Information Communication Technology and Research Productivity of Librarians in Selected Private Universities in Southwest Nigeria

Tolulope E. ADENEKAN
Department of Information Management
Faculty of Communication & Information Sciences,
Lead City University
tolu.adenekan@lcu.edu.ng

&

Deborah Bamidele OLOGUN
NimbeAdedipe Library
Federal University of Agriculture, Abeokuta
deborahbamidele1234@gmail.com

Abstract
This study is to identify the effects of information and communication technology on librarians' research output at selected private universities in Southwest Nigeria. A descriptive survey design was adopted in the investigation. The population of the study was made up of 120 practicing Librarian from Six (6) private Southwest Nigerian universities. Data was collected through questionnaire and analyzed with the use of the descriptive statistical method. Findings showed that librarians' research output was low. However, they used ICTs in their research operations, which had ramifications effect. The significant effects were observed in the areas of data collection techniques, collaborative research, and the enhancement of the amount and quality of literature searches and data analysis. The report makes several recommendations, including that librarians should try to publish more research articles and be encouraged to have the training and skills they need to use new technology for research.

Keywords: ICT, Research productivity, Librarians and University Library

Introduction
Research productivity, the number of scholarly materials produced by academics in a unit time, has recently become the focus of considerable interest in professional responsibility of librarians in universities. This interest stems from recent trend in librarians' career development and progressions. Waiting periods of 2 -3 years from the last promotion, vacancies availability and Head of Department's satisfaction of librarians' job performance are no longer premium criteria for the promotion and appointments of librarians, but additional qualifications and contributions to knowledge are presently significant criteria for librarians' promotions and other related responsibilities. This implies that the more a librarian is able to increase his research productivity, the more is his chance to gain academic success. Therefore, the pressure to publish along with other professional obligations is highly imperatives for academic success and survival of librarians in universities.

The trends also suggested an increasing interest in exploring factors that significantly influenced research productivity. Previous studies have examined demography, education and

experience, intrinsic motivation, personal commitment and personality, among others as individual attributes that influence research productivity. Similarly, studies have identified collaboration, mentoring and peer supports, and institutional supports as factors influencing research productivity of academics in several contexts. However, since a stick rarely fits all, there is need to investigate the influencing factors peculiar to librarians in university context. Moreover, according to Dhanavandan, Esmail, Mohammed, and Nagarajan (2012), information technology has drastically influenced every facet of human endeavors, including librarianship. ICT skills which represent the ability of a librarian to use diverse of technologies such as computers, retro-graphics, audio-visuals, and other electronic devices for generating, storing and dissemination of information have been suggested to influence job performance of librarians in universities. Specifically, ICT skills were found to greatly reduce task production period, easy access and collaboration with colleagues, resource acquisition and data gathering procedure. However, there has been little or no study that has specifically examined how these skills influence librarians research productivity.

Librarians' enthusiasm and capability to achieve and maintain steady research productivity is inconsistent, some librarians were excelling in scholar production, whereas others are still struggling for understanding of the nitty- gritty of the production. While there is an increasing interest in the research productivity of librarians, the factors which increased the productivity have not yet been fully explored.

Previous studies have mostly investigated factors that inhibit research productivity, such as time constraint, non-availability of training and experience and lack of supports in other countries and disciplines. Factors that influence the productivity are less examined. Also, very few studies that have examined the favorable factors have failed to quantify research productivity of the librarians but simply intend to know the particular types of research products they produced.

This study will therefore examine the influence between ICT skills and research productivity of librarians in selected private universities in southwestern Nigeria. The results of these study will not only contribute to the understanding of factors influencing research productivity of librarians but will also power the influence on research productivity.

Statement of the Problem

Librarians in private universities in Southwest Nigeria are facing increasing pressure to enhance their research productivity, as it has become a critical factor for their career advancement and professional success. However, despite the growing importance of research output, there is a noticeable gap in our understanding of the specific factors that influence the research productivity of librarians in this context. Furthermore, while information and communication technology (ICT) has become an integral part of librarianship, there is a lack of comprehensive research that examines how ICT skills and tools impact the research productivity of librarians in these institutions. Specifically, the issues of low research productivity, usage of ICT by Librarians, challenges in ICT utilization, and influence of ICT on Research Productivity need to be addressed.

However, this research work seeks to address the overarching problem of low research productivity among librarians in private universities in Southwest Nigeria by investigating the role of ICT skills and technologies in shaping their research activities. By understanding the

specific challenges and influences related to ICT, it aims to provide valuable insights and recommendations to enhance the research productivity of librarians in these institutions.

Aim & Objectives of the Study

The aim of this study is to investigate the influence of ICT and research productivity of librarians in private universities in southwest Nigeria. Specifically, the objectives of the study are to:

1. determine the level of the research productivity of librarians in private universities in Southwest Nigeria;
2. find out the ICT in use by librarians in private universities in Southwest Nigeria;
3. examine the challenges facing the use of ICT by librarians in private universities in Southwest Nigeria; and
4. determine the influence of ICT on research productivity of librarians in private universities in Southwest Nigeria.

Research Hypotheses

H_{01}:   There is no significant influence of ICT skills on research productivity of librarians in private universities in southwest, Nigeria.

