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PREDICTORS OF ELECTRONIC INFORMATION RESOURCES UTILIZATION BY RESEARCHERS IN AGRICULTURAL RESEARCH INSTITUTES, KWARA STATE, NIGERIA

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ABSTRACT

Advancement in technology has resulted into increasing use of electronic information resources. This study examined the predictors of electronic information utilization by researchers in agricultural research institutes in Kwara State, considering two variables of Unified Theory of Acceptance and use of Technology (UTAUT), that is performance expectancy and effort expectancy. The population of the study consists of all researchers in research institutes in Kwara State which is 201. Survey design was adopted with the use of questionnaire for data collection, 172 questionnaires were shared out of which 140 were returned. The data collected were analyzed using descriptive statistics of frequency count and percentage and arranged in tabular form. The study reveals that e-journals, e-databases, e-books and CD-ROM are available, and are mostly used by researchers. Also, the result established that majority of the respondents use e-journals, e-books, e-databases to some extent. Based on performance expectancy, using EIR enables researchers to accomplish tasks more quickly, improve their research performance, enhance their effectiveness in research, increase their research productivity, support critical aspects of their research work; and make it easier for them to do their job; also, based on effort expectance of electronic information resource, respondents agreed that learning how to use EIR is easy for them; using EIR improves their skills; easy to understand and very easy to use. The challenges against effective utilization of e-resources include poor internet services (80.7%), inconsistent power supply (75.7%), poor awareness of library resources (51.4%) and poor funding (67.1%). However, the study also revealed that majority of the researchers have their laptop, at the same time have requisite knowledge to use e-resources. The researcher suggested timely subscription of internet and fee-based databases to ensure continuous access of e-resources. It was also recommended that stand alone generator and or solar power should be considered as alternative source of power, better funding, and improved awareness etc. these will go a long way to enhance research activities in the Agricultural Research Institutes, Kwara State with the use of electronic information resources.

Keywords: Agriculture, effort expectancy, e-resources, Library, performance expectancy, technology.

INTRODUCTION

The role of agriculture in the economic development of a nation cannot be over emphasized. Agriculture provides food for the growing population, raw materials for the industries, job opportunities for the populace, foreign exchange for the country etc. Agricultural policies and programmes are formulated by government to guide the sector, for the improvement and generation of new agricultural technologies. These policies and programmes need constant review, and this can best be achieved through continuous research. The successive government in Nigeria realized that agricultural research can bring the desired economic growth in the nation, and has taken the research seriously. This was supported by Okere (2013) who reported that federal and state governments have relentlessly supported agricultural research by establishing different types of research institutes, universities and schools/colleges of agriculture. In Nigeria, different agricultural research institutes with specific mandates were established by Federal government. These institutes have a library to support research activities by acquiring, organizing, creating awareness, disseminating different forms of agricultural information resources and documenting research reports.

With this development, libraries are not acquiring printed books and journals alone but also have electronic information resources (EIR) in their collection which provide access to various learning resources in electronic form (Kenchakkanavar, 2014). The term electronic information resources (EIR) can be described as information resources that are not in print formats, but in soft, non-print format that can be accessed only through electronically manipulated machines such as computer machines, CD-ROM readers, opaque readers, projector, and so on (Obaseki, 2014). The growing supply of the electronic information resources in the libraries had facilitated effective search for materials needed by scholars.

Also, utilization of the electronic information resources refers to the process whereby users apply electronic information resources to meet their information needs. Ibrahim (2014) opined that use refers to activities which measure the worth of an item to a library or an information center. The use of a library can be examined from the demand of its resources, and services. Thus, whenever users have no demand for the resources and the services of a library, it means that the library cannot meet their information needs. It could be assumed that, the use of these EIR by the information users is determined by some factors such as availability, accessibility, performance expectancy; effort expectancy; social influence; and facilitating conditions etc. Based on the important contribution of library to research and the importance attached to research by Nigeria government most especially agricultural sector, Agricultural Research Institutes in Kwara State acquired and subscribed to a number of e-resources. In order to enhance acceptance and increased usage of the EIR, it is important to understand how users make decisions on the use of EIR. There are factors that aid users to take decision on the adoption and utilization of a particular e-resources, these includes availability, accessibility, finance, robustness, motivation, quality, recency of information, ease of use etc. There is need for proper understanding of these factors so as to identify the level at which each of the factors is affecting the use of e-resources. Understanding these factors will reveal the strength and weakness of the use of e-resources and so help stakeholders to know areas that need improvement in order to enhance the use of e-resources.

Agricultural research institutes are agencies under Federal Ministry of Agriculture established to carry out research with a defined mandate towards achieving food security in Nigeria.

There are three of such agricultural research institutes in Kwara state, the Nigerian Stored Products Research Institute (NSPRI**),** the National Centre for Agricultural Machination (NCAM) and the Agricultural and Rural Management Training Institute (ARMTI). Nigerian Stored Products Research Institute is located in Km3, Asa Dam Road, Ilorin, Kwara State. NSPRI have the mandate to conduct research into the post-harvest handling of agricultural produces. This is to reduce postharvest loss and ensuring availability of quality, quantity and save agricultural produce throughout the year. National Centre for Agricultural Mechanization is located in km 20, Ilorin-Lokoja highway, Idofian, