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DIGITAL REFERENCE SERVICES UTILIZATION IN UNIVERSITY LIBRARIES BY POSTGRADUATE STUDENTS AS CORRELATES OF RESEARCH PRODUCTIVITY

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Abstract

The study was carried out to investigate digital reference services utilization in university libraries by post graduate students as correlates of their research productivity. The objectives of this study are to examine the utilization of digital reference services by post graduate students for research productivity; the relationship between utilization of digital reference services and research productivity of post graduate students. A mixed design which consisted of correlational and descriptive survey research design was used for this study. The population of the study comprised of seventeen thousand two hundred and seventy-two (17272) posts graduate students. The sample size consisted of three hundred and eight (308) PG students representing (5%). The sampling techniques used for the study was Multi Stage Sampling Techniques. The instrument used for data collection was self-developed questionnaire. 308 copies of questionnaires were distributed, filled and returned. The data collected were analyzed using Mean and standard deviation, Pearson product movement correlation coefficient and regression analysis for hypothesis. The findings of the study revealed that digital reference services are utilized on a very high extent and high extent. The study also shows significant relationship between digital reference services and research productivity of post graduate students. It is recommended that the university management, government and other bodies should provide more funds to the university libraries for continuation of provision and utilization of digital reference services for research productivity among post graduate students.

Keywords: Reference Services, Digital Reference Services, Utilization, University Libraries, Research Productivity

1.1 Introduction

Universities are established mainly to provide learning, teaching and research works, universities in Nigeria are established to support learning, teaching, research, production of scripts, documentation, storage, retrieval and dissemination of information,

public service and clarification service. The idea, operation and policies of the university is to guide the universities to achieve the essential roles of teaching, learning, research and offering the rightful materials that form basis on which the objectives of the university are established (Radhe, 2015).

University libraries are the foundation upon which universities are built on, the library occupies a unique position in the university, as it manages the intellectual products of the university. University libraries are repository of resources and services; there are integral parts of the educational system whose primary objective is to serve its users (Oriogu, 2015). The roles of universities libraries in Nigeria are to support teaching, learning, research and development, knowledge generation and dissemination, international cooperation, storage and retrieval of knowledge and dedicated services to the communities through physical, digital and consultancy services (Asiyai, 2015).

Digital reference services (DRS) commonly called virtual reference services (VRS) or online data-based services, internet-based services, electronic services and network services are conducted online and the reference transaction which is computer mediated communication. Digital reference services in this context refers to the tasks of helping library users in finding information, answering questions, and otherwise fulfilling user's needs using internet. Digital reference services refer to network of expertise, intermediation and resources put at the disposal of a user seeking information online/networked environment. Digital reference services occur when a question is received electronically and responded to electronically (Dollah and Singh 2012). The terms digital reference services, web-based reference services, virtual reference services, internet-based and electronic reference services are used interchangeably as the terms are with similar meaning.

Digital reference services generally comprise the user of the service, the interface (e-mail, web form, chat, video conference, digital intelligent robots etc. the information professional and electronic resources (including electronic or CD-based resources, web resources, local digitized material etc.), as

well as print resources. McClennen in Oluwabilyi (2017), Digital reference services have been practiced in two modes: synchronous and asynchronous. Synchronous is a type digital reference mode which is characterized by real-time two-way communication between the question asker and answerer, using mechanisms such as chat, 'instant messaging' or 'voice over. The poor research productivity in universities might be because of lack of provision, adaptation, technology, ICT gadgets and lack of utilization of these digital reference services. It is against this background that the researcher seeks to examine digital reference services utilization in universities libraries for research productivity.

1.2 Research Questions

1. To what extent do post graduate students utilize digital reference services in university libraries?
2. What is the relationship between utilization of digital reference services and the research productivity of post graduate students in university libraries?

1.3 Hypotheses

H02: There is no significant relationship between the utilization of digital reference services and the research productivity of post graduate students in university libraries.

2.1 Literature Review

2.2 Reference Services and Digital reference services

In this era of information and communication technology (ICT) the adaptation, provision and utilization of reference services remarkably experienced rapid changes which have tremendously changed the information seeking attitude of researchers globally. Digital reference services are starting point for research to be carried out by library users and all types of researchers in any field of study in

this 21st century, be it for thesis, dissertations, projects, workshops, seminars, journals articles among others.