Literature Review

Research productivity

The number of papers published by a particular unit in a given time is referred to as publication productivity (Sudhier and Abhila, (2011). The number of publications published by librarians in a certain period of time is a well-known research productivity measure. Working with post-graduate students on dissertations and class projects, carrying out editorial duties, obtaining patents and licenses, writing monographs, developing experimental designs, producing works of an artistic or creative nature, and engaging in public debate and commentaries are all examples of publications (Iqbal and Mahmood, (2011). Publication is essential to scholarly activity and acknowledgment, as it is commonly recognized as the primary source of esteem, a necessity for individual advancement, proof of institutional superiority, and a prerequisite for receiving competitive research grants (Ramsden, (1994). Studies have demonstrated that a high publication rate is linked to advancement in (the profession and respect among peers, thus librarians' publication patterns should be investigated Korytnyk, (1988).

Librarians are driven to publish for a variety of reasons. According to Ogbomo (2010), librarians' publication productivity is influenced by their eagerness or excitement to publish, the presence of a conducive environment, and their self-assessment of their function. Many universities have looked at the amount of publications produced by academic librarians in order to promote them. Shin and Jang (2014) state that the current promotion requirements are more strict than in the past. This was backed up by Ogbomo (2010), who claimed that the publication criterion is a brand new one for libraries in Nigeria, and that librarians previously only had three conditions for advancement. These factors include 2-4 years of work experience since the last promotion, job availability, and certification performance. Similarly, according to research by Hart (1999) referenced by Okonedo (2015), 95% of librarians at Penn State University

agreed that expectations for publishing have risen considerably in recent years. As a result of the institution's increased expectations, publication patterns are shifting, and librarians, like their teaching counterparts, are faced with the situation of "publish or perish."

Hart (1999) reported that 80 percent of librarians at Penn State University recognized the importance of publications for their career achievements, and that the majority of them spent roughly 19.8 hours per month on their research. Over the 15 to 20year period analyzed, this resulted in an increase in the amount of research and publishing production among Penn State University librarians.

Okafor (2011) revealed that while there is no statistical difference in the mean research production of academics in the institutions studied in southern Nigeria, there is a statistical difference in the mean research output between the universities when local journal articles are considered. Ogbomo (2010) discovered that too much demand on daily job routines, rating of journal titles, weak/poor research orientation, lack of academic freedom, and lack of interest are barriers to publication outputs in a study on librarians' publication outputs. This constraint was summed up by Onohwakpor and Tiemo (2006) as a lack of knowledge about where to publish. Part of the difficulty, according to Moahi (2007), is a lack of time and weak publishing skills. The preceding debate established the importance of research and publication in academics' lives, their importance in the development of knowledge and careers, and the issues related with librarians' research and publication efforts. This study, seeks to investigate the ICT skills and research productivity of librarian in selected private universities in southwest Nigeria. The main goal is to determine the ICT incorporation of librarians' influence on the extent to which librarians participate in research and publication.

Information and Communication Technology (ICT) and Research Productivity of Librarians in Southwest Nigeria.

Because the concepts, methods, and applications involved in ICT are constantly growing on a daily basis, there is no commonly agreed definition of ICT. It's difficult to keep up with the changes because they occur so quickly. Consider all of the existing uses of digital technology in aiding individuals, businesses, and organizations in managing information as a good approach to think about ICT. Any product capable of storing, retrieving, modifying, transferring, or receiving information electronically in a digital form falls under the umbrella of ICT. The convergence of audio-visual and telephone networks with computer networks via a single cabling or link system is also referred to as ICT. According to Gurari (2009), ICT is a collection of computer hardware, software, and telecommunication devices such as telephone systems, modems, routers, fiber optic cables, satellite communication systems, and so on. According to Murray (2011), ICT is an abbreviated term for information technology (IT), which includes the integration of telecommunication devices such as telephone lines, wireless signals, computer hardware and software, as well as storage devices and audiovisual systems that ensure information access, storage, and dissemination. Similarly, Zuppo (2012) stated that ICT is related with technologies that give access to information via communications devices and appliances. He went on to say that information and communication technology (ICT) refers to any product that stores, retrieves, manipulates, transmits, or receives data in a digital format. ICT is the information infrastructure and component that enables modern computing. She went

on to say that "interaction in a digital environment" is a word that incorporates all information technology, networking components, and application software, Rouse (2017).

Competency, on the other hand, refers to the ability to complete a task successfully and quickly. It refers to the abilities, qualities, and skills required to complete a task. It also tends to indicate the amount of expertise of an individual in completing a certain task or career. Competency refers to an individual's abilities, skills, qualities, and proficiency in performing or doing something efficiently. Competency, according to Ojiegbe (2010), is a way of proving an individual's knowledge, abilities, experience, and attribute to successfully carry out a given function. Competency is a collection of specified skills that serve as a systematic guide for measuring and evaluating an individual's proficiency in carrying out an activity. Competency may be defined as a set of practical and theoretical knowledge, skills, behavior, and value that is required to improve a performance. It can also refer to the state or quality of being properly equipped and qualified to complete a task. In support of the above, Larzen (2006) stated that competency is a combination of theoretical knowledge and practical experience that defines an individual's ability to take the appropriate action when doing a task. Competencies, according to Ferreira et al. (2007), are information, skills, talents, and attitudes that should be obtained through education and training. Competency aims to assess an individual's level of professionalism. ICT The ability of library employees to make proper use of ICT tools for information selection and acquisition, organization, storage, retrieval, and dissemination is measured by their competency. Marshall, Taylor, and Yu (2003) argue that librarians have two types of competencies: professional proficiencies, which deal with knowledge of information resources, information technology, leadership and managerial skills, and research; and competencies, which are a set of skills, attitude, and values that emphasize continuous learning throughout a librarian's career as well as the ability to cope with change. In light of the foregoing, Gulati and Raina (2000) stated that a librarian's competency includes knowledge of both print and electronic information resources.

The introduction of ICT to library operations has changed many of the library's tasks, such as how information is gathered, processed, and disseminated, which was formerly done manually but is now automated. Librarians and practitioners in the new era are expected to have ICT skills that will allow them to take on a new role as dictated by the new environment in which they currently work. In line with the foregoing, Achebe (2010) correctly remarked that information and communication technology (ICT) has boosted academic library operations by providing the required support for learning, teaching, and research at their parent institutions. Some of the benefits of ICT to library operations, according to Adebisi (2009), include speed and convenience of access to information, remote access, that is, limitless access, which overcomes the constraint of closing hours, which confined access to a specific time and hours.

ICT Competencies of Librarians
ICT competency of librarians is defined by APLEN (2008) as a set of skills, knowledge, and behaviors connected to library technologies that are critical to parent institutions' success, personal performance, and capacity building. ICT abilities remain the most desirable and crucial among the different needed skills and competences required of an academic librarian, according to East (2007). ICT capabilities of librarians may thus be defined as the relevant

skills and knowledge required of those working in libraries in order to properly leverage electronic information search, retrieval, and distribution. Chisita and Shoko (2010) support the above assertion by stating that modern technology has assisted in the transformation of the library from a mere book store to an important access point for information, necessitating professional re-strategizing on the part of librarians to continue to acquire more and more ICT skills relevant to information handling and management.

The impact of ICT on information services is characterized by changes in format, content, and production methods, as well as changes in the contents, production methods, and distribution methods of information products. The Internet has changed the role of librarians and information scientists from intermediary to facilitator, introducing new tools for information dissemination and a shift from physical to virtual services environments, as well as the extinction of some traditional information services and the emergence of new and innovative web-based services. ICT's impact and effect in LIS is undeniable, given how pervasive it is in library practice and education (Kamba, (2011). The importance of training librarians for long-term ICT competency was highlighted in this stance. Curry (2000) correctly stated that in order for a librarian to meet world standards, ICT must be included in LIS professional training. Minish-Manjaja (2007) corroborates the foregoing by emphasizing the need for librarians to be well-versed in ICT skills. The preceding demonstrates the requirement for library workers to be adequately trained with proper ICT skills to aid them in handling users' information needs and managing library information resources. Nigerian library schools acknowledge the relevance of ICT in executing library routines and services, hence they have made a huge step forward by integrating and infusing ICT skills into the curriculum. As admirable as this attempt is, the reality that most ICT competencies are taught in theory since most library schools lack computer laboratories and internet connectivity, which has hampered the optimal goal of incorporating ICT skills into the curriculum (Kamba, 2011).

According to Mahmood and Ajmal (2007), the majority of Pakistani library workers need to take specialist ICT courses such as computer programming in Visual Basic, JAVA, and networking, among other things. They must also study about specific librarianship courses, such as developing a digital library, MARC, and so on. Librarians, particularly those who were trained in traditional library schools, must demonstrate a willingness to be trained and retrained in ICT abilities, according to Ekoja (2007), if they are not to become obsolete in the ICT age. As a result, Koneru (2006) believes that training is required to close knowledge and skill gaps and achieve efficiency. According to Aguolu and Aguolu (2002), no library professional can fulfill his responsibilities unless he takes the time to keep up with current literature in the field, develop himself through seminars, conferences, workshops, refresher courses, and a conscious study of new developments in the field. They also advocate for on-the-job training, which he believes is the obligation of the business to give as part of their orientation programs for new employees. Similarly, Garuba (2007) supports this viewpoint when he claims that librarians must learn new ways to accomplish their jobs as their roles change. He goes on to say that computer literacy is critical for library personnel not only in Nigeria but also in other developing countries.

Computer literacy, word processing, spreadsheet, database management, online search, text digitization, content management, document management, library automation, web design and development, and other skills are required for the role of a librarian, according to Ocholla,

Ocholla, & Onyancha (2003). Even with the following being included into the curriculum, the requirement for periodic evaluation of LIS professionals' ICT competency arises since some of the ICT competencies introduced into the curriculum are taught theoretically without enough practical training. Diso and Njoku (2007) backed up the previous statement by stating that librarian training in Nigeria is insufficient and requires radical restructuring in order to produce a new generation of librarians capable of performing admirably in the digital age and knowledge society. The exponential rise of ICT has catapulted the globe into an information-driven civilization that relies on information, resulting in a shift in librarian service delivery (Salisu, 2002). According to Nwachuku (2005), using computers to make knowledge accessible and consumable requires a wide range of skills, particularly for librarians. He also claims that computers improve job productivity, and that librarians must acquire necessary computer skills and competence in order to make their professional positions more relevant in today's knowledge-based society. In line with the foregoing, Garuba (2007) asserts that librarians' ever-changing roles require them to learn new ways of performing their duties, and that ICT competency is especially important for librarians in Nigeria and other developing countries who lag behind their counterparts in the developed world.

The introduction of ICT on the global scene ushered in a revolution in libraries, altering the ways and patterns in which information services are provided Ademodiand Adepoju, (2009). In support of this, Nwachukwu (2005) claims that changes in information processing, access, storage, and dissemination necessitate the acquisition of new skills by LIS professionals in order to cope with change. Sharp (2001) correctly states that in order for a librarian to remain relevant, they must go where their patrons are, even if they are not physically present. LIS workers must be ICT competent and compliant in order to embrace change and move closer to where their clients live (the digital world). According to Owoyemi (2001), one of the most important ICT tools is the computer, which is a machine capable of taking, storing, retrieving, and processing data based on pre-defined instructions. Ademodi and Adepoju (2009) emphasized the importance of computers in today's libraries, stating that "computers play a major role in today's libraries."

capable of doing a huge number of manual tasks in the library in a short amount of time They went on to say that a computer is an important instrument in the library for creating and processing information. In a similar vein, Salisu (2002) emphasized that because the world is being driven by technology, information service providers must be technology compliant as a matter of need and push for ongoing professional training and education.

In order to fully utilize the potentials that ICT has to offer for information management, librarians who will be running it must have a particular level of proficiency. On a different note, librarians are required to keep their knowledge and skills in ICT skills up to date in order to work optimally in today's ever-changing technology-driven world. Nagarajan (2012) said that library and information science professionals need to be trained in the newest ICT skills to stay current and improve their effectiveness in offering enhanced and dynamic information services to users.

Many authors and researchers have suggested that a librarian's ICT competencies should include, but not be limited to, operating system knowledge, software packages, programming language, online services, project management, searching skills (OPAC and search engines), database management, web design and development, metadata skills, word

processing, spreadsheets, electronic presentations, web navigation, e-mail, information packaging and brokerage, internet and networking Nyamboga, (2007); Islam and Islam, 2007; Pairy, (2007), Levin, (2007) and Morgan (1998).

Beckett and Hager (2002) and Babu (2007) both provided examples of how library employees might acquire and improve their ICT skills. Formal continuing education, such as a Master's program, informal education (remote learning), education through colleagues, self-study (learning by doing), supplier training, attending IT programs, participation courses, workshops, and conferences are all examples of these ways. Internally, that is, within the office, or externally, that is, outside the workplace, competency acquisition programs can be organized. According to Mahmood and Ajmal (2007), the majority of Pakistani library workers need to take specialist ICT courses such as computer programming in Visual Basic, JAVA, and networking, among other things. They must also study about specific librarianship courses, such as developing a digital library, MARC, and so on.

Constraints to ICT Skills Acquisition
Lack of interest in ICT skills acquisition (conservative), technophobia (fear of technology), nonchalant attitude, ignorance and apathy, poor library funding, insufficient skilled personnel to trained librarians in the country, limited training opportunities, and lack of motivation were among the constraints identified by Ayoku and Okafor (2015) in their study of ICT skills acquisition and competencies among librarians in Nigerian universities.

Lack of training in ICT applications, lack of information infrastructures, lack of support from management, lack of coordination among library staff, and lack of initiative from professional associations to conduct specialized training were all mentioned in Mathew and Baby's (2012) study of developing technological skills for academic librarians in universities in Kerala, India.

The aforementioned barriers to librarians acquiring ICT skills have an impact on the extent to which libraries use ICT tools to provide better and more dynamic information services to users. Watts and Ibegbulen (2006) backed up this assertion, claiming that a lack of suitable ICT infrastructure and in-depth digital skills among library employees were hurdles to the use of ICT tools and services in the library. One of the challenges to using ICTs in the library, according to Oduwole and Sowole (2006), is a lack of basic digital skills among library workers.

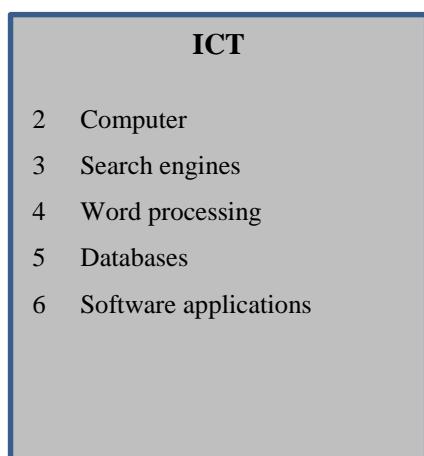**Theoretical Framework of the Study**
The Theory of Planned Behavior (TPB) was adopted for this study. Ajzen (1991) presented a theoretical model, TPB, which focuses on cognitive self-regulation. It takes into account an additional construct, namely perceived behavioral control. Perceived behavioral control refers to the perception of control over the performance of a given behavior. In Theory of Reason Action (TRA) rational considerations determine the choices and behaviors of individuals, and individual intentions determine behavior. Intentions refer to individuals' plans and motivations to commit a specific act. Intentions also reflect individual attitudes and the extent to which individuals perceive a specific act as desirable or favorable. The theory suggests that human behavior is governed by personal attitudes, but also by social pressures and a sense of control. Ajzen (1991) reviews that the theory was applied, for example, in studies examining problem

