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# Gender Based Differences in Research Productivity of Academics in Public Universities in South-East, Nigeria

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Gender Parity, Research, Research Productivity, Academics, Public universities

## ABSTRACT

Research is germane in actualizing the goals of educational institutions. How well academics in universities participate in this task contributes significantly to the ranking of the universities. More so, the disparity or similarity of both gender types in this regard is important in ascertaining the actualization of sustainable development goal five and millennium development goal three. Using ex post facto design, the research examined the gender based differences in research productivity of academics in public owned universities situated in South-Eastern region of the country (Nigeria). Three research questions were employed in the study and three hypotheses were tested. From a population of 9,184 academics in 11 public universities, 896 academics were selected as the sample using the multistage sampling procedure which involved proportionate stratified sampling and simple random sampling, from four public universities in two states in the South-East zone of Nigeria, for the study. 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 0.732. The mean score was used to answer the research questions while independent samples t-test was used to test the hypothesis at 0.05 level of significance. The results revealed that out of the eighteen forms of research output investigated, female academics were more productive in research than their male counterparts in seven forms of research output while male academics were more productive than their female counterparts in nine forms of research output. Both gender types had the same mean score in two forms of research output. The test of the hypothesis also revealed an insignificant difference in research productivity of male and female academics in 12 forms of research output while a significant difference existed in six forms of research output. Based on the findings, it was recommended among others that the management of public universities should encourage female academics to explore and utilize international forms of research output to enhance their research productivity.

**Introduction**

The importance of research and publication of results in various forms of output (research productivity) cannot be over emphasized. A plenitude of studies have emphasized the importance of research productivity to higher educational institutions (Bassey, Akuegwu, Udida & Udey, 2007; Johnson & Louw, 2014; Okafor, 2011; Okpe, Simisaye & Otuza, 2013). Research productivity also provides a good platform for academics to become successful in academia (Iroaganachi & Izuagbe, 2018; Kpolovie & Onoshagbegbe, 2017; Okiki, 2013; Peretomode & Chukwuma, 2011; Yusuf, 2012) and enhances the development of a nation at large (Obibuaku, 2005; Onwujekwe, nd; Sulo, Kendagor, Kosgei, Tuitoek & Chelangat, 2012). Research productivity is a pertinent factor in ensuring favourable insti-

tutional prestige, world ranking and competitive standing of higher educational institutions globally. It constitutes the basis for appraisal and promotion of academics, and is also pivotal in securing academics' popularity in local and international academic circles. Research output also provides solutions to the problems faced by a nation, thus ensuring a comprehensive development of the nation.

Even though research productivity is indisputably important, scholars (Bassey, et. al, 2007; Igiri, Okoduwa, Akabuogu, Okoduwa, Enang, Idowu, Abdullahi, Onukak, Onuruka, Christopher, Salawu, Chris and Onyemachi, 2021; Okpe, et.al 2013; Uwizeye, Karimi, Thiong'o, Syonguvi, Ochienge, Kiroro, Gateri, Khisa & Wao, 2021; Yusuf, 2012) have observed that research productivity of academics in developing countries, including Nigeria, is abysmally low. This is evident in the results from various higher educational institutions' ranking bodies, such as the world webometrics ranking of Higher Educational Institutions (HEIs), where universities in developing countries recorded very low ranks. With respect to Nigerian universities, Kpolovie and Onoshagbegbe (2017) explained that such low ranks can be traced to low research productivity of academic staff in these universities. The necessity of research calls for active involvement of both male and female scholars to ensure efficient use of available research resources in order to enjoy its full benefits.

In academia, both the male and female academics are expected to be productive in their trifocal roles of teaching, research and community service. Remarkable innovations and technological advancements recorded in most western countries have been the products of rigorous research efforts of both male and female researchers. Yet, scholars such as Aina, Ogunlade, Ilesanmi and Afolabi (2015) have sadly complained that outstanding works of female scholars are most times less publicized when compared to their male counterparts.