According to Tutu (2017) Digital reference services effectively provide background information on subjects, break barriers of geographical distance between users and the library, provision of access to electronic tools such as abstracts, indexes and catalogues provisions of timely current awareness services (CAS) and topics, and also aid library user seeking information, through the use of different channels. The new trend in the use of technology is the adoption of digital information services in university libraries and among different types of researchers (Connaway & Radford 2010).

The provision, adaption and utilization of digital reference services are vital in the role the university libraries play and the services they offer to the university community. Digital reference services are online or internet-based services or queries and answer services that link patrons with digital reference librarians who has specialized skills; digital reference services which can also be refer to as virtual reference services are services that are known as *Ask a Librarian* Services. Digital reference services use information professionals has mediators or a digital librarian to simplify materials needs by the users and to determine the access to the information needed by the library clientele, as well as to provide answers to the user's queries, digital reference services are fast becoming the most part of nowadays essential library services, especially in university libraries (Dollah and Singh, 2015). Digital reference services are used interchangeably with web-based reference services, online-based services and virtual reference services which the services are offered by skilled library staff through the online media.

The services can be delivered through an information infrastructure, such as the

internet. Lankes in Dollar and Singh (2015), further explained that digital reference services are internet-based question and answer services that connect users with individuals who possessed specialized subject or skill expertise, digital reference services refer to a network of expertise, intermediation and resources put at the disposal of a user seeking answers online/networked environment. Reference and User Services Association (RUSA) of the American Library Association (2014), said digital reference services are information consultations services in which library staff recommend, interpret, evaluate and/or use information resources to help others to meet information needs. These reference transactions can take place in person or via the telephone, e-mail or virtual reference technologies; librarians are creating websites, answer archives and links to answer to frequently asked questions of all designed to anticipate user questions and aid people find information independent. Bertot, McClure and Ryan, (2010), saw digital reference services as services that occur when a question is send and received automatically and responded to electronically, virtual reference services include: Real life chat, e-mail, Ask a librarian service, video conferencing, digital reference intelligent robots, web form etc.

The elements of digital reference services are the users of the service on site or remote patrons, the interface, in the form of chat, e-mail, web form, video conferencing, digital robots etc. librarians or information professionals and Information materials, print or electronic. According to Matusiak (2012), components of digital reference services are storing resources in digital forms, which allow online access to library users at several locations anytime, anywhere, and at comfort of their home, at the office, in the class, an even in a moving vehicle. He further explained that digital Reference Services are innovation of the traditional reference services that depends on manual solution to always provide users

with the needed information. Hatakka (2010) declared that digital reference services refer to all roles play by digital reference librarian to provide the information resources needed by the library users in electronic format; virtual reference services are the most essential services provided in the modern library system, they are observable expressions of the library's objectives and operations.

According to the ALA Glossary of library and information science (2014), digital reference services as those online library works which are directly concerned with assistance to library users in accessing and retrieving the rightful information and in using electronic resources of the library in writing research. Digital reference services in university libraries should be considered as the most crucial aspect of library services which satisfy the needs of clientele. Digital Reference Services have improved beyond traditional services; the emergence of digital reference services brought enough solutions to meet the user's information needs in the contemporary society. The digital reference library services are electronic or web-based library services where information is selected, acquired, processed, organized, stored and retrieved in electronic format. The patrons of digital reference services are the worldwide users who facilitate the access to all digital services according to the needs of users (Singh, 2012).

Digital reference professionals are also using web to gather enough information to serve its users; digital reference service is extended beyond the physical library and designated reference desk hours, to opening the building for 24-hours access and beyond library walls. Also, according to Singh (2012), stated the elements of digital reference services, these elements include: the users of the services, the interface that's email, web form, chat, video conference, and digital robots and other. Many scholars have used the term asynchronous and synchronous as the

two models of digital reference services (DRS). Singh (2015), in their study discussed the two models and the interface or channels in which these models are been used to answer user's queries as: Asynchronous Mode which involves time delay between the question and answer has the following services. E-mails: This is still the major format for online information delivery, user sends the librarian an e-mail with a reference query, supplying whatever information he or she feels is necessary and the librarian may reply by e-mail, telephone, fax, correspondence, etc.

Web Forms: Web form transactions as found within the UK public library service, asks a Librarian, can only be initiated from a designated web site, where users must respond to specific queries in addition to asking their questions. To send the form, which will usually be received by the library in the form of e-mail, users must click on a button specifically designated for that purpose. AskA Services: AskA Services are usually corporate-sponsored web sites that allow users to ask questions and receive answers for free from public information located mainly on the World Wide Web or from proprietary databases and networks of field experts.

