A STUDY OF RESEARCH PRODUCTIVITY OF THE ACADEMIC STAFF IN RESEARCH INSTITUTES IN SOUTH-WEST NIGERIA

By

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Abstract

This study investigated research productivity of academic staff in research institutes in South-West Nigeria between 2009-2014. Descriptive research design was adopted, questionnaire was the data instrument used to collect data. Total enumeration method was used to capture 782 academic staff in the twelve (12) research institutes. Findings show that a total 15,477 research output was published by the academic staff and the level of research productivity of the academic staff is low ($(\bar{x} = 11.51; SD = 2.36)$*.Articles in journals had highest number with 3,486 (22.6%), followed by conference proceedings which had 2,364 (15.3%) of the publications. The patterns of research productivity of the academic staff in research institutes in South-West showed that majority 10,016 (64.7%) of the publications were published locally while 5,461 (35.3%) were published offshore (international outlets). The patterns further showed that majority 5,604 (36.2%) of the research productivity has single authorship, 5,216 (33.7%) while the remaining 4,657 (30.08%) were multiple authorship. Major factors hindering research productivity of academic staff in research institutes are family challenges, financial constraints, inadequate information accessibility, inadequate information literacy and inadequate motivation from employers. The study therefore recommends among other things: establishment of Special Research Trust Fund for development of the research in these institutes, adequate research funds/grants for academic staff, continuous training programmes on information literacy skills, mentoring, improved research skills of academic staff and encouragement of collaboration and interdisciplinary researches among the academic staff in the research institutes.*

Keywords: Research Productivity, Academic staff, Research institutes, Nigeria.

Introduction

Research plays significant role in developmental process of any every nation of the world, hardly could any nation develop without research and that is why nations systematically spend on research to bring desire quality of lives to their citizens. Research if well-coordinated in a country could bring revolutionary changes in the society and make lives more pleasant by bringing in desired development. Nations that are weak in research risk the intellectual erosion of their strength, lose their critical ability to assess claims to knowledge and such nation become dependent on outside for supply of knowledge (Wani, Pandit & Majeed, 2013) Nations that fail to invest wisely on research will definitely get it at higher cost from countries outside their boundaries as they will pay through their nose to get development.

In realisation of the pivotal roles of research in development, Nigeria, like any other nations that want development made certain efforts towards transforming her economy from less developed

to developing one. One of the efforts in making Nigeria developed is the establishment of research institutes in all the six geo- political zones in the country. The establishment of research institutes in Nigeria dated back to 1920s, during the colonial period when the British colonial government established agricultural research centres at Moor plantation, Ibadan, Umudike, Umuahia, Samaru and Zaria, where applied scientific research actually made its debut in the country as reported by Ekpe (1965). After Nigeria's independence, subsequent governments in the country established more research institutes in order to bring rapid development to the country. These research institutes are given specific mandates to be carrying out necessary research in agricultural, political, social, economic, scientific and technological issues that are germane to the development of the country.

One of the core missions of research institutions is to advance, create and disseminate knowledge through research and provide service to the community. Through research, research institutes contribute to innovation for mobilisation of resources in the country. However in many African countries including Nigeria, research is faced with numerous challenges (Njuguna & Itegi, 2013). These includes research capacity financial constraints, other resources (physical development of research institutions) research and policy, relevance publication of findings, social, political and cultural context in which research processes occur, as well as information technology.

It is also very important for every research outfit to show appreciable levels of research productivity, this is an indication of its trends, contribution to development and researchers' preferences for publication outputs. Print and Hattie (1997) defined research productivity as '*the totality of research performed by academics in universities and related contents within a given time period*' (p.454), Williams (2003) noted that research productivity could be defined as research product and research effort of which researcher produces. Research productivity in this study means the publications published by academic staff in the research institutes surveyed: such publications include books, journal articles, chapters in books, conference papers and proceedings, technical reports, patents, scientific peer- review bulletin, occasional papers, monographs, co-authored books, theses/dissertations and Journal publications published.

In order to achieve given mandates, research institutes in South-West Nigeria employed personnel, which of course include researchers who undertake researches relating to the mandates given to various institutes. By virtue of the nature of these institutes, the researchers are line staff and as such very important for the attainment of the objectives of these institutes. In addition, the

researchers are regarded as academic staff as they belong to Academic Staff Union of Nigerian Research Institutes, which is an umbrella labour union of all the academic staff in research institutes in Nigeria. The academic staff members also include Librarians that work in these institutes. According to the Scheme of Service in the Federal Civil Service of Nigeria published by the Office of Head of Service of the Federation, researchers and librarians are categorised as academic staff members (Federal Republic of Nigeria, 2000)

Research productivity is very important in the appointment and promotion of academic staff of these institutes as it is spelt out in the schemes of service governing their appointments and promotions. By virtue of their work and positions, apart from educational qualifications and cognate experience, they are required to get appointments and promotions on evidence of satisfying research publications in reputable journals, conference proceedings and seminar papers. The numbers of publications vary with different academic positions in the research institutes and possession of Ph.D. in relevant field is a prerequisite for appointment of Principal Research Officer in these research institutes (Federal Republic of Nigeria, 2000). The importance of research productivity in the career advancement and prestige of researchers in these institutes is quite obvious as such it is not taken with levity by academic staff and employers, so the popular saying that "publish or perish ''that is said in academics is also practised in the research institutes in the South-West, Nigeria.

Research provides a good platform for academic staff members to become successful academics. This is because research develops academic knowledge and reinforces the skills needed for effective knowledge. Yusuf (2012) however observed that both the quantity and quality of research output from these institutions in Nigeria are generally too low to make the desired impact on national development. Worse still, there is a general lack of research focus by the higher education sector in relation to Nigeria's national Research & Development needs.

This research was carried out in the South -West geopolitical zone of Nigeria. It is one of the six (6) geographical zones in Nigeria. Other geo-political areas include South–South, North-East, North-West, North Central, and South East. There are six (6) states namely: Ogun, Oyo, Lagos, Osun, Ondo and Ekiti State in this zone. The zone plays host to twelve research institutes covered in this study. The research institutes are situated in Lagos, Oyo and Ondo States in the zone. The zone is populated by Yoruba speaking people of Nigeria, one of the major three (3) tribes in Nigeria.

Statement of the Problem

It is obvious that research productivity is germane to prestige and career progression of academic staff in the research institutes in South-West, Nigeria. In spite of the relevance of research productivity, it is observed that the level of research productivity of academic staff in Nigeria, including academic staff in research institutes is abysmally low. This undesirable situation has been observed with great concern by the researcher and this assertion was corroborated by Onilude & Apampa (2010); (Yusuf, 2012). Okebukola and Solowu (2001) The observed low research productivity level, no doubt would have been affecting prestige and career advancement of academic staff in the research institutes in South-West Nigeria negatively. The literature search conducted by the researcher showed that this type of study has not been carried on the academic staff of the research institutes in South- West Nigeria in recent time, hence the need for this research.

Research Questions

The broad objective of this research is to investigate research productivity of academic staff in the selected research institutes in South-West Nigeria between 2009- 2104. This study is guided by the following research questions:

1. What is the total of research productivity of academic staff in the selected research institutes in the South- West Nigeria?
2. What is the level of research productivity of academic staff in the selected research institutes in South-West Nigeria?
3. What is the authorship pattern of the research productivity of academic staff in the research institutes surveyed in South-West Nigeria?
4. What is the pattern of local and international publications of the academic staff in the selected research institutes in South-West Nigeria.?
5. What are the factors that hinder research productivity of academic staff in the selected research institutes in South -West Nigeria?
6. What could be recommended in improving research productivity of the academic staff in the research institutes in South-West Nigeria?

Literature Review

The use of publications as an index of productivity is acknowledged and upheld by the literature. At the same time, publications are reflection of the research commitment and the principal means through which result are made known to the scientific community [5-9]

Research publications in any field of specialisation provide current information for growth, progress, development and improved society. Research productivity is very critical to academic staff worldwide. Decision regarding tenure and promotion for individual academic members are frequently linked to scholarly achievement. Prestige of programmes and institutions often is built on the scholarly accomplishments of their academic staff (Kaufman & Chevan, 2011) Academic researchers publish to establish their claim to a specific result at specific result at a specific time. When researchers publish their academic works, it is an avenue for their peers to access their research and communicate with other colleagues interested in a similar subject area.

Scientific productivity has been matters of enquiry since the pioneering work of Lotka (1926). The literature is replete with narratives and descriptions of the resources and structures available to support the research success of academic staff. Common supports include writing support groups (Campbell, Ellis & Adebonojo, 2012; Exner & Harris Houk, 2010; Fallon, 2012; Tysick & Babb, 2006), journal clubs (Fitzgibbons, Kloda, & Miller-Nesbitt, 2017), support groups or forums for research conversations (Carson, Colosimo, Lake, & McMillan, 2014; Hall & McBain, 2014; Miller & Benefiel, 1998; Sapon-White, King & Christie, 2004), mentorship programs (Cirasella & Smale, 2011; Stephens, Sare, Kimball, Foster, & Kitchens, 2011), research skills development initiatives (Edwards, Jennerich, & Ward, 2009; Jacobs & Berg, 2013; McBain, Hall, & Culshaw, 2013; Schrader, Shiri, & Williamson, 2012), research leaves or release time, and funding (Smigielski, Laning, & Daniels, 2014).