Regardless of these benefits of the involvement of both male and female academics in research, scholars (Aina, Ogunlade, Ilesanmi & Afolabi, 2015; Casad, Franks, Garasky, Kittleman, Roesler, Hall, & Petzel, 2020; Korte & Lin, 2013; Zulu, 2013) have complained that an all-inclusive gender inequality gap still exist in academia, especially in most African countries in which Nigeria is inclusive. These envisaged that gender gaps exist in enrollment of students, staff recruitment, research productivity of academics, promotions and appointments of academics, among others. In fact, Collins and Steffen (2019) observed that female academics in certain departments have limited career-advancing opportunities due to limited exposure to social networks and low involvement in departmental decisions. Zulu (2013) corroborated this by explaining that women academics lacked mentors, role models, and access to national and international networks. Furthermore, Casad, et al. (2020), noted that most women do not have sufficient time for the conduct of research, and this negatively affects their chances of publishing, earning tenure, obtaining research grants, and advancing their careers. Besides the numerical strength favouring men, the 'tokenism' repute of the female gender in Nigerian educational institutions further aggravates their exposure to insignificant institutional support for female related issues, different sorts of abuses, among others (Aina, et al. 2015)

Impressively, educational institutions are also at the forefront in ensuring that the female folks actively participate in all spheres of development. 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. Tickle (2013) reported that during the 2013 British Council's Going Global Conference in Dubai, part of the demands made included the use of: availability of sufficient research project fund for female academics and inclusion of 'gender implications and impact' in criteria against which funding applications are assessed; the fundamental incor-

poration of diversity in all of a university's practices and procedures; and the creation of a global database on women and leadership in higher education, in monitoring its progress in each country. Hence, it is expected that management of public universities would favourably respond to the process of bridging this gap.

Studies have shown variations in research productivity between male and female academics. While some reported that the male academics published more than their female counterparts (Bassey, et. al., 2007; Geber, 2009; Tower, Plumer & Ridgewell, 2007); some other report shows 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, Tower, et. al (2007) discovered that there were no significant gender differences in productivity across the disciplines studied. Finding out which of these claims is true representation of female academics 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 examine in a comparative manner the research productivity of male and female academics in public universities in south-east, Nigeria. In this study, the aim was to examine the gender based differences in research productivity of academics in public universities in south-east, Nigeria.

**Research Questions and Hypotheses**

The study in the public 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?
2. What are the research productivity scores of male and female academics in science based disciplines in the selected universities?
3. What are the research productivity scores of male and female academics in humanities based disciplines 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 public universities situated in south-east, Nigeria.
2. There is no significant difference in the mean research productivity scores of female and male academics in science based disciplines in public universities situated in south-east, Nigeria.
3. There is no significant difference in the mean research productivity scores of male and female academics in humanities based disciplines in public universities situated in south-east, Nigeria.

**Research Methodology**

The 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 9,184 academics from 11 public 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 896 academics from four public 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 public universities from each of the two states. The selected universities are: Nnamdi Azikiwe University and Chukwuemeka Odimegwu Ojukwu University for Anambra state; and the University of Nigeria, Nsukka and Enugu State 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 244, 94, 414 and 144 for the four universities respectively. This summed up to 896 academic staff sampled.

Data was collected using a researcher developed instrument titled Academic Staff Research Productivity Questionnaire (ASRPQ) for the 2016/2017 to 2018/2019 academic sessions. The instrument covered eighteen forms of research output which include: textbooks, 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.

Both manual and Computer-Assisted Personal Interviewing (CAPI) system (Google form) 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 896 copies of the questionnaire administered, 888 copies were properly responded to and successfully retrieved. Responses were obtained from 444 male academics (224 in science based disciplines and 220 in humanities based disciplines), and 444 female academics (221 in science based disciplines and 223 in humanities based disciplines). These copies were used for data analysis.

Mean scores of the responses 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 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).

**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 universities?

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

| s/no | Research Output/Publication | | Males (N=444) | | Females (N=444) | |
|---|---|---|---|---|---|---|
| | | | Mean | SD | Mean | SD |
| 1 | **Text books** | **Local** | 0.27 | 0.528 | 0.35 | 0.619 |
| | | **International** | 0.11 | 0.364 | 0.12 | 0.368 |
| 2 | **Book chapters** | **Local** | 0.46 | 0.763 | 0.45 | 0.742 |
| | | **International** | 0.20 | 0.581 | 0.19 | 0.494 |
| 3 | **Publication in journals** | **Local** | 1.27 | 1.422 | 1.31 | 1.455 |
| | | **International** | 1.62 | 1.395 | 1.64 | 1.504 |
| 4 | **Monographs** | **Local** | 0.26 | 0.837 | 0.23 | 0.793 |
| | | **International** | 0.11 | 0.440 | 0.02 | 0.171 |
| 5 | **Occasional papers** | **Local** | 0.24 | 0.695 | 0.35 | 0.902 |
| | | **International** | 0.19 | 0.672 | 0.19 | 0.777 |
| 6 | **Conference proceedings** | **Local** | 1.07 | 1.145 | 1.10 | 1.296 |
| | | **International** | 0.91 | 1.211 | 0.48 | 0.944 |
| 7 | **Patent and certified invention** | **Local** | 0.01 | 0.116 | 0.01 | 0.082 |
| | | **International** | 0.02 | 0.141 | 0.00 | 0.048 |
| 8 | **Technical reports** | **Local** | 0.23 | 0.573 | 0.21 | 0.600 |
| | | **International** | 0.11 | 0.458 | 0.12 | 0.573 |
| 9 | **Scientific peer-reviewed bulletins** | **Local** | 0.16 | 0.615 | 0.07 | 0.305 |
| | | **International** | 0.16 | 0.488 | 0.06 | 0.262 |



Table 1 shows the mean research productivity scores of male and female academics in the selected universities. From Table 1, it was revealed that within three academic sessions 2016/2017 to 2018/2019, research productivity of male and female academics was low being that the mean cut-off score of 2.00 (three or more research publications in any form of research output) was not attained in any form of research output. Table 1 also shows that out of 18 forms of research output (nine local and nine international forms), male and female academics were both found to be most productive in international journal publications, (x=1.62 and x=1.64 for the male and female academics respectively). Male academics were found to be least productive in local patents and certified inventions (x=0.01), while female academics were least productive in international patent and certified inventions (x=0.00).

Further analysis reveals that the male academics scored higher than female academics in nine forms of research output (four local and five international forms) namely: local and international book chapters, local and international monographs, international conference proceedings, international patents and certified inventions, local technical report, local and international scientific peer reviewed bulletins. While female academics scored higher than male academics in seven items (four local and three international forms of research output) namely: local and international textbooks, local and international journal publications, local occasional

papers, local conference proceedings and international technical reports. Both male and female had the same mean score for two items – international occasional papers 0.19 and local patent and certified invention 0.01.

From the analysis above, it can be concluded that within the three academic sessions under study, male academics were found to have higher research productivity than female academics in public universities, having scored higher in nine forms of research output, while their counterparts (the female academics) scored higher in only seven forms of research output.

**Research Question 2:** What are the research productivity scores of female and male academics in science based disciplines in the selected universities?

***Table 2:*** *Mean research productivity scores of science-based male and female academics in public universities in South-East, Nigeria.*

| s/no | Research Output/Publication | | Males (N=224) | | Females (N=221) | |
|---|---|---|---|---|---|---|
| | | | Mean | SD | Mean | SD |
| 1 | **Text books** | **Local** | 0.22 | 0.55 | 0.29 | 0.61 |
| | | **International** | 0.03 | 0.29 | 0.09 | 0.28 |
| 2 | **Book chapters** | **Local** | 0.40 | 0.73 | 0.26 | 0.51 |
| | | **International** | 0.19 | 0.47 | 0.21 | 0.49 |
| 3 | **Publication in journals** | **Local** | 1.27 | 1.37 | 1.29 | 1.37 |
| | | **International** | 1.65 | 1.35 | 1.59 | 1.46 |
| 4 | **Monographs** | **Local** | 0.25 | 0.79 | 0.08 | 0.48 |
| | | **International** | 0.03 | 0.17 | 0.00 | 0.00 |
| 5 | **Occasional papers** | **Local** | 0.29 | 0.84 | 0.49 | 1.04 |
| | | **International** | 0.11 | 0.45 | 0.16 | 0.67 |
| 6 | **Conference proceedings** | **Local** | 1.03 | 0.96 | 1.32 | 1.38 |
| | | **International** | 0.79 | 1.01 | 0.50 | 0.90 |
| 7 | **Patent and certified invention** | **Local** | 0.02 | 0.14 | 0.01 | 0.11 |
| | | **International** | 0.02 | 0.16 | 0.00 | 0.06 |
| 8 | **Technical reports** | **Local** | 0.38 | 0.71 | 0.35 | 0.74 |
| | | **International** | 0.17 | 0.55 | 0.18 | 0.69 |
| 9 | **Scientific peer-reviewed bulletins** | **Local** | 0.19 | 0.59 | 0.10 | 0.40 |
| | | **International** | 0.21 | 0.44 | 0.09 | 0.33 |