Synchronous mode which takes place in 'real-time' with an immediate response to the queries has the following services, text-based chat or Instant Messaging is where library's users and digital librarian can 'speak' to each other in real time on the Internet using special text-based software; An example is the Live Help Service offered by Gates head public libraries, which uses Swiss software, Click and Care. The transaction involves a split web screen, in one screen user's type question and can instantly see librarians' responses, in the second screen; librarians can call up web pages or other electronic references where the required information can be found (Singh, 2012).

Singh further explained that though real chat digital reference service mode is associated with the 24/7 service model, this level of service is often impossible for single libraries to implement. Videoconferencing or web-cam services: this form of digital reference includes the visual element, which may be an antidote to the communications problems inherent in the more text-based services. Librarians and users can use both text and speech for reference transactions; instead of a window for the textual exchange, there is a window in which librarians and users can see each other while conducting a face-to-face interview. Digital Reference Robots: Digital Reference Robots essentially use artificial intelligence to respond to questions. The most well-known of this type of service is Ask Jeeves available on the Internet.

The other form of digital reference service is collaborative digital reference service where two or more libraries team up to offer reference services using any of the above formats. With digital reference resources and services, the university libraries can now achieve its main goals of helping students, researchers and staff of its institution to achieve academic excellence by helping them with easy access to information resources and help them find answers to their queries. Ifeyinwa and Anyalebechi (2017), opined that virtual reference services have become a significant movement in the world of university libraries, the university libraries also change from the traditional reference services to a digital reference service. Gama (2012), in his opinion said digital reference services are used for interacting and communicating with users in electronic society by utilizing computer and internet technology and the nature of reference and information services. Digital reference professional or librarians does enough on their part to assist the location, accessibility and use of information services by users; it starts from collecting the right services and

management of the collections to the proper connecting of collected services with users (Gama, 2012). Digital reference services utilization is the main direct way that will help postgraduate students in any universities to succeed in their research activities and to have research productivity nowadays.

2.3 Utilization

Information is utilized based on need, availability, accessibility and effectiveness, but the components - user, aim availability, process and user satisfaction must interrelate to enhance utilization of information services. Utilization is basically aimed at satisfying informational needs of the user; acquire through experience, education, entertainment values etc. It may take the form of actual use of books and other information services like web-base to retrieve, process, store information, or receiving information services the Internet (Tofi, Agada & Okafor, 2020). Full utilization of these services will aid research productivity of post graduate students research and services to the university community. Mesagan, Eseadi and Omekwu (2022) explained that utilization is the process where people uses online information services, the feature of the utilization is to make use and continue to use the services by the researchers. According to Ezekwe (2019), utilization of digital reference service is putting into post graduate students and also the general objectives of the university that's learning, teaching use of acquired materials.

The scholar alleged that utilization differs from individual to individual and from one organization to another based on their peculiarities and information needs. The researcher identifies four basic features which lead to effective utilization; these are: objective, availability, process and user satisfaction utilization of library and reference services involve effective usage of the materials and services by the clientele

which can be enabled by allowing access to materials online to users. Effective utilization of reference services by post graduate students enhances research productivity, knowledge and overall university activities. However, utilization of rightful virtual reference services plays a crucial part in the achievement of academic objectives. Azubuike (2014), in his study opined that utilization of digital reference services as becomes possible when they are made available and easily accessible provided by university libraries for effective retrieval and usage.

Acquisition, provision, adaptation and utilization of digital reference services is an essential way of achieving research productivity and study activities of postgraduates and other researchers. These services are used for academic activities such as teaching, learning, assignments, examinations and research works. Moreover, utilization of digital reference services in university libraries are not far from happenings in the world of information in the contemporary society which is the digitalized world. Hernon and Altman (2015), saw that virtual reference services are fast increasing their delivery collection, organization, storage, and dissemination of services online. The efficiency and effectiveness of virtual reference services of library as a teaching, learning and research tools are strong-minded by the research productivity of the users with important and the rightful time in which information is provided (Efua and Cynthia, 2011).

The researcher stated that post graduate students, other researchers and professionals have their different reasons of using digital reference services. According to Hatakka (2010), in his study gave reasons for use and reuse of research web-based services as they save time of the scholars, update and cost less. Post graduate students utilize digital reference services for their research activities,

studies, papers, journals, articles and assessment (Adetimirin, 2012). Similarly, Usuka, Odili and Ajibo (2022), in their study point out that the post graduate students make use of virtual reference services for their assessment, and research works. Digital reference services are the most used in the library especially in university libraries as they are costless, save time of the user, convenient and satisfaction of client's needs.