Hadjinicola and Soteriou (2006) studied factors that promote research productivity of production and operations management (POM) groups of researchers in US business schools. The paper also investigated factors that affect research quality, as measured by the number of articles published per POM professor in journals, which have been recognized in the POM literature as an elite set. The results revealed that three factors increase both the research productivity and the quality of the articles published by professors of a POM group. These factors are (a) the presence of a POM research centre, (b) funding received from external sources for research purposes, and (c) better library facilities.

Paul, Vijayakaravan, Singh & Burman (2013) investigated research productivity of agricultural scientists in high performing and low performing institutes in India. The sample of the study comprised of randomly drawn two hundred agricultural scientists. The researchers developed

a research productivity index to measure the research productivity of the agricultural scientists. The study among other things revealed that there is ample scope of enhancing research productivity among the scientists as the majority (63.5%) had low to very low level of productivity. The findings further indicated the crucial need for revisiting the system of career advancement for principal scientists and senior scientists as the t-test failed to produce significant value of productivity difference between the principal scientists and senior scientists.

Gregorutti (2010) submitted that academic staff affirmed their motivations and interest for producing research with several that can be grouped under the theme of the need for publishing (including intellectual growth, knowledge and societal improvements. To refresh and enhance teaching. Professional prestige within and outside the university), besides, research is increasingly seen as one of the main missions for higher education institution, including research institutes (Fairweather & Beach, 2002)

Many studies have been carried out on research productivity of various research institutions. Vasishta (2011) investigated the contribution and impact research output on PEC University of technology as reflected in its publications covered in Scopus international multidisciplinary database and described broad characteristics of research publications of PEC during 1990-2009. She concludes that in all 177 research papers were published during the period by the departments of the PEC, showing an average of growth rate of 131.85%. Okafor and Dike (2010) analysed the research output of academics in the science and engineering faculties of Federal Government owned universities in Nigeria. It was found out that 30.6% of the academics published between 0-4 journals articles, thatonly2-7% of them published 30 or more articles during the period and as 42.1% did not have any article in overseas journals. Similarly, Jain and Gupta (2011) investigated research productivity of Indian scientists contributing to world soybean research for the period 1989- 2009 based on the data available in the International Crop CD database. They concludes that Indian scientists contributing to world soybean research, have higher publication output as Indian was rated 2nd in rank, just after United States of America that has 13.64% of the world publication on soybean.

Vellaichamy and Jeyshankar (2015) evaluated the publication pattern of Pondicherry University based on the data collected from Scopus database over a period of twenty seven years from 1987-2013. The study shows that majority (84.8%) of the researchers preferred to their research papers are joint authorship and the degree of collaboration ranges varies from 0.61 to 0.96 and its

mean value 0.88. The study also analysed that Physics and Astronomy which produces more number of papers while the multi-authorship also possesses a lead role in this subject.

Jeyshankar (2015) evaluated the research publication trend among scientists of Indira Gandhi Centre for Atomic Research during the period 1989-2013. Data were analyzed based on type of publication, year of publication, language, source, country, institutions, most preferred journals and most prolific authors among other variables. The study revealed that majority (96.26%) of the researchers preferred to publish their research papers in joint authorship only and the degree of author collaboration ranges from 0.84 to 0.99 and its mean value is 0.95. It also revealed that IGCAR scientists preferred to publish their work in the Journal of Nuclear Materials and Transactions of the Indian Institute of Metals.

Kobio (2006) reported that while research productivity in terms of articles in the rest of the world is increasing fast, the relative position of Africans countries as knowledge is decreasing gradually. Sub Saharan Africans contribute around 0.7% of world scientific output and this figure has decreased over the last 15-20 years. Kobio affirmed that except for South Africa lack of incentives to publish was also a problem. He lamented that most of the research conducted in African countries to gather dust in rooms in many universities and research institutions while many researchers are forced to seek publication in foreign journals.

Publishing in foreign journals is often a slow and frustrating experience and even when such material is accepted for publication the information is not readily accessible to local researchers, professionals or communities who need it most. This has resulted to lack of locally published books in research and other professional areas and as such African continent continue to experience'' book famine'' as locally published books and journals are very few in various disciplines.(Kobio, 2006)

A study by Centre for Higher Education Transformation (CHIET) (2011) concluded that the knowledge of the academics scores production flagship African universities is not strong enough to enable universities to make a sustainable contribution to development. The challenges of research in Africa are not purely academic. They are caused by failure of the governments to put in place policies that recognize the fundamental impact research activities could have on governance and efficient use of public resources. Consequently, research has been accorded insufficient attention and resources by governments and institutions of higher education. (Njuguna & Itege, 2013)

There are also numerous articles which describe the level, context, and environment in which librarians conduct their research and scholarship (Harrington & Gerolami, 2014; Pickton, 2016; Shaw & Szwajcer, 2016). Much of the research to date has focused on institutional context. Within these articles, authors often address the challenges that librarians face when conducting research and the barriers that may prevent them from being productive researchers. Commonly noted challenges and barriers include time constraints, lack of support, and lack of research training or experience. (Brown, 2001; Fox, 2007; Kennedy & Brancolini, 2012; Lessick et al., 2016; O'Brien & Cronin, 2016; Powell, Baker & Mika, 2002; Shaw & Szwajcer, 2016; Spring, Doherty, Boyes, & Wilshaw, 2014).

Methodology

Descriptive survey research design was adopted for this study. The population of the study is seven hundred and eighty-two (782) academic staff of research institutes in South-West, Nigeria. This includes all 746 Research fellows and 36 academic librarians in the selected twelve (12) research institutes in South-West, Nigeria. The fields of specializations of these institutes are agriculture, Socio- economic, Science and Technology, Legal, Industrial, Planning and Administration and Foreign affairs research. All the institutes covered in this study are established and funded by the Federal Government of Nigeria with exception of International Institutes for Tropical Agriculture (I.I.T.A). Total enumeration technique was adopted for this study; this is because the total population of 782 academic staff in the twelve (12) research institutes is not too large.

The research productivity scale developed by Popoola (2008) with test-retest reliability coefficient ($\alpha = 0.72$) was used after revalidation and test –retest method of reliability coefficient of 0.78 to determine research productivity of the academic staff. The instrument with 0.75 reliability coefficient has also been used by Okiki (2013). Questions enquired from academic staff surveyed include the quantity and pattern of research productivity in terms of publications they have in forms of books, journal articles, monographs ,Chapters in books, Collaborated works, Occasional papers, technical reports, scientific peer-reviewed, Conference proceedings, Patent and certified invention. The researcher and the research assistants paid several visits to these institutes for the distribution, monitoring and retrieval of the questionnaire. A total of 782 copies of questionnaire were distributed and 610 returned copies that were useful were analysed.

Results

Research Question1: What is the total of the research productivity of the academic staff in the selected research institutes in South- West Nigeria?

Table 1: Total Research Productivity of Academic staff in Research institutes in South-West, Nigeria (2000-2014).

Research Productivity	Total	%
Articles in journals	3486	22.6
Conference Proceedings	2364	15.3
Chapters in books	1458	9.4
Technical Reports	1347	8.7
Co-authored textbooks	1290	8.3
Scientific peer-reviewed bulletin	1170	7.5
Textbooks	1197	7.7
Occasional papers	1098	7.1
Thesis/dissertation	798	5.2
Monographs	831	5.4
Patents	438	2.8
TOTAL	15,477	100

Table 1 shows the total number of research output of academic staff in the research institutes in the South-West, Nigeria. A total of 15,477 publications were produced by the academic staff of the research institutes. As shown in the table, articles in journals had the largest number with 3,486(22.6%),conference proceedings came next with 2,364 (15.3%) publications, Chapters in books made up of 1,458(9.4%), Technical reports came next with 1,347(8.7%), Co-authored textbooks were 1,290(8.3%), Textbooks had 1197(7.7%) of the publications, Scientific peer-reviewed bulletin were 1,170(7.5%), Occasional papers constituted about 1,098(7.1%), Thesis/dissertations were798(5.2%), Monograph were just 831(5.4%)while Patents were 438(2.8%) of the local publications of the respondents.

Research Question 2: What is the level of research productivity of academic staff in research institutes in South-West, Nigeria?