Table 2 shows the mean research productivity scores of male and female academics in science based disciplines in selected universities. From Table 2, it was revealed that within three academic sessions 2016/2017 to 2018/2019, research productivity of science

based male and female academics was low being that the mean cut-off score of 2.00 (three or more research publications in any form of research output) was not attained in any form of research output.

Table 2 also revealed that within the three academic sessions under review, out of the 18 forms of research output (nine local and nine international forms) considered, both the male and female science based academics were found to be most productive in international journal article publications (x=1.65 and x=1.59 for science based male and female academics respectively). Science based male academics were found to be least productive in local and international patents and certified inventions (x=0.02), while science based female academics were least productive in international monographs and international patents and certified inventions (x=0.00).

Further probe reveals that science based male academics scored higher than their female counterpart in 10 forms of research output (five local and five international forms) namely: local book chapters, international journals, local and international monographs, international conference proceedings, local and international patents and certified inventions, local technical reports and local and international scientific and peer reviewed bulletins. While science based female academics scored higher than their male counterparts in eight forms of research output (four local and four international forms) namely: local and international text books, international book chapter, local journal articles, local and international occasional papers, local conference proceedings, and international technical reports.

From the analysis above, it can be concluded that within three academic sessions under review, science based male academics were found to have higher research productivity than their female counterparts, having scored higher in 10 forms of research output, while their female counterparts scored higher in only eight forms of research output.

**Research Question 3:** What are the research productivity scores of female and male academics in humanities based disciplines in the selected universities?

***Table 3:*** *Mean research productivity scores of humanities based female and male academics in the selected universities.*

| s/no | Research Output/Publication | | Males (N=220) | | Females (N=223) | |
|---|---|---|---|---|---|---|
| | | | Mean | SD | Mean | SD |
| 1 | **Text books** | **Local** | 0.31 | 0.49 | 0.40 | 0.62 |
| | | **International** | 0.18 | 0.41 | 0.14 | 0.43 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | **Book chapters** | **Local** | 0.51 | 0.79 | 0.63 | 0.87 |
| | | **International** | 0.21 | 0.67 | 0.16 | 0.49 |
| 3 | **Publication in journals** | **Local** | 1.25 | 1.47 | 1.31 | 1.53 |
| | | **International** | 1.59 | 1.43 | 1.68 | 1.54 |
| 4 | **Monographs** | **Local** | 0.27 | 0.88 | 0.37 | 0.98 |
| | | **International** | 0.19 | 0.58 | 0.03 | 0.23 |
| 5 | **Occasional papers** | **Local** | 0.19 | 0.49 | 0.19 | 0.70 |
| | | **International** | 0.26 | 0.83 | 0.21 | 0.87 |
| 6 | **Conference proceedings** | **Local** | 1.11 | 1.30 | 0.87 | 1.15 |
| | | **International** | 1.01 | 1.37 | 0.46 | 0.98 |
| 7 | **Patent and certified invention** | **Local** | 0.01 | 0.06 | 0.00 | 0.00 |
| | | **International** | 0.01 | 0.11 | 0.00 | 0.00 |
| 8 | **Technical reports** | **Local** | 0.08 | 0.32 | 0.06 | 0.36 |
| | | **International** | 0.04 | 0.32 | 0.06 | 0.40 |
| 9 | **Scientific peer-reviewed bulletins** | **Local** | 0.13 | 0.63 | 0.02 | 0.14 |
| | | **International** | 0.10 | 0.52 | 0.02 | 0.16 |



Table 3 provides shows the mean research productivity scores of female and male academics in humanities based disciplines in the selected universities. From Table 3, it was revealed that within three academic sessions 2016/2017 to 2018/2019, out of 18 forms of research output (nine local and nine international), humanities based male and female academics had low research productivity since the mean cut-off score of 2.00 (three or more numbers of research publication in any form of research output) was not attained in any form of research output. Male and female academics in humanities based disciplines were however found to be most productive in international journal publications (x=1.59 and x=1.68, for male and female humanities based academics respectively. Humanities based male academics were least productive in local and international patents and certified inventions (x=0.01), while humanities based female academics were also least productive in local and international patents and certified inventions (x=0.00).

