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ICT Use and Research Productivity of Academic Staff in Federal Polytechnic Ede, Osun State, Nigeria

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ABSTRACT

The main purpose of this study was to identify the impacts of ICT use on research productivity of academic staff in Federal Polytechnic Ede, Osun State. The study adopted a survey method. Simple random sampling technique was used to select a sample size of 200 academic staff from all the academic Departments of the Institution, on which questionnaire was administered. From the 200 sets of questionnaire administered, 154 were duly completed and returned, representing 77%. Findings revealed that the research productivity of the academic staff were relatively low. However, they made use of ICT's for their research activities with attendant impacts. Major impacts were noticed in the area of data gathering procedures, and also collaborative research and improvement of quality and quantity of literature search and data analysis. The study recommends among others that academic staff should endeavour to publish more research papers and encouraged to receive trainings and necessary skills on the use of new technologies for research purpose.

Keywords: Research, Research Productivity, Academic Staff, ICT, Federal Polytechnic Ede

1. INTRODUCTION

The importance of conducting research cannot be underestimated in the educational sector. Research helps to acquire more knowledge and also assist in advancing the frontiers of knowledge. Research publications in any field of specialization provides current information for growth, progress, development and an improved society because the various field of specialization works for a common goal which is the growth and development of the society which they operate in and beyond. Information and Communication Technologies (ICT) is a powerful force in our society today. It creates a lot of opportunities for us. ICT makes work easier and comfortable and has the ability and flexibility to enable one achieve greater results with minimal physical efforts; and also provides great development opportunities by contributing to information dissemination and increase access to knowledge. Common ICT facilities include: computer, smart phone, Internet search engines etc. Application of ICT to research activities has been of great relevance as it makes research works easier, fast and comfortable. It also helps to have quick access to other researchers' work. It grants access to more reliable sources of information which can be found in virtual library with utmost convenience and saves time.

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It further helps researchers in their relationship with other researchers and help to collaborate with distant researchers through the use of E-mail, social media, text messages etc. After the gathering of relevant data, ICT also helps in the analysis of the data gathered to evaluate people's opinions and ideas on the topic worked on and most importantly it saves time and energy of the researcher. Technology is an important research tool that helps researchers to locate information sources for their study, collect and analyze relevant data. This underscores the importance of ICT to research undertakings as it helps to gather direct information and access already established information which may be useful to corroborate new findings.

1.1 Statement of the Problem
Information and communication creates a lot of opportunities and it is expected that all sectors of human society should make optimal use of the opportunities offered by this new development. The educational sector, especially the higher institutions of learning are expected to make use of new technologies for efficient research productivity and advancement of knowledge, which are their main focus. However, according to Achibong and David (2009), it has been observed that some academic staff lacks basic ICT facilities and skills that are necessary for the conduct of research, or search for information necessary to complete their research activities.

Similarly, they may find it difficult to collaborate with other distant researchers or communicate their research findings to targeted audience due to this factors. These challenges can affect the research productivities of the academic staff. Therefore, it is against this backdrop that this study was set out to investigate how the use of ICT affects research productivity of academic staff in Federal Polytechnic Ede, Osun State.

1.2 Research Questions
The study is expected to provide answers to the following questions:

i.   What is the level of research productivity of academic staff in Federal Polytechnic Ede, Osun State?
ii.   What are the available ICT's and the ones used for research activities by the academic staff in Federal Polytechnic Ede, Osun State?
iii.   What are the impacts of the use of ICT's on research productivity of academic staff in Federal Polytechnic Ede, Osun State?
iv.   What are the challenges associated with the application of ICT to research activities of academic staff in Federal Polytechnic Ede, Osun State?

2. REVIEW OF RELATED LITERATURES

Research productivity can be described as the rate of the effectiveness of the research conducted by people. Research productivity can be measured by the quantity and quality of research outputs embarked upon by a researcher over a particular period of time (Akuegwu, Udida and Bassey, 2006). There are certain factors that may contribute to researcher's productivity. These factors include: Institutional features, such as type and size of institution, funding, laboratory size (Dever and Morrison 2009; Edgar and Geare 2013); Demographic variables including gender, family size and age of children (Fox 2005; Stack 2004), Academic capabilities and confidence, and self-efficacy (Quimbo and Sulabo 2014); Various social aspects such as workload, time spent, level and type of communication and supervision of doctoral students (Lee and Bozeman 2005). Information and Communication Technologies (ICTs) refers to the integration of telecommunications and computers for information management. This include the use of digital communication gadgets such as computer, scanner, smartphones, internet, wireless networks and other similar equipment for the creation, manipulation, storage, retrieval, dissemination and communication of information (Rouse, 2019).