2.4 University Libraries

Universities are the most crucial and higher tertiary institutions that aimed at providing adequate sources, resources, services and knowledge for learning, teaching and research. The word university is derived from a Latin word "Universitas magistrorum scholarium" which means community of teachers and scholars; a university is an institution of higher education and research which awards academic degrees in several academic disciplines. University libraries are libraries that are found within the universities which are set up primarily to support learning, teaching and research and to serve mainly the students, lecturers, workers and university community at large. Sambe (2012) said that university libraries are built to sustenance the basic roles of universities, teaching, learning, and research and to support the university community.

Precisely, the main intention of any university library is to content the overall information needs of the patrons; university libraries are the most essential structure of the University. Sambe (2012) opined that university libraries are built to sustenance the basic roles of universities, teaching, learning, and research and to support the university community. Ekere (2014) saw university libraries as libraries that support the goals of the university which is to promote teaching, learning and research. The scholar further explained that university libraries have long been recognized as the "hearts" of their

universities to fulfill their mission of supporting the educational objectives of their parent bodies, which include teaching, learning, research, and cultural growth, the libraries had to grow and sustain standard books, journals, articles, electronic materials and audio-visual collections for learning, teaching and research.

University libraries are libraries attached to universities; university libraries are the most essential structure of the university. Gbaje and Okojie (2010) declared that university libraries provide digital reference services to enable undergraduates, post graduate students, teaching staff, researchers and university community to evaluate, locate and access information using different channels. Adamu, and Illiyasu (2019), stated that university programmes of such institutions of learning as it contributes to the total growth of its client's group by expanding their intelligent, teaching and training them to study and carry out research activities

Abubakar, (2011) in his study said university libraries are main entrance opinions in the running of reference services and for excellence teaching, learning and studying; virtual services are information bearing channels in works, patterns and electric form used by reference librarians to deliver access to exact information for clients while, virtual reference services are services that deal with the aid given to users in finding materials, responding to questions, and then satisfying library patrons information needs. Due to the technological changes in knowledge especially in the educational settings and background of their users, university libraries are established to breach these gaps by providing innovative, learning, teaching and research services that will support and strengthen the academic works of the clients.

2.5 Research Productivity

Research is a process of looking for a solution to an existing problem. It can also be referring to as investigation aimed at finding adequate answers to a problem. Research is derived from a Latin word 'recherchia' which mean to seek. Mole(2019), considered research as a systematic investigation aimed at providing adequate solution to an already known problem. Ifedili and Ominnu (2012), opined that research as an effort to inquiry or examination; especially: investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws. It is a thoughtful, serious and systematic investigation of facts that are crucial for developing theories, revising existing theories in the light of the new facts, application of the existing theories to evolve dependable solutions to the problems that challenge human life and human society. Clifford (2012), in his study said research is to search and research problems, also finding and suggesting solutions, collecting, analyzing, interpreting and evaluating data and making summary and conclusion.

The goal of research is to solve problems and discovers new knowledge, facts, concepts and phenomenon; research is very vital and compulsory for undergraduates, postgraduates, and lecturers and in all sectors of life, post graduates are requiring to have enough knowledge about their disciplines, fields of study and as well carry out research in their field of study. Research is to systematically investigate and finding solutions to a problem. Jayata and Priyanka (2015) stated that research is logical method of collecting data, analysing the facts and drawing conclusions in the form of solution to a specific problem. Bently and Kyvik (2013), in his study noted that research is systematic investigation into any aspect of education, knowledge acquired from research when

translated into practice contributes to education through improvement in educational outcomes and refinement in skills, leading to improved standards of societal development.

Kerlinger (2010), states that research is scientific, experiential, systematic and serious enquiring of evidence, answering of queries and proffering solution to a problem. Research is also defined as a planned systematic, facts, scientific, information-based investigation into unambiguous issue with the aimed of findings appropriate solution to a problem (Recker, 2021). Yadav, Verna and Singh (2017), in their studies said that research is the essential and major role of any higher institution, organization and faculty members of the higher education are positive to the development of research by the creating a research team consisting of senior and junior scholars. Burn (2014), says that research is generally known in academic environment, which is a necessary course for all levels, undergraduates and post graduate students in colleges, polytechnics and universities globally. Furthermore, the goal of any research is to increase the knowledge of the subject and to use the results of the research to improve on the specific situation and proffer solutions to a research problem. The outcome of any research determines the quality of literature resources used.