Further analyses reveal that humanities based male academics scored higher than their female counterpart in 11 forms of research output (four local and seven international forms) namely: international textbooks, international book chapters, international monographs, international occasional papers, local and international conference papers, local and international patents and certified inventions, local technical reports, local and international scientific peer reviewed bulletins. Humanities based female academics

scored higher than their male counterparts in six forms of research output (four local and two international forms) namely: local text books, local book chapters, local and international journal publications, local monographs, and international technical reports. Both male and female humanities based academics however had the same score in local occasional papers (x=0.19).

From the above analyses, it can be concluded that within the academic sessions under review, humanities based male academics were found to have higher research productivity than their female counterparts in humanities based disciplines in public universities, having scored higher in 11 forms of research output, while their female counterparts scored higher in only six forms.

**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.

***Table 4:*** *t-test comparison of mean research productivity scores of male and female academics in public universities in South-East, Nigeria.*

| s/no | Research Output/Publication | | Male (N=444) | | Female (N=444) | | t–value | df | Sig (2-tail) P -value | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Mean | SD | Mean | SD | | | | |
| 1 | **Text books** | Local | 0.27 | 0.528 | 0.35 | 0.619 | -2.159 | 864.770 | 0.031 | Significant |
| | | international | 0.11 | 0.364 | 0.12 | 0.368 | -0.367 | 886 | 0.714 | Not Significant |
| 2 | **Book chapters** | Local | 0.46 | 0.763 | 0.45 | 0.742 | 0.134 | 886 | 0.894 | Not Significant |
| | | international | 0.20 | 0.581 | 0.19 | 0.494 | 0.373 | 886 | 0.709 | Not Significant |
| 3 | **Publication in journals** | Local | 1.27 | 1.422 | 1.31 | 1.455 | -0.397 | 886 | 0.692 | Not Significant |
| | | international | 1.62 | 1.395 | 1.64 | 1.504 | -0.162 | 881.022 | 0.871 | Not Significant |
| 4 | **Monographs** | Local | 0.26 | 0.837 | 0.23 | 0.793 | 0.618 | 886 | 0.537 | Not Significant |
| | | international | 0.11 | 0.440 | 0.02 | 0.171 | 4.227 | 573.467 | 0.000 | Significant |
| 5 | **Occasional papers** | Local | 0.24 | 0.695 | 0.35 | 0.902 | -1.917 | 831.624 | 0.056 | Not Significant |
| | | international | 0.19 | 0.672 | 0.19 | 0.777 | -0.092 | 886 | 0.926 | Not Significant |
| 6 | **Conference proceedings** | Local | 1.07 | 1.145 | 1.10 | 1.296 | -0.247 | 872.706 | 0.805 | Not Significant |
| | | international | 0.91 | 1.211 | 0.48 | 0.944 | 5.812 | 836.376 | 0.000 | Significant |
| 7 | **Patent and certified in-ventions** | Local | 0.01 | 0.116 | 0.01 | 0.082 | 1.005 | 798.849 | 0.315 | Not Significant |
| | | international | 0.02 | 0.141 | 0.00 | 0.048 | 2.551 | 541.987 | 0.011 | Significant |
| 8 | **Technical re-ports** | Local | 0.23 | 0.573 | 0.21 | 0.600 | 0.629 | 886 | 0.530 | Not Significant |
| | | international | 0.11 | 0.458 | 0.12 | 0.573 | -0.388 | 886 | 0.698 | Not Significant |
| 9 | **Scientific peer-reviewed bul-letins** | Local | 0.16 | 0.615 | 0.07 | 0.305 | 3.111 | 647.900 | 0.002 | Significant |
| | | international | 0.16 | 0.488 | 0.06 | 0.262 | 3.853 | 678.961 | 0.000 | Significant |