Table 2: Level of research productivity of academic staff in research institutes in South-West, Nigeria

RESEARCH INSTITUTES	RESEARCH PRODUCTIVITY	
	$\bar{x}$ (Mean)	SD
NIOM	10.13	1.73
CRIN	10.14	1.77
IAR &T	10.23	1.74
FIIRO	9.90	1.68
NISER	10.78	2.30
NIAL	10.42	1.79
IITA	10.50	1.94
FORIN	11.10	2.54
NIHORT	10.32	2.03
NIMR	10.37	2.13
NIIA	10.14	1.78
NIEPA	10.64	2.23
Overall $\bar{x}$ SD	11.51	2.36

Table 2 shows the level of research productivity of academic staff of research institutes in South-West, Nigeria. The level of research productivity of the academic staff was revealed when the mean and standard deviation of research productivity of the academic staff were calculated on the basis of research institutes and the overall mean and standard deviation calculated thereafter as shown in the table. The results showed that the level of research productivity is low. The research productivity level of academic staff in individual research institutes is relatively low, the highest level of research productivity was in Forest Research Institutes (FORIN) with ($\bar{x}$=11.10; SD=2.54), this was followed by Nigerian Institute for Social and Economic Research (NISER) with $\bar{x}$=10.78) and Nigerian Institute of Education and Administration (NEIPA). The inference that could be drawn from this finding is that the level of research productivity of academic staff is relatively high in

FORIN($\bar{x}$ =11.10) as NISER has ($\bar{x}$=10.78) and NEIPA($\bar{x}$ =10.64) while in NIOM($\bar{x}$ =10.13), FIIRO($\bar{x}$ =9.90), CRIN($\bar{x}$ =10.14), NIIA($\bar{x}$ =10.14), NIMR($\bar{x}$ =10.37), NIHORT($\bar{x}$= 10.32) IITA($\bar{x}$ =10.50), NIAL($\bar{x}$ =10.42), NIOM($\bar{x}$ =10.13), IAR &T($\bar{x}$ =10.23) were revealed. In the overall assessment, the level of research productivity of academic staff in the research institutes is low as the overall mean score and standard deviation ($\bar{\boldsymbol{x}} = 11.51; \boldsymbol{SD} = 2.36$) is considered low.

Research Question 3: What is the authorship pattern of the research productivity of academic staff in the research institutes surveyed in South-West Nigeria?

Table 4: Authorship pattern of the research productivity of academic staff in the research institutes surveyed in South-West Nigeria

Research Productivity	Single Authorship	% N=5604	Joint Authorship	(%) N=5216	Multiple Authorship	(%) N=4657	Total
Articles in journals	1711	(30.5%)	990	(19%)	1101	(23.6%)	3486
Conference Proceedings	840	(14.98%)	720	(13.8%)	864	(18.6%)	2364
Chapters in books	752	(13.4%)	564	(10.8%)	282	(6.0%)	1458
Thesis/dissertation	573	(10.2%)	153	(2.9%)	72	(1.5. %)	798
Technical Reports	369	(6.6%)	552	(10.9%)	426	(9.1%)	1347
Text Books	475	(8.8%)	402	(7.7%)	375	(8.05%)	1197
Scientific peer-reviewed bulletin	-	-	375	(7.2%)	440	(9.4%)	1170
Occasional papers	411	(7.3%)	336	(6.4%)	351	(7.5%)	1098
Monographs	291	(5.2%)	290	(5.6%)	250	(5.4%)	831
Patents	182	(3.2%)	90	(1.7%)	166	(3.5%)	438
Co-authored textbooks	-	-	744	(14.3%)	330	7.08%)	1290
TOTAL	5,604	(100%)	5,216	(100%)	4,657	(100%)	15,477

Table 3 shows the authorship patterns of the research productivity of the academic staff in research institutes in South-West, Nigeria. Total research productivity of the academic staff in the research institutes surveyed is 15, 477, out of this, 5.604 (36.2) publications were single authorship. Out of this, journals articles constituted the largest chunk with 1,711 (30.5%), followed by conference

proceedings (14.98%), chapters in books (13.4%), Thesis/dissertations(10.2%), technical reports (6.6%), textbooks (7.5%), scientific peer-renewed bulleting (6.3%), occasional papers (7.3%), monographs (5.2%) co-authored textbooks (3.9%) while patents constituted only (3.2%) of the total single authorship publications of the academic staff. In addition, 5,216 (33.7%) of the total publications were published by joint authors.

The results further revealed that out of this, articles in journals also had the highest with 990 (19%), co-authored textbooks accounted for 744(14.3%) followed by conference proceedings with about 720(13.8%); chapters in books had 564 (10.8%) of the joint authorship publications, technical report (10.9%), textbooks 402(7.7%); scientific peer-reviewed bulletin 375(7.2%) occasional papers 336 (6.4%) , monographs 290 (5.6%) co-authored (3.9%). Patents were about (1.7%) and thesis/dissertation had the least with about (1.5%) of the joint authorship. In respect of multiple authorship, the pattern shows that 4,657 (30.08%) were of multiple authorship. Out of this, articles in journals were 1101 (23.6%), followed by conference proceedings 864 (18.6%), scientific peer-reviewed bulleting came next with about 440(9.4%), technical report 426 (9.1%), textbooks 375 (8.05%), co-authored 330(7.8%),occasional papers 351 (7.5%), monographs 250(5.4%) while patents were just 116 (3.5%)of the multiple authorship publications of the academic staff in the research institutes in South-West, Nigeria.