Research productivity can also be referred to as the output or performance of research also productivity is to examine the effect and practices of research (Caminiti, Lezziand and Ferrari 2015). Recker, J. (2021) opined that research productivity is a degree of measures and quality of practical reports, seminar papers, projects, thesis, and infrequent papers that people or a group produces for the organized public. In their research study, research productivity is categorized by the overhead stated events of the perception; research productivity is a measure of the research published works of

the people or tertiaries. According to Yadav, Verna and Singh (2017), said research productivity is research outcome and a scientific input and output of research findings. There will be no need engaging or carrying out research without having a greater productivity. Post graduates involve in research in fulfilment of their degree program, for seminars, and conference papers for promotion and also to solve existing problems globally; those that involved in research are refer to as researchers, post graduate students are researchers who successfully completed undergraduate degree level and are further taking study at tertiary institution for research and for greater research productivity.

Researchers in the universities like lecturers and undergraduates. Abiddin, (2012) opined that lecturers in the universities continually engage in research activities in their various areas of specialization, this is part of the academic exercise they have to offer universities for their ultimate development; it also forms part of the necessary requirement for their promotion. Undergraduate students also embark on research, which is referred to as project report and is supervised and submitted to the departments of the universities in partial fulfillment of the first degree under study. The same applies to post graduate students pursuing post graduate diplomas (PGD), Masters and (PhD) which this study is concern about; post graduate students are researchers who embark on research for their papers, articles, journals, assessments and especially for project in fulfillment of their post graduate degree requirements and for research effective and productive (Isangedighi, 2012). Libraries are becoming better in handling challenges of providing timely and precise information services to users with regularly development of information needs.

2.6 Theoretical Framework

Theory of Technology Acceptance Model by Davis 1989

The theory of Technology Acceptance Model by Fred Davis has very relevant attributes connected to this study. The new trend in society is widely accepting and recognizing information communication technology globally, the theory foresees clients' acceptance and adoption of (ICT) and computer gadgets in every sector and in academic environment for easy, convenience and flexibility in learning, teaching and research. The theory proposed its perceived ease of use perceived usefulness is key factors of a person's objective to utilize ICT. Characteristics such as quickness, privacy and data safety, exactness, sustainability etc. of TAM are very connected to this work as the study focused on digital reference services like real chat, email, digital robots, video conferencing etc. utilization in university libraries for research productivity.

3.1 Research Method

The study was investigated in the

universities. Mixed research of descriptive survey and correlational design was for the work. The population of the study consisted of all registered post graduate students in the 2019/2020 academic session. The total population of the study was 17,272 registered postgraduates. Multistage sampling technique was used to select 6144 and 308 respondents who constituted the sample of the study were drawn from the 6144 using 5%. Questionnaire was the instrument used for data collection and was administered by the researcher to the postgraduates in the school and collected on the spot. The data generated were analyzed using Mean and Standard Deviation, Pearson Product Moment Correlation Coefficient and Regression Analysis and T-test.

4.1 Results and Analysis

The results of the data analysis are presented in tables in tandem with the specific objectives, research questions that guided the study. 308 copies of research questionnaires were distributed and 308 copies were all returned.

Table 1: Mean and Standard Deviation of PG Students on the Extent of Utilization of Digital Reference Services for Research Productivity

S/ N	Item Statement	Univ Jos		Fed Univ Lafia		Benue State Univ		Mean Sum	R	Dec	
		X	±	X	±	X	±				
1	E-mail services involve time delay but I prefer using it for my research work	3.68	.46	3.17	.88	3.50	.72	3.57	.63	1 st	V H E
2	I use Aska Services to ask questions and receive answers freely	3.40	.59	2.74	.93	3.19	.82	3.26	.74	3 rd	H E
3	I use Video Conferencing more because it gives access for text, speech and I can see the librarian responding to my questions.	3.48	.57	2.46	1.0 9	3.11	.92	3.25	.83	4 th	H E