Table 4 displays the t-test comparison of the mean research productivity scores of male and female academics in public universities. The results reveal that out of the 18 items representing the various forms of research output (nine local and nine international

forms), there was no significant difference between the mean ratings of the two groups of academics in public universities in 12 items (seven local and five international forms of research output) which had their probability values greater than the 0.05 level of significance. These are: international textbooks, local and international book chapters, local and international journal publications, local monographs, local and international occasional papers, local conference proceedings, local patents and certified inventions and local and international technical reports. Thus the null hypotheses for these items were accepted.

The results further reveal that there is a significant difference between the mean scores of both groups of academics in the remaining six items (two local and four international forms of research output) which had their probability values less than the 0.05 level of significance. These are namely: local textbooks, international monographs, international conference proceedings, international patent and certified invention, local and international scientific peer reviewed bulletins. Thus the null hypotheses for these items were not accepted.

The analysis above reveal that while the difference in the mean ratings of research productivity of male and female academics in public universities was not significant for 12 out of the 18 forms of research output listed, it was significant in the remaining six items. It is therefore concluded that the mean research productivity scores of male and female academics in public universities do not differ significantly. The hypothesis is therefore accepted.

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



***Table 5:*** *t-test comparison of mean research productivity scores of science based male and female academics in public universities in South-East, Nigeria.*

| s/no | Research Output/Publication | | Male (N=224) | | Female (N=221) | | t–value | Df | Sig (2-tail) P –value | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Mean | SD | Mean | SD | | | | |
| 1 | **Text books** | Local | 0.22 | 0.55 | 0.29 | 0.61 | -1.361 | 437.783 | 0.174 | Not Significant |
| | | international | 0.03 | 0.29 | 0.09 | 0.28 | -2.163 | 442.992 | 0.031 | Significant |
| 2 | **Book chapters** | Local | 0.40 | 0.73 | 0.26 | 0.51 | 2.320 | 401.125 | 0.021 | Significant |
| | | international | 0.19 | 0.47 | 0.21 | 0.49 | -0.451 | 443 | 0.652 | Not Significant |
| 3 | **Publication in journals** | Local | 1.27 | 1.37 | 1.29 | 1.37 | -0.168 | 443 | 0.867 | Not Significant |
| | | international | 1.65 | 1.35 | 1.59 | 1.46 | 0.474 | 443 | 0.636 | Not Significant |
| 4 | **Monographs** | Local | 0.25 | 0.79 | 0.08 | 0.48 | 2.773 | 371.651 | 0.006 | Significant |
| | | international | 0.03 | 0.17 | 0.00 | 0.00 | 2.682 | 223.000 | 0.008 | Significant |
| 5 | **Occasional** | Local | 0.29 | 0.84 | 0.49 | 1.04 | -2.302 | 421.152 | 0.022 | Significant |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **papers** | international | 0.11 | 0.45 | 0.16 | 0.67 | -1.026 | 386.807 | 0.305 | Not Significant |
| 6 | **Conference proceedings** | Local | 1.03 | 0.96 | 1.32 | 1.38 | -2.512 | 392.914 | 0.012 | Significant |
| | | international | 0.79 | 1.01 | 0.50 | 0.90 | 3.208 | 443 | 0.001 | Significant |
| 7 | **Patent and certified invention** | Local | 0.02 | 0.14 | 0.01 | 0.11 | 0.693 | 443 | 0.489 | Not Significant |
| | | international | 0.02 | 0.16 | 0.00 | 0.06 | 1.899 | 298.670 | 0.058 | Not Significant |
| 8 | **Technical reports** | Local | 0.38 | 0.71 | 0.35 | 0.74 | 0.384 | 443 | 0.701 | Not Significant |
| | | international | 0.17 | 0.55 | 0.18 | 0.69 | -0.116 | 443 | 0.908 | Not Significant |
| 9 | **Scientific peer-reviewed bulletins** | Local | 0.19 | 0.59 | 0.10 | 0.40 | 1.825 | 390.978 | 0.069 | Not Significant |
| | | international | 0.21 | 0.44 | 0.09 | 0.33 | 3.447 | 412.009 | 0.001 | Significant |

