Google form (https://forms.gle/Rb7cLV7PJEaKd2NVA) was sent to both WhatsApp numbers and e-mail addresses of academics in the sampled universities. Out of the 223 copies of the questionnaire administered, 219 copies were properly responded to and successfully retrieved. Responses were obtained from 111 male academics (56 in science based disciplines and 55 in humanities based disciplines), and 109 female academics (54 in science based disciplines and 55 in humanities based disciplines). These copies were used for data analysis.

Mean scores of the responses of academics were used to answer the research questions while t-test was used to test the hypotheses at 0.05 level of significance. For the research questions, where the mean score is 2.00 and above indicating three or more research output, the academic's research productivity for that form of research output is acceptable, while where the mean score is less than 2.00 indicating less than three research output, the research productivity for that form of output was unacceptable. For the testing of the hypothesis, where the probability level is less than the significant level of 0.05 ($p<0.05$), the null hypothesis was not accepted, and where the probability level is greater than the significant level of 0.05, the null hypothesis was accepted. All analyses were done using version 20 of the Statistical Package for Social Sciences (SPSS).

II. RESULTS

The collected data were analyzed and the results presented in Tables according to the Research Questions and Hypotheses.

Research Question 1: What are the research productivity scores of male and female academics in the selected private universities?

Table 1: Mean research productivity scores of male and female academics in private universities in South-East, Nigeria.

s/no	Research Output/Publication		Males (N=111) Mean (x)	SD	Decision	Females (N=109) Mean (x)	SD	Decision
43	**Text books**	**Local**	0.38	0.523	Not accepted	0.33	0.609	Not accepted
		International	0.05	0.227	Not accepted	0.02	0.135	Not accepted
44	**Book chapters**	**Local**	0.59	0.803	Not accepted	0.40	0.783	Not accepted
		International	0.24	0.591	Not accepted	0.10	0.450	Not accepted
45	**Publication**	**Local**	1.00	1.111	Not accepted	0.76	1.062	Not accepted

	in journals	**International**	1.31	1.306	Not accepted	1.00	1.255	Not accepted
46	**Monographs**	**Local**	0.24	0.508	Not accepted	0.23	0.571	Not accepted
		International	0.04	0.187	Not accepted	0.04	0.189	Not accepted
47	**Occasional papers**	**Local**	0.44	0.759	Not accepted	0.41	0.772	Not accepted
		International	0.05	0.264	Not accepted	0.02	0.192	Not accepted
48	**Conference proceedings**	**Local**	0.92	0.926	Not accepted	0.69	0.857	Not accepted
		International	0.42	0.804	Not accepted	0.30	0.701	Not accepted
49	**Patent and certified invention**	**Local**	0.02	0.134	Not accepted	0.00	0.000	Not accepted
		International	0.00	0.000	Not accepted	0.00	0.000	Not accepted
50	**Technical reports**	**Local**	0.30	0.612	Not accepted	0.35	0.614	Not accepted
		International	0.11	0.390	Not accepted	0.06	0.329	Not accepted
51	**Scientific peer-reviewed bulletins**	**Local**	0.14	0.415	Not accepted	0.26	0.498	Not accepted
		International	0.06	0.279	Not accepted	0.06	0.281	Not accepted

Results on Table 1 reveal that out of 18 items representing the various forms of research output (nine local and nine international forms), none of the items had mean scores up to the cut-off mean score of 2.00 for both male and female academics in private universities indicating that on the average, within the three academic sessions 2016/2017 to 2018/2019, neither male nor female academics in private universities accepted being productive in any form of itemized research output. Male and female academics in private universities were however found to be most productive in international journal publications with mean-x=1.31, SD=1.306 and x=1.00, SD=1.255 for male and female academics respectively. Male and female academics in private universities were also found to be least productive in international patents and certified inventions, (x=0.00, SD=0.000 and x=0.00, SD=0.000).

Further analysis reveal that male academics in private universities scored higher than female academics in 13 items (seven local and six international forms of research output) namely: local and international textbooks, local and international book chapters, local and international journal publications, local monographs, local and international occasional papers, local and international conference proceedings, local patents and certified inventions, and international technical report. While female academics in private universities scored higher than male academics in two items (2 local forms of research output) namely: local technical reports and local scientific peer reviewed bulletins. Both male and female academics in private universities had same mean score for three items – international monographs 0.04, international patent and certified inventions 0.00, and international scientific peer reviewed bulletins 0.06.

From the analysis above, it can be concluded that within the three academic sessions under study, male and female academics in private universities had low research productivity being that on the average, these academics did not attain the mean cut-off score in any form of research output. However, male academics were found to have higher research productivity than female academics in private universities, having scored higher in 13 items while their counterparts scored higher only in two items.

Hypothesis One: There is no significant difference in the mean research productivity scores of male and female academics in public universities in South-East, Nigeria.