4	I use Web Form because it allows me to answer queries in order to ask my questions	3.54	2.33	3.15	.81	3.13	.96	3.37	1.89	2 nd	H E
5	I prefer using Text base chat than Email services	3.12	.66	3.02	.93	3.21	.95	3.13	.79	9 th	H E
6	Digital Reference Intelligent Robots answer queries faster	3.20	.72	3.02	.98	2.69	.89	3.03	.83	10 th	H E
7	Ask a librarian service is better as it involves dealing with the librarian directly	3.12	.68	3.35	.66	3.04	.82	3.13	.72	9 th	H E
8	I prefer online Current Awareness services as they are faster	3.15	.73	3.23	.74	3.17	.79	3.17	.74	7 th	H E
9	I prefer Internet services because it is convenient and can be accessed at anytime and anywhere.	3.14	.76	3.20	.92	3.29	.77	3.19	.78	6 th	H E
10	I prefer Online Inter-Library Loan Services than visiting the physical library for loan	3.23	.75	3.02	.95	3.07	.85	3.16	.81	8 th	H E
11	World Wide Web is preferable to others	3.20	.73	3.05	.82	3.29	.78	3.21	.75	5 th	H E
12	Virtual Reference Desk is better than others	3.04	.85	3.12	.89	2.96	.83	3.03	.85	10 th	H E
13	Online question and answer services are better than visiting the physical library	3.11	.77	2.76	.95	2.93	.88	3.02	.84	11 th	H E
14	I do use Collaborative networks for references	3.06	.87	2.74	.99	2.55	1.08	2.87	.97	12 th	H E
Cluster Mean						3.17	.86			HE	

X = Mean; $\pm$ Standard Deviation; Mean Sum = Mean Summation; *R* = Rank; Dec = Decision; *VHE* – Very High Extent; *HE* = High Extent

Table 1 present's results of the extent post graduate students utilizes digital reference services in universities in North-Central, Nigeria. The result shows that to a high extent (3.54) e-mail services are utilized for research works. While the other digital reference services are utilized to a high extent with 3.37 - 2.87 mean scores such as use of Web Form because it allow me to answer queries in order to ask my questions, use of Aska Services to ask questions and receive answers freely, use of Video Conferencing because it give access for text and speech, use of Internet services because it is convenient and can be accessed at anytime and anywhere, use of online Current Awareness services, use of Online Inter-Library Loan

Services than visiting the physical library for loan.

Generally, the cluster mean $3.17 \pm .86$ is an indication that the digital reference services are utilized to a high extent by the post graduate students. The result also reveals that the standard deviation scores $\pm .63 - \pm .1.83$ are far from the mean scores that range from 3.70 - 2.88. This suggests that the postgraduate students are far from each other in their responses on utilization of digital reference services. This finding suggests that university libraries in North-Central, Nigeria have advanced their library services to include digital library service platforms that the PG students consult for their research works.

Table 2: Pearson Correlation Coefficient and Regression Analysis on the Relationship between Utilization of Digital Reference Services and Research Productivity

Variables	Mean	Std Dev	N	R	r ²
Digital Reference services	46.3035	6.60791	308	0.57	.38
Level of Research Productivity	55.0383	10.21803	308		

Std Dev = Standard Deviation, N = Population size, r = Correlation Coefficient, r² = Coefficient of determination

Table 2 presents the result of the relationship between utilization of digital reference services and the research productivity of post graduate students in universities in North Central, Nigeria. It reveals that the correlation coefficient [r] is 0.57. This indicates that there is a positive medium relationship between utilization of digital reference services and research productivity of the post graduate students. This finding implies that to a moderate level, utilizing digital reference services improves the level of research productivity of post graduate students. The result also reveals

that the coefficient of determination [r²] associated with the correlation coefficient [r] of 0.57 is .38. This result implies that 38% utilization of digital reference services is associated with research productivity level of post graduate students.

H02: There is no significant relationship between the utilization of digital reference services and research productivity of post graduate students in universities in North-Central, Nigeria.

Table 3: Regression Analysis on the Significant Relationship between Utilization of Digital Reference Services and Research Productivity

Model	Sum of Squares	Df	Mean Square	F	Sig	Decision
Regression	2081.399	1	2081.399	20.559	0.00	Significant
Residual	63173.680	312	101.240			
Total	65255.080	313				

df = of freedom, Sig = Level of Significance p 0.05, F = F-ratio

Table 3 shows that the obtained F-ratio 20.559 is significant at the 0.00 level. The null hypothesis was rejected because 0.00 is less than the 0.05 level of significance set for the study. Therefore, it can be inferred that there is a significant relationship between utilization of digital reference services and research productivity of post graduate students in universities in North-Central, Nigeria.