drinking or leisure behavior, in which the theory provided useful information to understand these behaviors, or to implement effective interventions to change them. In their studies Taylor and Todd (1995) and Mathieson (1991) compared the ability of TPB and TAM to explain behavior and predict an individual's intention to use ICT, respectively.

Within the context of higher education, motivation predicts the attitudes and behaviours of academics toward teaching, research, and services. ICT can motivate librarians to conduct research because it will influence collaboration with their colleagues, shortens time for research production and online material acquisition. According to attribution theory of motivation, actions are concerned with the perceived causes of success and failure of the actions The main principles of the theory focus on both antecedents and consequences of perceived causality. Among the antecedents or determinants of research productivity attributions discussed was ICT for this study.

Conceptual framework of the study

Independent variable   *Dependent*

Variable

ICT		Research productivity
2 Computer	H_{01}	Numbers of
3 Search engines		▪ Increase in number of paper publication
4 Word processing		▪ Innovative research work
5 Databases		▪ Books' chapters
6 Software applications		▪ Conference proceedings
		▪ Books published

Methodology

The research design adopted for this work was descriptive survey. It is non-experimental as the variables are not manipulated by the researcher, thus were only measured. The research instrument for data collection used in this research is the self-structured and administered questionnaire. The study population comprises of practicing Librarians in selected private universities in Southwest Nigeria. The researcher adopted the random sampling technique, and the sample size selected for this research work is one hundred and twenty (120) librarians in selected six (6) private universities. Stratified sampling techniques were used to choose sample from available population of librarians at each school.

Table 1: First generation private university in each state, Southwest, Nigeria

S/N	University	State	Year of Establishment
1	Afe Babalola University, Ado-Ekiti	Ekiti	2009
2	Covenant University, Ota	Ogun	2002
3	Bowen University, Iwo	Osun	2001

4	Achievers University, Owo	Ondo	2007
5	Ajayi Crowther University, Oyo	Oyo	1999
6	Caleb University, Imota	Lagos	2008

Table 2: Population of academic librarians in the selected private universities

S/N	University libraries	Population of librarians	Total enumeration
1	Afe Babalola university library	18	18
2	Covenant university library	24	24
3	Bowen university library	21	21
4	Achievers university library	17	17
5	Ajayi Crowther university library	19	19
6	Caleb university library	11	11
	Total	110	**110**

Source: academic planning office

The data collected in the study were analyzed using descriptive measures such as simple percentage, mean and frequencies to analyze research questions. The analysis of data was aided with the use of the computer software, SPSS 20.

Analysis Result

All one hundred and twenty (120) copies of the questionnaires that were distributed to the respondents from the six (6) schools were retrieved from the respondents, resulting in a response rate of 100%, and all were used for the analysis.

Table 3: Level of the Research Productivity of Librarians in Private Universities in Southwest Nigeria

| ITEMS | No of publications within | | | |
	3 Months	6 Months	9 Months	12 Months (A year)
Articles in journals	10 (8.3%)	20 (16.7%)	35 (29.2%)	55 (45.8%)
Conference Proceedings	7 (5.8%)	10 (8.3%)	45 (37.5%)	58 (48.3%)
Chapters in books	11 (9.2%)	21 (17.5%)	36 (30%)	52 (43.3%)
Textbooks	13 (10.8%)	29 (24.2%)	31 (25.8%)	47 (39.2%)
Co-authored textbooks	22 (18.3%)	28 (23.3%)	25 (20.8%)	45 (37.5%)
Thesis/dissertation	7 (5.8%)	37 (30.8%)	27 (22.5%)	39 (32.5%)
Technical Reports	3 (2.5%)	37 (30.8%)	36 (30%)	44 (36.7%)
Scientific peer-review bulletin	20 (16.2%)	26 (21.7%)	29 (24.2%)	45 (37.5%)
Occasional papers	14 (11.7%)	27 (22.5%)	33 (27.5%)	46 (38.3%)
Monographs	1 (0.8%)	2 (1.7%)	23 (19.2%)	94 (78.3%)

Source: Field Data

It can be noted from Table 3 the questionnaire indicates the level of the research productivity of librarians in private universities in Southwest Nigeria. The result shows that most the respondents 45.8% published articles in journals at every interval of 12 months (a year), 48.3% of the respondents published in conference proceedings at the interval of a year, 43.3% of the

respondents published in chapter of books at the interval of a year, 39.2% of the respondents published in textbooks at the interval of a year. Furthermore, 32.5% of the respondents write thesis or dissertation within a year, 36.7% of the respondents published technical report at the interval of a year, 37.5% of the respondents contributes to the scientific peer-review bulletin and co-authored textbooks within at the interval of a year respectively, while most of the respondent 78.3% writes at least a monograph within at the interval of a year.