What is the pattern of local and international publications of the academic staff in the selected research institutes in South-West Nigeria?

Table 4: Pattern of Research Productivity of Academic Staff in Research Institutes by Types in Local and International Publications

Research Productivity	Local Publication	%	International Publication	%	Total
Articles in journals	2034	(20.6%)	1452	(25.9%)	3486
Conference Proceedings	1536	(15.5%)	828	(14.8%)	2199
Chapters in books	972	(9.8%)	486	(8.7%)	1458
Technical Reports	936	(9.5%)	411	(7.3%)	1317
Co-authored textbooks	894	(9%)	396	(7.1%)	1290
Scientific peer-reviewed bulletin	792	(8%)	378	(6.8%)	1170

Occasional papers	615	(6.2%)	483	(8.6%)	1098
Thesis/dissertation	609	(6.2%)	189	(3.4%)	798
Monographs	456	(4.6%)	375	(6.7%)	831
Patents	192	(1.9%)	246	(4.5%)	438
TOTAL	9882	100%	5595	100%	15477

Table 4 shows the level of research productivity of academic staff in research institutes in South-West, Nigeria. The results showed that the academic staff in research institutes had the highest numbers of research productivity in articles in journals 2034 (20.6%) and Conference Proceedings 1536(15.5%) for local publication and also article in journals 1452(25.9%) for international journal. The level of research productivity tend to be low for chapters in books 972(9.8%); 486(8.7%); technical Reports 936(9.5%); 411(7.3%); co-authored textbooks 894(9%); 396 (7.1%); scientific peer-reviewed bulletin 792(8%); 378(6.8%); Occasional papers 615 (6.2%); 483 (8.6%); Thesis/dissertation 609 (6.2%); 189 (3.4%); Monographs 456 (4.6%); 375 (6.7%) and 192 (1.9%); 246 (4.5%) for both local and international publication respectively.

Research Question 5: What are the factors hindering research productivity of academic staff of research institutes in the South-West, Nigeria?

Table 5: Factors hindering research productivity of academic staff in research institutes in South-West, Nigeria

Challenges	Frequency	%(N=610)
Family challenges	525	86.1
Financial constraints	524	85.9
Inadequate information accessibility	507	83.1
Inadequate information literacy skills to use information resources	504	82.6
Inadequate motivation from employer	462	75.7
Inadequate research skills(e.g. statistical, data analysis)	446	73.1
Too much administrative duties	418	68.5

Infrastructural inadequacy	417	68.4
Inadequate research grant	389	63.8
Inadequate mentoring	370	60.7
Inadequate training	319	52.3
Inadequate information resources in the library	270	44.3

Table 5 shows the factors hindering research productivity of academic staff of research institutes in the South-West, Nigeria. The results indicated that, family challenges 525(86.1%), financial constraints 524 (85.9%), inadequate information accessibility 507(83.1%); Inadequate information literacy to use resources 504 (82.6%); inadequate motivation from employer; and inadequate research skills 446(73.1%) constitute the main challenges hindering research productivity of academic staff of the research institutes. Other challenges include: too much administrative duties 418(68.5%); infrastructural inadequacy 417 (68.4%); inadequate research grant 389(63.8%); inadequate mentoring 319(52.3%) and inadequate information resources in the library 270(44.3%).

Discussion of the findings

The total of research productivity of academic staff in the research institutes in South-West, Nigeria between (2009-2014) is put at 15,477 publications which comprised of articles in journals, conference proceedings, chapters in books, technical reports, co-authored textbook, scientific peer-renewed bulletin, textbooks, occasional papers, Thesis/dissertation, monographs and patents. The level of research productivity is low for the period of six years period covered when one considers the total number of 610 academic staff members of the twelve (12) research institutes in the South-West, Nigeria that constituted the number of academic staff surveyed publishing total of 15,477 research output.