5.1 Discussions of Findings

Digital reference services are utilized to a high extent by post graduate students for research productivity especially Email services, real chat services, video conferencing, world wide web etc. which are utilized to a very high extent while, the remaining services like current awareness services, Aska services etc. are utilized to a high extent by post graduate students. Tofi, Agada and Okafor (2020) observed that Email services, real chat services, video conferencing etc. are the most highly used services by postgraduates for research works and in any research environment.

The findings on the relationship between utilization of digital reference services and research productivity of post graduate students revealed the positive medium between the utilization of digital reference services and research productivity; this suggests that to a reasonable level utilizing digital reference services improve the level of research productivity of post graduate students. Anderson (2021) in his study opined that correlation indicate a predictive and positive statistical relationship that can be feats in practice, whether fundamental or not.

Conclusion and Recommendations

Universities cannot fulfill their objectives of teaching, learning and research without university libraries which are the engine house of every institution. The objective of university libraries is to make

available, current and accessible the needed adequate quality informative materials and services that would support students in continuous assessments, teaching, learning and research activities. In this 21st century whereby everything is digitalized, this study encouraged the adaptation, provision and utilization of digital reference services by the universities management and university libraries for post graduate students to create a positive impact in their research productivity, the study also added to the existing literature works of digital reference services utilization and research productivity of post graduates. However, researchers on their own part are encouraged to utilize these digital reference services provided by the universities and university libraries for their research activities.

Based on the major findings the following recommendations were made:

1. The university libraries and managements should improve on the university network or internet connectivity so that researchers who cannot afford data subscriptions to access these services can make use of the school networks for their research works. The internet access should be free and accessible to the students, most especially post graduate students who engage in research.
2. The government and other bodies like Tertiary Education Trust Fund (TETFUND) should provide more funds to the universities and university libraries for continuation of provision and utilization of digital reference services for research productivity among post graduate students.

References

- Abiddin, N. Z. (2012). *Post Graduate Students Perception on Effective Supervision: A case study at one public university in Malaysia. International Journal for Cross Discipline Subjects in Education (IJCDSE)*. 3 (1), 635-639
- Abubakar, B. M. (2011) Academic libraries in Nigeria in the 21st century: *Library philosophy and Practice*: <https://www.researchgate.net/publication/277262052>
- Adamu, M.S. & Illiyasu, J. A. (2019). *Assessment of digital reference resources and services in Federal University of Technology Library, Minna, Niger State, Nigeria*. Unpublished Master thesis from federal University of Technology Minna, Niger State.
- Adetimirin, A. E. (2012). ICT literacy among undergraduates in Nigerian universities. *Journal of Education and Information Technologies* 17, 381-397
- American Library Association (2014)
- Anderson, S. (2012). *Corporate finance and accounting financial analysis*: <https://www.investopedia.com>
- Asiyai, R. I. (2015). Improving quality Higher Education in Nigeria. *Online journal of education* 4(1).
- Azubuike, C. G. (2014). Accessibility and utilization of reference resources and services by students in colleges of education in Anambra and Enugu states of Nigeria: Department of library and information science university of Nigeria, Nsukka.
- Bemtly, P. & Kyviki, S. (2013). Individual Differences in Faculty Research Time Allocations Across thirteen (13) Countries: *Research in Higher Education*. 54 (3), 329-348
- Bertot, J. C., McClure, C. R. & Ryan, J. (2010). *Statistics and performance measures for public library networked services*. Chicago: American Library Association.
- Burn, R.B. (2014). *Introduction to research methods*: (2nd ed.) Melbourne Longman Cheshire.
- Caminiti, C. Lezzi, E. & Cerrari, C. (2015). *A method for Measuring Individual Research Productivity in Hospitals: Development and Feasibility*.
- Clifford, W. (2012). The values of educational research to the classroom teacher. *Journal of educational research* 16 (3), Published online 17 Dec 2014. <https://doi.org/10.1080/0022067192710879779>
- Connaway, L. S., & Radford, M. L. (2010). Virtual Reference Service Quality: Critical Components for Adults and the Net-Generation. *Libri: International Journal of Libraries & Information Services*, 60(2).
- Dollah W. K. & Singh D. (2015). *Digital reference services in Academic libraries*. Information science association
- Efua, A. & Cynthia, H. K. (2011). Social networking: A tool to use for effective service delivery to clients by African libraries meeting: 183- *African libraries not just place but interface- Africa section*. <https://www.researchgate.net/publication/26819569>