Table 4: ICT's available and used for research activities by Librarians

Items	Not Use	Rarely Used	Used	Mostly Used
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
Microsoft Office (MS Word, Excel etc,)	2 (1.7%)	10 (8.3%)	46 (38.3%)	62 (51.7%)
SPSS (Statistical Package for Social Science)	32 (26.7%)	43 (35.8%)	30 (25%)	15 (12.5)
Scanning and uploading	26 (21.7%)	44 (36.7%)	43 (35.8%)	7 (5.8%)
Electronic Presentation (e.g., Power Point)	13 (10.8%)	44 (36.7%)	61 (50.8%)	2 (1.7%)
Access and download e-information services	31 (25.8%)	16 (13.3%)	38 (31.7%)	35 (29.2%)
Use search engines to find information	6 (5%)	18 (15%)	45 (37.5%)	51 (42.5%)
Web searching	14 (11.7%)	21 (17.5%)	32 (26.7%)	53 (44.2%)
Download files from Internet	16 (13.3%)	10 (8.3%)	44 (36.7%)	50 (41.7%)
Google form	45 (37.5%)	34 (28.3%)	30 (25%)	11 (9.16%)
Reference software/App	67 (55.8%)	23 (19.2%)	18 (15%)	12 (10%)

Source: Field Data

Table 4 indicates various ICTs available and used for research by the respondents. Majority of the respondents (51.7%) claimed that they mostly used Microsoft office such as MS Word, Excel and the likes for research activities. Also, majority of 61% used electronic presentation while 36.5% claimed that they rarely used scanners and uploading machine respectively. Similarly, 42.5% of the respondents claimed to mostly used search engines to find information, while a fraction of 31.7% also claimed that they used access and download e-information service. Also, some 36.7% also claimed that they used to download files from internet. Meanwhile, majority of 37.5% and 67% did not use Google forms and Referencing software/ Applications.

Table 5: Challenges Facing the Use of ICT Tools by Librarians

Items	Strongly Disagreed	Disagreed	Agreed	Strongly Agreed	Remarks
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	
Inadequate ICT infrastructure	5 (4.2%)	21 (17.5%)	37 (30.8%)	57 (47.5%)	Strongly Agreed

Lack of staff training/development	11 (9.2%)	43 (35.8%)	49 (40.8%)	17 (14.2%)	Agreed
Lack of technological know-how	32 (26.7%)	30 (25%)	43 (35.8%)	15 (12.5)	Agreed
Inadequate research skills (e.g. statistical data analysis)	9 (7.5%)	21 (17.5%)	42 (35%)	48 (40%)	Strongly Agreed
Technophobia	25 (20.8%)	15 (12.5%)	63 (52.5%)	17 (14.2%)	Agreed
Epileptic power supply	32 (26.7%)	43 (35.8%)	30 (25%)	15 (12.5%)	Disagreed
Consuming workload	5 (4.2%)	17 (14.2%)	44 (36.7%)	54 (45%)	Strongly Agreed
Unconducive work environment	31 (25.8%)	18 (15%)	43 (35.8%)	28 (23.3%)	Agreed
Inadequate ICT resources in the library	28 (23.3%)	37 (30.8%)	43 (35.8%)	12 (10%)	Agreed
Inadequate web searching skills	45 (37.5%)	33 (27.5%)	27 (22.5%)	15 (12.5%)	Strongly Disagreed

In table 5, participants were asked their level of agreement and disagreement with challenges associated with the use of ICT tools by the librarian, result of survey revealed that most respondents constituting 47.5% strongly agreed to the fact that inadequate ICT infrastructure in the library is one of the challenges militating against the use of ICT tool by the librarians, 40.8% of respondents agreed that lack of staff training and development is a major challenge to use of ICT tool in the library; respondents that constitute 35% agreed that inadequate research skills such as data analysis and so on posed challenge to use of ICT tools by the librarian; fear of technology on the part of library staff was agreed upon by 52.5% of respondents; epileptic power supply was disagreed upon by 25% of the respondents as a form of constraint to the use of ICT tool in the library, consuming workload of staff was strongly agreed upon by 45% of the respondents.

Respondents representing 35.8% contend strongly that unconducive work environment also militate against efficient use of ICT tools by the librarian; Also, respondents representing 35.8% consent to inadequate ICT resources in the library as a challenge to utilization of ICT tools by the librarian, while 37.5% of the respondents strongly disagreed with inadequate web searching skills as one of the challenges militating against the use of ICT tool by the librarians.