Table 5 displays the t-test comparison of the mean research productivity scores of science based male and female academics in public universities. The results reveal that out of the 18 items representing the various forms of research output (nine local and nine international forms), there was no significant difference between the mean ratings of the two groups of science based academics in public universities in 10 items (representing five local and five international forms of research output) which had their probability values greater than the 0.05 level of significance. These are namely: local textbooks, international book chapters, local and international journal publications, international occasional papers, local and international patents and certified inventions, local and international technical reports, and local scientific peer reviewed bulletins. The null hypothesis with respect to these items was accepted

The results further reveal that there is significant difference between the mean scores of both groups of science based academics in the remaining eight items (four local and four international forms of research output) which had their probability values less than the 0.05 level of significance. These are namely: international textbooks, international book chapters, local and international monographs, local occasional papers, local and international conference proceedings, and international scientific peer reviewed bulletins. Thus the null hypothesis with respect to these items was not accepted.

The analysis above reveal that while the mean ratings of science based male and female academics in public universities was not significant for 10 out of the 18 forms of research output listed, it was significant in the remaining eight items. It is therefore concluded that the mean research productivity scores of science based male and female academics in public universities do not differ significantly. The hypothesis is therefore accepted.

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

***Table 6:*** *t-test comparison of mean research productivity scores of humanities based male and female academics in public universities in South-East, Nigeria.*

| s/no | Research Output/Publication | | Male (N=220) | | Female (N=223) | | t–value | df | Sig (2-tail) P -value | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Mean | SD | Mean | SD | | | | |
| 1 | **Text books** | Local | 0.31 | 0.49 | 0.40 | 0.62 | -1.684 | 422.282 | 0.093 | Not Significant |
| | | international | 0.18 | 0.41 | 0.14 | 0.43 | 1.067 | 441 | 0.286 | Not Significant |
| 2 | **Book chapters** | Local | 0.51 | 0.79 | 0.63 | 0.87 | -1.554 | 441 | 0.121 | Not Significant |
| | | international | 0.21 | 0.67 | 0.16 | 0.49 | 0.850 | 441 | 0.396 | Not Significant |
| 3 | **Publication in journals** | Local | 1.25 | 1.47 | 1.31 | 1.53 | -0.383 | 441 | 0.702 | Not Significant |
| | | international | 1.59 | 1.43 | 1.68 | 1.54 | -0.672 | 441 | 0.502 | Not Significant |
| 4 | **Monographs** | Local | 0.27 | 0.88 | 0.37 | 0.98 | -1.169 | 441 | 0.243 | Not Significant |
| | | international | 0.19 | 0.58 | 0.03 | 0.23 | 3.724 | 288.930 | 0.000 | Significant |
| 5 | **Occasional papers** | Local | 0.19 | 0.49 | 0.19 | 0.70 | -0.032 | 441 | 0.974 | Not Significant |
| | | international | 0.26 | 0.83 | 0.21 | 0.87 | 0.599 | 441 | 0.549 | Not Significant |
| 6 | **Conference proceedings** | Local | 1.11 | 1.30 | 0.87 | 1.15 | 2.083 | 433.729 | 0.038 | Significant |
| | | international | 1.01 | 1.37 | 0.46 | 0.98 | 4.890 | 395.137 | 0.000 | Significant |
| 7 | **Patent and certified invention** | Local | 0.01 | 0.06 | 0.00 | 0.00 | 1.000 | 219.000 | 0.318 | Not Significant |
| | | international | 0.01 | 0.11 | 0.00 | 0.00 | 1.740 | 219.000 | 0.083 | Not Significant |
| 8 | **Technical reports** | Local | 0.08 | 0.32 | 0.06 | 0.36 | 0.585 | 441 | 0.559 | Not Significant |
| | | international | 0.04 | 0.32 | 0.06 | 0.40 | -0.625 | 441 | 0.532 | Not Significant |
| 9 | **Scientific peer-reviewed bulletins** | Local | 0.13 | 0.63 | 0.02 | 0.14 | 2.598 | 242.642 | 0.010 | Significant |
| | | international | 0.10 | 0.52 | 0.02 | 0.16 | 1.983 | 260.278 | 0.048 | Significant |