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Table 2: t-test comparison of mean research productivity scores of male and female academics in private universities in South-East, Nigeria.

s/no	Research Output/Publication		Male (N=111)		female (N=109)		t–value	df	Sig (2-tail) p value	Remark
			Mean	SD	Mean	SD				
43	**Text books**	Local	0.38	0.523	0.33	0.609	0.629	218	0.530	Not Significant
		international	0.05	0.227	0.02	0.135	1.421	179.552	0.157	Not Significant
44	**Book chapters**	Local	0.59	0.803	0.40	0.783	1.701	218	0.090	Not Significant
		international	0.24	0.591	0.10	0.450	2.011	205.360	0.046	Significant
45	**Publication in journals**	Local	1.00	1.111	0.76	1.062	1.627	218	0.105	Not Significant
		international	1.31	1.306	1.00	1.255	1.774	218	0.078	Not Significant
46	**Monographs**	Local	0.24	0.508	0.23	0.571	0.19	218	0.849	Not Significant
		international	0.04	0.187	0.04	0.189	-0.026	218	0.979	Not Significant
47	**Occasional papers**	Local	0.44	0.759	0.41	0.772	0.277	218	0.782	Not Significant
		international	0.05	0.264	0.02	0.192	1.149	200.732	0.252	Not Significant
48	**Conference proceedings**	Local	0.92	0.926	0.69	0.857	1.918	218	0.056	Not Significant
		international	0.42	0.804	0.30	0.701	1.186	218	0.237	Not Significant
49	**Patent and certified invention**	Local	0.02	0.134	0.00	0.000	1.421	110.000	0.158	Not Significant
		international	0.00	0.000	0.00	0.000	N/A	N/A	N/A	N/A
50	**Technical reports**	Local	0.30	0.612	0.35	0.614	-0.621	218	0.535	Not Significant
		international	0.11	0.390	0.06	0.329	1.092	213.173	0.276	Not Significant

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51	**Scientific peer-reviewed bulletins**	Local	0.14	0.415	0.26	0.498	-1.967	209.777	0.051	Not Significant
		internatio nal	0.06	0.279	0.06	0.281	-0.031	218	0.976	Not Significant

Table 2 displays the t-test comparison of the mean research productivity scores of male and female academics in private universities. The results on the said table revealed that there is no statistically significant difference between the mean research productivity scores of male and female academics in private universities in 16 items (nine local and seven international forms of research output) which had their probability values greater than 0.05 level of significance. These are namely: local and international textbooks, local book chapters, local and international journal publications, local and international monographs, local and international occasional papers, local and international conference proceedings, local patents and certified inventions and local and international technical reports, local and international scientific peer-reviewed bulletins. Thus the null hypotheses for these items were accepted.

The results further reveal that there exist statistically significant difference between the mean research productivity scores of the two groups of academics in one item – international book chapters, which had its probability value less than 0.05 level of significance. Thus the null hypothesis for the item was not accepted. Hypothesis was neither accepted nor rejected for international patents and certified inventions because the standard deviation for both groups is zero, according to the SPSS output.

From the analysis above, it is deduced that while male and female academics in private universities did not differ significantly in their mean research productivity scores in 16 forms of research output, there was statistically significant difference in their mean scores in one form of research productivity. It was therefore concluded that there is no significant difference between the mean research productivity scores of male and female academics in private universities in South-East, Nigeria. The hypothesis is therefore accepted.

III. DISCUSSION OF FINDINGS

Findings of this study revealed that the research productivity of both male and female academics in selected private universities in South-East, Nigeria is low, being that both male and female academics did not attain the mean cut off score in any form of research output. In fact, the findings revealed that within the session under study, both categories of academics had no international patent and certified inventions. This finding agrees with Okafor (2011); Kpolovie and Onoshagbegbe (2017); Igiri, et. al, (2021); and Uwizeye, et al. (2021) Mbachu and Unachukwu (2022a). Findings also revealed that male academics were generally more productive than female academics in more forms of research output. These findings concur with, Oloruntoba and Ajayi (2006); Lone and Hussain (2017); Astegiano, Sebastian, Gonzalez and Castanho (2019) and Mbachu and Unachukwu (2022b) submissions. Even though the male academics were more productive than their female counterparts in more forms (13 forms) of research output, interestingly, findings revealed that generally, with respect to local technical reports and local scientific peer reviewed bulletins female academics scored higher than their male counterparts. Private universities management may be instrumental in encouraging female academics in this regard. The demands placed on women as mothers may result to their inability to travel far away from their families for international research related activities. This may be a plausible cause for their low research output in international forms of research productivity. The advent of ICT related applications such as zoom meetings is expected to change the narrative.

In international patent and certified invention both categories of academics had no research output. This implies that both male and female academics have very low participation in inventing new products or producing innovative ideas and patenting their works globally. This agrees with the findings of Okiki (2013) whose study revealed that the research productivity of academics in Nigerian federal universities was least in patents and certified inventions.

Furthermore, findings also revealed the gender based difference in the research productivity of male and female academics was not significant in most forms of research productivity in private universities in South-East, Nigeria. This concurs with the findings of Tower, Plumer & Ridgewell (2007); and Oyeyemi, Ejakpovi, Oyeyemi and Adeniji (2019). This may imply that the management in private universities are making

efforts in encouraging female academics to be as productive in research as their male counterparts, and the gender parity goal is gradually being achieved. However, more still needs to be done to bridge the gender productivity gap.

IV. CONCLUSION

Based on the findings, this study concludes that there is gender bias in the research productivity of academics in private universities in South-East Nigeria. However, there seemed to be slight differences in research productivity of male and female academics in private universities, in favour of the male academics in more forms of research output, but the differences found were not significant in most forms of research output. Based on the findings, the researchers therefore recommend that;

1. The management of private universities should strive hard in motivating female researchers and innovators to produce their innovative ideas and patent their works. A positive research culture that encourages female academics to thrive in their research endeavours should be created in these private universities.
2. Female academics should also be encouraged to explore and utilize the ICT enabled means of communication such as zoom meetings, Google meet, among others, to publicize their research output especially in international research and knowledge related activities.

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