Table 6: Influence of ICT on Research Productivity of Librarians

Items	SD	D	A	SA
ICT improves data gathering procedure.	16 (13.3%)	10 (8.3%)	44 (36.7%)	50 (41.7%)
My knowledge in ICT helps in sorting for good materials for my research works.	20 (16.2%)	26 (21.7%)	29 (24.2%)	45 (37.5%)

The use ICT enables me to publish articles in journals both in local and international paper.	25 (20.8%)	15 (12.5%)	63 (52.5%)	17 (14.2%)
The use of ICT helps to contribute to conference proceedings and other means of publications.	14 (11.7%)	27 (22.5%)	33 (27.5%)	46 (38.3%)
The use of ICT enables me to express my idea and thoughts better.	5 (4.2%)	17 (14.2%)	44 (36.7%)	54 (45%)
It helps to collaborate and work with distant researchers.	2 (1.7%)	10 (8.3%)	46 (38.3%)	62 (51.7%)
ICT improves quality and quantity of literature search.	11 (9.2%)	21 (17.5%)	36 (30%)	52 (43.3%)
It helps to save time and energy in my research work.	13 (10.8%)	29 (24.2%)	31 (25.8%)	47 (39.2%)
It improves data analysis procedures.	15 (12.5%)	43 (35.8%)	30 (25%)	32 (26.7%)
The use of ICT helps in my job performance.	5 (4.2%)	21 (17.5%)	37 (30.8%)	57 (47.5%)

Source: Field Data

Table 6 shows the impact of ICT on research productivity of the respondents. The table shows that majority of 41.7% of the respondents strongly agreed that use of ICT improves data gathering procedures; 37.5% of the respondents strongly agreed that the knowledge in ICT helps in sorting for good materials for my research works; 52.5% of the respondents agreed that the use ICT enables them to publish articles in journals both in local and international paper; 38.3% of the respondents stated that the use of ICT helps to contribute to conference proceedings and other means of publications. Some 45% of the respondents also claimed that it enables them to express their idea and thoughts better save time and energy of the researchers. Also, 51.7% of the respondents strongly agreed that the use of ICT helps to collaborate and work with distant researchers. Furthermore, 43.3% of the respondents strongly agreed that the use of ICT improves quality and quantity of literature search; 39.2% of the respondents strongly agreed that it helps to save time and energy in research work. It is worthy of note that some 32% of the respondents strongly disagreed that ICT improves data analysis procedures. While, 47.5% claimed that the use of ICT helps in their job performance.

Testing the Hypothesis

H_{01}: There is no significant influence of ICT skills on research productivity of librarians in private universities in southwest, Nigeria.

Ground Rule: The null hypothesis is accepted when:

      i. the ANOVA result sig. is less than significant level of 0.05

Table 7**:**One-Way ANOVA table of significant influence of ICT skills on research productivity of librarians in private universities in southwest, Nigeria.

		Sum of Squares	Df	Mean Square	F	Sig.
Research	Between Groups	3.235	1	3.235	1.345	.248
Productivity	Within Groups	404.088	198	2.405		

Total	407.324	199

Table 6 shows the significant influence of ICT skills on research productivity of librarians in private universities in southwest, Nigeria. The table shows that 1 is the degree of freedom and it can be seen that .248 for the ANOVA significant is greater than the significant level of 0.05. Based on the guiding rule, the null hypothesis which states that "there is no significant influence of ICT skills on research productivity of librarians in private universities in southwest, Nigeria" is rejected, while the alternative which says "there is a significant influence of ICT skills on research productivity of librarians in private universities in southwest, Nigeria" is accepted. This implies the efficiency of the ICT on the research productivity of the librarians.

Discussion

According to the survey, librarians at selected private universities in Southwest Nigeria engaged in research activities. The majority of the respondents only published research papers once a year, which is thought to be a relatively insignificant amount. This supports Lawal and Olawale's (2020) conclusion that the study area's librarians produced comparatively little research. The outcome is in contrast to Okonedo-Adegbaye (2015), findings that the research publication output of librarians in South-West Nigerian public universities was high from 2009 to 2014. With their strong information searching abilities and sources, one should anticipate that librarians would participate in more research activities.

The study also demonstrates that the majority of respondents possess the fundamental ICT skills required to make use of the ICT tools for their research activities. This is shown by the fact that they employ a variety of ICTs for their research activities, including search engines, word processors, electronic presentations, accessing and downloading e-information, downloading files from the Internet, and so forth. As some of the respondents said they did not utilize scanners and uploading devices, citing apps and google forms which are also necessary for research activities, it was also determined that the respondents needed more ICT training. These training requirements were similar to those that Bugyei, Obiri-Yeboah, and Kavi (2017) identified in a related discovery on particular Ghanaian institutions. Additionally, it was found that the use of ICT has an impact on the research productivity of librarians, particularly in areas like data collection methods, support for collaborative research, enhanced quality and quantity of literature search, enhanced data processing/analysis, and improved data communication. According to Watts and Ibegbulen (2006), the utilization of ICT tools and services in libraries is hampered by a lack of appropriate ICT infrastructure and comprehensive digital skills among library staff. It was also supported by the fact that Oduwole and Sowole (2006) identified a lack of fundamental digital literacy among library staff as one of the barriers to the use of ICTs in the library. Additionally, they encounter a number of difficulties, namely a weak ICT infrastructure, lack of personnel training, and an epileptic power supply. This is consistent with the findings from Mathew and Baby (2012).

Conclusion

The study clearly shows that the selected private university librarians in Southwest Nigeria have low levels of research output and rarely work with scholars from other institutions. Additionally, the librarians utilized a variety of ICTs for research tasks, the majority of which involved online, search engine, and search engine searching. It is also obvious that the usage

of ICT has a significant impact on librarians' research productivity. However, the Librarian have certain additional difficulties when utilizing the ICT, such as poor ICT facilities coupled with their busy schedules.