- Ekere, F. C. (2014). *Administration of Academic Libraries*. A Book of Reading.
- Ezekwe, F. A. (2019). Availability and Utilization of information and communication technology resources by undergraduate library users in Anambra state university libraries, Nigeria.
- Gama, U. G. (2012). Who is an ideal reference librarian? *Journal of librarianship*: 4 (9), P 16.
- Gbaje, E. S. & Okojie, V. (2010). Users Oriented Access to Knowledge initiatives in Nigerian University Libraries:<https://www.laistonline.org/u9>
- Hatakka, M. (2010). Use of internet resources to improve education delivery: A case study in bangladesh. *Proceedings 7th European conference on e-learning*, Ayia Napa Cyprus. <https://www.electronicgovernment.se/research/publications.asp>
- Hernon, P. & Altman, E. (2015). *Assessing service quality: satisfying the expectation of library customers*. Chicago: American Library Association
- Ifedili, C. & Ominunu, S. (2012). Supervision Undergraduates Final Year's Projects Requirement in Nigerian Universities. *The way out of the world Asian Culture and History*. 4 (2), 153-160
- Ifeyinwa, K. O. & Anyalebechi (2017). Awareness and use of reference and information service amongst library users in University libraries in two states in Nigeria. *Journal of Applied information science and Technology* 10 (30), 109-116
- Isangedighi A. J. (2012). Educational research in context. In A.J. Isangedighi (Eds) *Essentials of research and statistics in Education and social sciences*, (Pp.18-20) Calabar Etinwa Association.
- Jayanta, K. N. & Priyanka, S. (2015). *Fundamentals of research methodology: problems and prospects*. <https://www.researchgate.net/publication/309732183>
- Kerlinger, F. N. (2010). *Foundation of behavioural research*: New York Holt remehartand
- Matusiak, H. (2012). Perceptions of Usability and Usefulness of Digital Libraries. *International Journal of humanities and Artscomputing*, 6(3), 133-172.
- McClennen, M. (2002). 'Software, systems and standards in digital reference: A research agenda'. Available at <http://www.ipl.org/div/papers/symposium2002/systems.html>. Accessed November 19, 2002.
- Mesagan, F. O., Eseadi, C., & Omekwu, C. O. (2022). Influence of gender and expected competencies on access to and utilization of cyberspace resources and services for research by postgraduate students. *Education and Information Technologies*, 27(5), 6157-6171.
- Mole, A. J. C. (2019). *Practical Guide to Research in Library and Information Science: University of Nigeria press Ltd.*
- Oriogu, C. D. (2015). Assessment of internet use in the provision information to

- students in University Libraries in Nigeria: A case study of Afe Babalola University Library, Ekiti state, Nigeria. *Advances in Social Sciences Research Journal*. 2 (1).
- Quinn, S. (2014). ALA glossary of library and information science. <https://oi.org/10.14738/assrj.21s-827>
- Radhe, S. S. (2015). Roles of Universities development of civil society and social transformation: *Proceedings of international Academic conferences*.
- Recker, J. (2021). *Scientific research in information systems: a beginner's guide*. Springer Nature.
- Sambe, M. T. (2012). *Availability and Utilization of Library Oriented Software Packages in University libraries in North Central Zone of Nigeria*.
- Singh, N. K. (2012). Digital Reference Services in University Libraries. A case study of the North Indian: *International journal of library and information studies*, 2 (4), 1-17.
- Tofi, S. T., Agada, E. O. & Okafor, C. J. (2020). Utilization of Digital Reference Resources and Services by Post Graduate Students in University Libraries in Benue State, Nigeria *International Journal of Research and Innovation in Social Science (IJRISS)* 4 (4) 2454-6186
- Tutu, J. M. (2017). Provision of digital reference services in academic libraries in Kenya: a review. *Regional Journal of Information and Knowledge Management*, 2(1), 16-28.
- Usuka, E. I., Odili, C., & Ajibo, C. A. (2022). Provision of Digital Reference Information Resources for Effective Research of Postgraduate Students in University Libraries in South-South Nigeria. *Library and Information Science Digest*, 16(1), 29-39.
- Yadav, S. K., Verna, M. K. and Singh, S. N. (2017). Research Productivity of Mazoram University: *Journal of Library and Information Technology*. 40 (3), pp. 169-175