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ICT contributes to global access to information and has also contributed meaningfully to every facet of human endeavour. According to Techterms (2019), modern information and communication technologies have created a *global village* where people can interact and communicate irrespective of their physical locations. ICT's application to research endeavour is multifarious. ICT is useful in research, especially in such areas as data gathering, processing and analysis. In the view of Yakob (2013), the most straightforward use of ICTs in research is in data processing. There is increase in the ability of computer systems to perform better in using it to manage and process large amount of data than can be handled manually. It equally improves accuracy of analysis of data. Similarly, researchers now have access to limitless numbers of full text journals through online databases, through a more robust and efficient search strategies. It also makes tracking of citations a very easy task. Also, databases and libraries provide researchers with online access to hundreds of scholarly articles that can be used for their studies.

3. METHODOLOGY

This study adopted a survey method. A simple random sampling technique was used to select 200 academic staff in Federal Polytechnic Ede, Osun State. All the academic staff of the Institution constituted the population for the study. However, the total number of academic staff in the institution could not be verified at the Registry Department of the Institution. Data for the study were collected through the use of questionnaire. The questionnaire consisted of five sections namely: Section A: Demographic Variables, Section B: Research Productivity of the Academic Staff, Section C: ICT's that are used for research activities, Section D: Impact of ICT on research, Section E: Challenges Associated with the Use of ICT on Research Productivity. Out of the 200 administered sets of questionnaire, 154, representing 77%, were duly completed, returned and valid for analysis.

4. DATA PRESENTATION AND FINDINGS

Table 1 shows the distributions of respondents according to their biodata. The Table revealed that majority of 51.30% of the respondents have first degree, while 34.42% have MSc. Also, some 4.55% have PhD as their highest qualifications. The Table also revealed that some 13.64% of the respondents are between 25-30 years of age while 32.47% are within the age range of 31-35 years. Also, 70.12% were male while the remaining 29.87% were female. The years of working experience of the respondents range from less than 2 years (9.09%), 3-5 years (49.35%%), 6-8 years (23.38%), 9-11 years (11.69%) and 12 years and above 6.49 (%).

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Table 1: Distribution of respondents according to demographic variables

Highest Academic Qualifications	Frequency	Percentage
HND /BSc./B.A.	9	51.30%
PGD	12	7.79%
MSc	53	34.42%
MPhil./ PhD	3	1.95%
PhD	7	4.55%
Age	**Frequency**	**Percentage**
25 - 30 years	21	13.64%
31 – 35 years	50	32.47%
36 – 40 years	5	3.25%
41 – 45 years	21	13.64%
46 and above	12	7.79%
Gender	**Frequency**	**Percentage**
Male	108	70.12%
Female	46	29.87%
Years of Teaching Experience	**Frequency**	**Percentage**
< 2 years	14	9.09%
3 – 5 years	76	49.35%
6 – 8 years	36	23.38%
9 – 11 years	18	11.69%
12 years & above	10	6.49%
Total	**154**	**100%**

Table 2: How many research papers have you published in the last three years?

Number of Research Papers Published	No of respondents	Percentage
None	7	4.55%
1	25	16.23%
2	37	24.03%
3	36	23.38%
4	15	9.74%
5	12	7.79%
6	7	4.55%
7	4	2.60%
8	2	1.30%
9	3	1.95%
10	4	2.60%
11 and above	2	1.30%
TOTAL	**154**	**100%**

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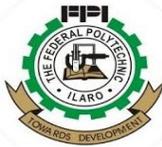
From Table 2, it is evident that 16.23% of the respondents claimed that they have published one research paper in the last three years, while 24.03% have published 2 research papers. Also, 23.38% have published 3 papers in the last three years while only 1.30% claimed to have published 11 papers and above in the last three years.

Table 3: ICT's available and used for research activities among the academic staff

S/N	ICTs used for research activities among the academic staff	Mostly used	Used	Rarely used	Not used
1.	Search engines	104 (67.53%)	35 (22.73%)	13 (8.44%)	2 (1.30%)
2.	Computer	108 (70.13%)	44 (28.57%)	2 (1.30%)	0 (0%)
3.	Smart phones	104 (67.53%)	38 (24.68%)	8 (5.19%)	4 (2.60%)
4.	Scanners	71 (46.13%)	46 (29.87%)	32 (20.78%)	5 (3.25%)
5.	SPSS (Statistical package for social science)	62 (40.26%)	58 (37.66%)	28 (18.18%)	6 (3.90%)
6.	Microsoft excel	75 (48.70%)	58 (37.66%)	20 (12.98%)	1 (0.65%)
7.	Word Processor (e.g. Microsoft word)	95 (61.69%)	55 (35.71%)	0 (0%)	4 (2.60%)
8.	Microsoft power point	79 (51.30%)	62 (40.26%)	13 (8.44%)	0 (0%)
9.	Computer printer	98 (63.64%)	47 (30.52%)	7 (4.55%)	2 (1.30%)
10.	Google form	75 (48.70%)	59 (38.31%)	12 (7.79%)	8 (5.19%)
11.	Social media (for communicating with research collaborators)	79 (51.29%)	61 (39.61%)	13 (8.44%)	1 (0.65%)
12.	E-mail	102 (66.23%)	44 (28.57%)	8 (5.19%)	0 (0%)
13.	Google scholar	41 (26.62%)	76 (49.35%)	30 (19.48%)	7 (4.55%)
14.	Online publishing website	58 (37.66%)	67 (43.51%)	25 (16.23%)	4 (2.60%)
15.	Turn it in	33 (21.43%)	60 (38.96%)	38 (24.68%)	23 (14.94%)
16.	iCloud	40 (25.97%)	49 (31.82%)	33 (21.43%)	32 (20.78%)
17.	Drop box	39 (25.32%)	44 (28.57%)	36 (23.38%)	35 (22.73%)
18.	Referencing software/App	52 (33.77%)	59 (38.31%)	25 (16.23%)	18 (11.69%)
19	Others (Mendeley)	7 (4.55%)	2 (1.30%)	47 (30.52%)	98 (63.64%)

Table 3 indicates various ICTs available and used by the respondents for research activities. Majority of the respondents (67.53%%) claimed to use search engines for research activities, while 8.44% claimed that they rarely use search engines for research activities. Also,67.53%% claimed that they mostly used smart phones for research activities while some 20.78% and 18.18% others claimed that they rarely used scanners and SPSS package for research related purposes, respectively. Also, 48.70% claimed that they mostly used Google form while 51.29% claimed that hey use social media for communicating with research collaborators.

Also, only 26.62% and 21.43% claimed that they used Google Scholar and Turn it in, respectively, for research activities. Few of the respondents (4.55%) claimed that they mostly used Mendeley for their research activities. Mendeley is a referencing management software.

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What are the impacts of the use of ICT's on research productivity of academic staff in Federal Polytechnic Ede, Osun State?

Fig 1 shows that majority of the respondents agreed that the use of ICT has positive impacts on their research productivity as 68.88% of the respondents strongly agreed that the use of ICT's improves data gathering procedures. Also, some 65.58% claimed that it facilitates collaborative research; improves quality and quantity of literature search; and helps to save time and energy of the researchers. Also, 69.94% claimed that the use of ICT helps to improve data analysis procedures.
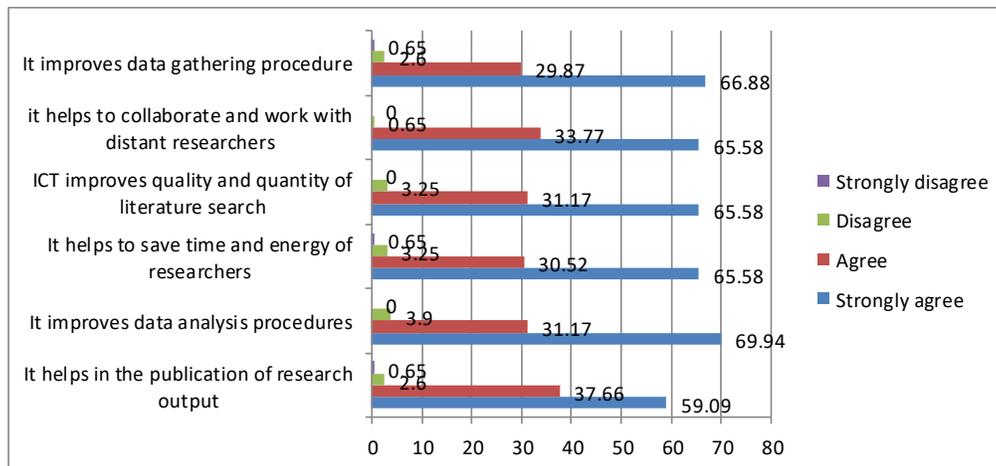

Fig. 1: Impact of the use of ICT's on Research Productivity of Academic Staff in Federal Polytechnic Ede.