Recommendations

Based on the findings of this study, it is recommended thus:

- Librarians should also be encouraged to obtain the knowledge and skills they need to use new technology for research.
- In order to advance profession and produce more scholarly literature, librarians should make an effort to publish more research articles, particularly when it pertains to their line of work.
- In particular, the use of statistical analysis software and apps for presenting research findings and for boosting research productivity, should be encouraged.
- Library management need to be continued encouraging and organizing workshops relating to Research writing for Librarians to improve their research productivity output.

References

Adebisi, O. L. (2009). ICT availability, accessibility and resource sharing in Federal Polytechnic Libraries in South-West Nigeria. International Journal of Information and Communication Technology, 6 (2), 169-172. Retrieved on 15th February, 2017 from: https://www.ajol.info/index.php/ict/article/view/52726

Ademodi, D.T. &Adepoju, E.O. (2009). Computer skill among librarians in academic libraries in Ondo and Ekiti State, Nigeria. Library Philosophy and Practice (online journal), Retrieved on 20th March, 2017 from: http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1273&context=libphilprac.

Aguolu, C. C. &Aguolu, I. E. (2002). Libraries and information management in Nigeria: Seminal essays on themes and problems. Maiduguri: El-Inform Services.

Ayoku, O. A. & Okafor, V. N. (2015). ICT skills acquisition and competencies of librarians. The Electronic Library, 33(3), 502-523. Retrieved on May 31, 2017 from: http://dx.doi.org/10.1108/EL-08-2013-0155

Babu, B. R, Vinayagamoorthy, P. & Gopalakrishnan, S. (2007). ICT skills among librarians in engineering educational institutions in Tamil Nadu." DESIDOC Bulletin of Information Technology, 27 (6), 55-64. Retrieved on 10th January, 2017 from: www.indianjournals.com/ijor.aspx?target=dbitvolume=27

Beckett, D. & Hager, P. (2002). Life and learning: Practice in post modernity. London: Routledge.

Chisita, C. T. & Shoko, M. (2010). Harnessing the use of ICTs in Harare. Harare: Unpublished.

Diso, L. I. & Njoku, I. F. (2007). Library and information science education in Nigeria: Curriculum contents versus cultural realities. International Information Library Review, 39(2): 121-133.

Ekoja, I. (2007). Information and communication technology (ICT): Librarians knowledge, use and skills in Nigerian university libraries. Journal of Library and Information Science, 9 (1), 1- 16.

Garuba, A.R. (2007). Impact of automation on library staff: A case study of John Harris Library, University of Benin. Nigeria Library Link, 2(1), 83.

Gulati, A., & Raina, R. L. (2000). Professional competencies among librarians and information professionals in the knowledge era. World Libraries, 10(1&2). Retrieved on 15th January, 2017 from: http://www.worlib.org/vol10no1-2/print/gulati_print.html

Islam, S. & Islam, N. (2007). Use of ICT in libraries: An empirical study of selected libraries in Bangladesh. Library Philosophy and Practice (online journals). Retrieved on 15th January, 2017 from: http://www.unllib.unl.edu/LLP/Shariful.htm.

Mahmood, K. & Ajmal, M. (2007). ICT training for LIS professionals in Pakistan: A need assessment program. Electronic Library and Information Systems, 41(4), 418-427.

Marshall, S., Taylor, W., & Yu, X. (2003). Closing the digital divide: Transforming regional economies and communities with information technology (Ed.). Westport CT, USA: Greenwood Publishing.

Mathew, S. K. & Baby, M. D. (2012). Developing technology skills for academic librarians: A study based on the universities in Kerela, India. Library Philosophy and Practice (ejournal). Retrieved on 20th August, 2017 from: http://digitalcommons.unl.edu/libphilprac/702/

Nagarajan, M. (2012). Information and communication technology literacy among library professionals in the universities of Tamilnadu. Journal of Advances in Library and Information Science, 1(2), 54-59. Retrieved on 20th August, 2017 from: https://www.jalis.in/pdf/pdf_27jun/20121201.pdf

Nwachukwu, V. N. (2005). Computer skills competence among academic librarians: An imperative for computerization of Nigerian university libraries. A journal of Library and Information Science. 111 (1/2), 97-105

Ocholla, D. N, Ocholla, L., & Onyancha, O. B., (2012). Research visibility, publication patterns and output of academic librarians in sub-Saharan Africa: a case of Eastern Africa, Aslib Proceedings (in press).

Ojiegbe, N. (2010). ICT competencies of library staff at the University of Abuja, FCT and University of Jos, Plateau state. Unpublished dissertation presented to the department of library and information science, University of Nigeria, Nssuka. Retrieved on 20th August, 2017 from:

Salisu, T. M. (2002). Whither continuing professional education (CPE) for librarians? Lagos Librarian, 23 (1/2).

Sharp, K. (2001). Internet librarianship roles in a new environment. 66th IFLA council and general conferences, held in Jerusalem, Israel. August 13-18.