Table 6 displays the t-test comparison of the mean research productivity scores of humanities based male and female academics in public universities. The results reveal that out of the 18 items representing the various forms of research output (nine local and nine international forms), there was no significant difference between the mean ratings of the two groups of humanities based academics in public universities in 13 forms of research output (seven local and six international forms) which had their probability values greater than the 0.05 level of significance. These are 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 patents and certified inventions, and local and international technical reports. The null hypothesis with respect to these items is accepted

The results further reveal that there is a significant difference between the mean scores of both groups of humanities based academics in the remaining five items (two local and three international forms of research output) which had their probability values less than the 0.05 level of significance. These are namely: international monographs, local and international conference proceedings, and local and international scientific peer reviewed bulletins. Thus the null hypothesis with respect to these items was not accepted.

The analysis above reveal that while the difference in the mean ratings of humanities based male and female academics in public universities was not significant for 13 out of the 18 forms of research output listed, it was significant in the remaining five items. It is therefore concluded that the mean research productivity scores of humanities based male and female academics in public universities do not differ significantly. The hypothesis is therefore accepted.

**Discussion of Findings**

Findings of this study revealed that the research productivity of both male and female academics in science based and humanities based disciplines is low, being that both category of academics did not attain the mean cut off score in any form of research output. This finding agrees with Okafor (2011); Okiki (2011); Kpolovie and Onoshagbegbe (2017); Igiri, et. al, (2021); and Uwizeye, et al. (2021). Findings also revealed that male academics were generally more productive than female academics even across academic disciplines in more forms of research output. These findings concur with, Oloruntoba and Ajayi (2006); Bassey, et. al. (2007); Geber (2009); and Tower, Plumer & Ridgewell (2007) submissions. Even though the male academics in both science and humanities based disciplines were more productive than their female counterparts in more forms of research output, impressively, findings revealed that generally, with respect to local and international textbooks; local and international journal articles as well as local conference proceedings (which constitute major forms of research output in most research productivity studies), female academics scored higher than their male counterparts. But with respect to their disciplinary affiliations, science based male academics scored higher than their female counterparts in international journals, while humanities based female academics scored higher than their male counterparts in both local and international journal publications. This contradicts the findings of Bassey, Akuegwu, Udida and Udey (2007) who reported that male academics published more journal articles than female academics. The plausible reason for this is that most of the female academics are in humanities based disciplines and may find it easier to publish textbooks and journal articles since research in their areas of specialization may not involve very rigorous and expensive activities, unlike the processes involved in science based disciplines which are male dominated disciplines. Public universities management may also be instrumental in encouraging female academics in this regard. In local conference proceedings, the female academics scored higher than their male counterparts while male academics scored higher than female academics in international conference proceedings. This may be as a result of the demands placed on women as mothers who may not want to be far away from their families. The advent of zoom meetings is expected to change the narrative.

In scientific and peer reviewed bulletins, patents and certified inventions, which may be more science related, male academics scored higher than their female counterparts. This may be because sciences disciplines are usually male dominated. Female academics had zero score for international patent and certified invention for both science-based and humanities-based disciplines. This implies that female academics have very low participation in inventing new products or producing innovative ideas and patenting their works. 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 that there was no significant difference in the research productivity between male and female academics, generally and across science-based and humanities-based disciplines in public universities in south east, Nigeria. This concurs with the findings of Tower, et. al (2007) and Oyeyemi, Ejakpovi, Oyeyemi and Adeniji (2019). This implies that managements in public 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; or the factors that affect the productivity of male academics also affects the female academics equally.

## Conclusion

From the findings, the study concludes that there is gender disparity in the research productivity of academics in public universities in South-East Nigeria. However, there seemed to be slight differences in research productivity of male and female academics in public universities, in favour of the male academics in more forms of research output, but the differences were found to be insignificant in most forms of research output. Based on the findings, the researchers therefore recommend that;

1. The management of public universities should strive hard in motivating female researchers and innovators to produce their innovative ideas and patent their works.

2. Female academics should also be encouraged to explore and utilize the ICT enabled means of communication such as zoom meetings, among others, to publicize their research output especially in international conferences.



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