Challenges faced by academic staff in Federal Polytechnic Ede on using ICT for research activities
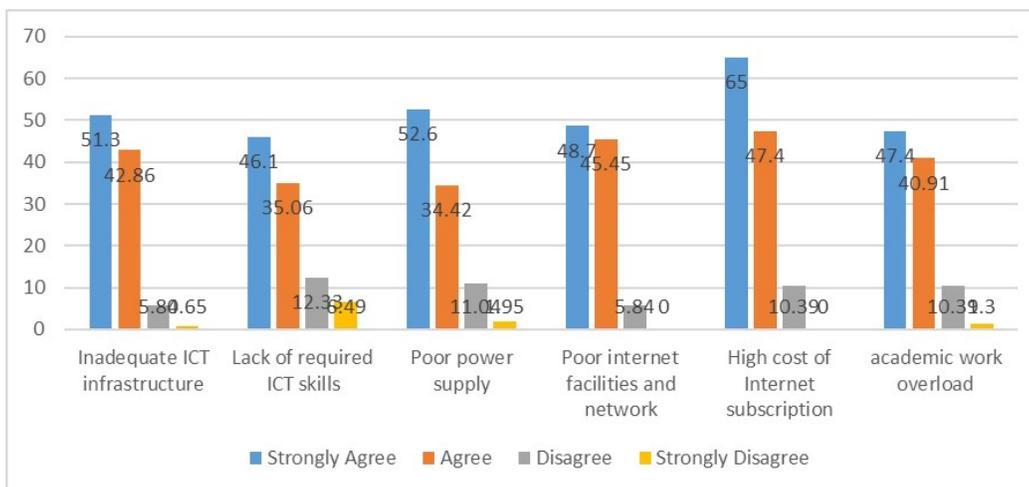

Figure 2: Challenges of ICT on research activities

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Fig 2 shows that majority of the respondents face various challenges on using ICT for research activities. Some 51.3% of the respondents strongly agreed that inadequate ICT infrastructure tends to be an obstacle to their research works, while some 46.1% also strongly agreed that lack of certain ICT skills affect their research productivity. Similarly, 52.6% and 48.7% of respondents claimed that poor power supply and high cost of subscribing to Internet services constituted as challenges, respectively. Also, some 47.4% strongly agreed that their tight schedules affected the use of ICT for research activities.

5. DISCUSSION OF FINDINGS

The study revealed that academic staff in Federal Polytechnic Ede, Osun State engage in research activities with varying number of research publications in the last three years. Also, majority of the respondents only published between 1 and 2 research papers in the last three years, which is considered relatively small. Only a fraction of 14.30% published between 6 and 11 papers in the last three years. This is in line with Lotka's law of authors' productivity as discussed by Sudhier (2013) that only a few percentage of authors contribute larger number of articles in scholarly publications, while majority usually contribute 1 or 2 papers over a given period of time. Findings also showed that majority of the respondents mostly used search engines, computers, smart phones, word processor, social media and e-mails, while they also claimed that they did not use Google forms, Google Scholar and Power points. This is in line with Cuff (2015) findings on a similar study.

It was equally discovered that ICT use have impact on research productivity of the academic staff, especially in such areas as data gathering procedure, assist in collaborative research, improves quality and quantity of literature search, and improving data processing/ analysis. This is similar to Bugyei, K. A., Obiri-Yeboah, K. & Kavi, R. K. (2017) findings on impact of ICT use on research activities of some scholars in Ghana. Also, academic staff in Federal Polytechnic Ede face various challenges in using ICT for research activities. Prominent among the challenges include inadequate ICT infrastructure, high cost of subscribing to the internet and tight schedule of the academic staff. This is in line with (Lee and Bozeman 2005) findings.

6. CONCLUSION

It is evident from the study that academic staff in Federal Polytechnic Ede, Osun State have low research productivity level in the last three years. Also, the academic staff used several ICT's for research activities, mostly which include Search Engines, Computers and E-mail. It is also evident that the use of ICT has a high impact on research productivity of the academic staff. However, they face some attendant challenges in using ICT such as inadequate ICT facilities and tight schedule of the academic staff.

7. RECOMMENDATIONS

Based on the findings of this study, the followings are hereby recommended:
- Academic staff in Nigerian Polytechnics should endeavour to be more scholarly productive by engaging in research activities that will not only advance knowledge in their individual fields of study, but also benefit the society at large.
- Also, collaboration with other researchers within and outside their institution should be encouraged among the academic staff, especially now that there are various ICT applications for communicating with other researchers globally. Collaborative research is a global trend which the academic staff in Federal Polytechnic Ede should also key into.

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- Academic staff in the Institution should be encouraged by the institution management to acquire trainings and necessary skills on the use of new technologies for research purpose, especially the use of SPSS and PowerPoint for presenting their research findings and also to increase their research productivity.
- Lastly, necessary ICT facilities should be provided by the Polytechnic management and adequate training conducted on their use.

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