The level of research productivity is low. This low level of research productivity of academics staff found out in this study is consistent with the submission of Yusuf (2012). Bassey, Akuegwu, Udida & Udey (2007) also made similar observation regarding the low research productivity academic staff in Nigeria. This finding was also attested to the revelation made by Task force on Higher Education (2000) that Nigeria's number of scientific publications for 1995 was 711 – significantly less than its output of 1,062 scientific publications in 1981 by a comparatively much smaller university system in the world. Similarly, report released by the University World News

(2013) on the proportion of publications from Nigeria in comparison with other African countries also corroborated the low level of research productivity in Nigeria. The country's low research output probably reflects the low priority accorded to research and development by government and decision-makers in Nigeria.

The findings showed that journal articles and conference proceedings constitute greater part of research productivity of the research institutes in South-West, Nigeria. This is probably attributed to the fact that journal articles are giving more importance by academic staff as reported by Field and Gibbons (1991); Kadhakrishma and Jackson (1993). This finding is also consistent with findings of RadhaKrishna etal.(2001) that journal articles are the first formal presentations to the scientific community of innovations or discoveries. Journal articles and conference proceedings are the best source for the most current state-of-art literature in any discipline and as such more importance were giving to journal articles and conference proceedings. It is also worthy to note that that one of the criteria for promotion of researchers and academics is the number of such articles published. Similarly, this assertion was also expressed by Kotrlik etal. (2002); Radhakrishna etal (1994) also concluded that publications refereed articles in journal and paper presentations in conferences) are considered to be a very important component of academic staff research productivity. Clement & Stevens (2009) affirmed this when they asserted that importance attached to journal articles was as result of substantial points awarded to it in promotion of academic staff. Research scholarship especially in peer-reviewed publication, seems essential to success of an academic staff member (O'Mearar, 2005) Radhakrighna & Jackson (1993) also reported that publishing in refereed journals is ranked as the most important factor when agricultural and extension education department heads were asked to rank the importance of 13 factors in the evaluation of faculty. All these reasons might substantiate why journal articles and conference proceedings constituted substantial parts of publications of the academic staff of the research institutes in South-West, Nigeria.

The patterns of research productivity revealed that majority of the publications were published locally in Nigeria. This could be attributed to the fact that academic staff members were based in Nigeria. This could also be said to be good for the country as their publications could be relatively available and accessible to Nigerian readership and as such make the findings of their research useful in Nigeria by policy makers, organisations and Nigerian society at large.

Another probably reason for lower percentage of international publication could be the high rate of rejection of scholarly articles written by authors from developing countries including Nigeria

in the hands of foreign publishing outlets. The high rate of rejection makes it extremely difficult for Nigerians academics to get their research published in foreign outlets. This assertion is similar with the findings of Okafor (2011) as he found out that the mean publication in local journals in the comparative study of research output of Federal universities in Southern Nigeria was 5.07 and that of articles in international journals was 2.63. Okafor attributed this pattern to the notion that Nigerian academics find it difficult to publish in international journal due to high rejection of articles. This finding was again supported by the submission of Alemna (1996) when he said that it was not always easy to publish in foreign journals because much of the research in Nigeria address local issues which are not likely to interest an overseas audience. Similarly, Omolewa (2008) lamented that many of the professors in Africa including Nigeria are only local professors who are hardly known outside their institutions and are not recognised for the quality of their knowledge or scholarship as they hardly published in reputable publishing outlets.

Authorship is one aspect that plays a great role in information dissemination and communication. Authors' contribution to the field of knowledge could be viewed from different patterns, such as single authorship, joint authorship and multiple authorship (Aliyu, 2011) Based on the assertion of Aliyu, this study also investigated the authorship patterns of the research productivity of the academic staff in research institutes in South-West, Nigeria. This is done in order to show the extent of collaborations of the academic staff of the research institutes surveyed, this is important as eight (8) out of twelve (12) of research institutes covered in this study are science oriented and collaboration is said to be very common practice among scientists and researchers as observed by Subramanyam, 2007).

The results showed that out of the total research productivity of the academic staff in the research institutes surveyed, 5,604 (36.2%) publications were singled authorship. 5,216 (33.7%) of the total publications were published by joint authors while the total of 4,657 (30.08%) were of multiple authorship. Even though, the study revealed that majority of the publications were single authorship, there are some elements of collaboration in their research productivity as about 63.7% of the publications were published by more than one author (i.e. through joint and multiple authorship). The extent of multiple collaboration is still low as it was just represented by 30.08% of the total publications. This finding disagreed with the findings of Oyeniyi & Olaifa (2012) as they reported higher collaboration among Nigerian agricultural engineers, again, Udofia (2000) had earlier found out the dominance of multiple authorship patterns among African researchers on Trypanosomiasis.

The low rate of multiple authorship revealed in this study is not good in enough as Katz & Martin (1997) noted that there has been shift in paradigm from individual research work to collaboration in research worldwide. This issue of collaborations in research could not be underplayed by academic staff of research institutes in South-West as studies have shown that collaboration enhances research. In support of this assertion, Gordon (1980) found a positive correlation between the number of authors of a paper and probability of acceptance for publication. Abt (1984) found a positive correlation between the number of authors and the number of citations in astronomical journals. Beaver (1986) indicated that co-authored works in Physics tended to be of higher quality than single authored works.

There is ample evidence that collaboration is a key factor influencing research productivity, and academics that prefer independent or collaborative work tend to show differences in productivity as measured by research publication (Katz & Martin, 1997). International collaboration, in particular, has shown positive impacts on the number of published articles and total number of publications (Smeby & Try, 2005). In his support of collaborative works Subramanyam (2007) reported that collaboration affects the visibility and productivity of scientists. Hence, his categorization of authorship as: collaboration among colleagues, collaboration between organizations, Collaboration between teacher and pupil, collaboration between supervisor and assistant, researcher – consultant collaboration, and International Collaboration. Collaboration has often been associated with higher productivity was also made by Weintraub (2000). Clarke and Preston (2002) also echoed that collaboration or tie-up with other faculty member is one way of increasing the research productivity of academic staff as it provides intellectual companionship which stimulates research.

Major factors hindering research productivity of academic staff in research institutes in South-West, Nigeria as revealed by this study were family challenges, financial constraints, inadequate information accessibility, inadequate time, inadequate information literacy skills and inadequate motivation from employers and inadequate infrastructure. These challenges are similar to findings of Okafor (2011); Donwa (2006); Kennedy & Brancolini, 2012; Lessick et al. (2016)

The problem of inadequate and epileptic electricity supply to power ICT facilities in Nigeria was rightly noted by (Christian, 2008) as hindering factors of research productivity. The findings of this study concurred with the revelation of Migosi, Migiro, & Ogula (2011) that found out that inadequate time, inadequate motivation from employers, inadequate research skills and inadequate funding are major problems hindering research productivity of 227 business faculty members in

Kenya. Nzotta (1997) also echoed the problem of lack of access to resources as factor hampering research productivity among academic staff members in Nigeria as he lamented that books, journals are not often accessible for use. Ajegbomogun & Popoola (2014) also reported similar challenges facing research productivity of lectures in university of Agriculture in Nigeria. These challenges are also similar to the findings of other scholars such as (Brown, 2001; Fox, 2007; Kennedy & Brancolini, 2012; Lessick et al., 2016; O'Brien & Cronin, 2016; Powell, Baker & Mika, 2002; Shaw & Szwajcer, 2016; Spring, Doherty, Boyes, & Wilshaw, 2014).

Imhonopi and Urim (2010) also found out that inadequate funds were a major factor militating against effort of academic staff members in increasing their research productivity. Similarly Yusuf (2012) lamented the poor state of research funding and declining research infrastructure as challenges facing research productivity of academic staff in Nigeria. Mentoring is also part of the problem facing academic staff in improving research productivity as rightly observed by Bentley (2012) and this have implications for the management of the research institutes in South-West Nigeria. This is a great problem as younger academic staff in the research institutes needed to be mentored by more experienced senior colleagues in research activities to increase their research productivity.

Recommendations

Based on the findings of this study, following recommendations are made.

1. There is the need for the research institutes to organise continuous training programmes on information literacy skills to improve research productivity of the academic staff in the research institutes in South-West Nigeria.

2. There is also the need to further improve research skills of academic staff of these research institutes. This could be done by sponsoring academic staff to training on modern research skills both locally and internationally.

3. Adequate infrastructure that will improve research productivity of academic staff in the research institutes in South-West, Nigeria should be provided by the Federal Government.

4. There is also the need for the authorities of research institutes to encourage collaboration and interdisciplinary researches to improve research productivity of the academic staff in the research institutes in South-West, Nigeria.

5. It is also recommended that a Special Research Trust Fund specifically be established by the Federal government of Nigeria that will compel corporate bodies to set aside certain percentage of their profits to research just like Tertiary Education Trust Fund (TETFUND) set for tertiary institutions in Nigeria. This fund should be administered and used specifically for the enhancement of research institutes and research productivity of academic staff in the research institutes in Nigeria, including those in the South-West geo-political zone.

6. There is the need for the government to provide adequate research funds/grants for academic staff of research institutes in South-West, Nigeria to carry out research and get the research output published in reputable outlets locally and internationally.

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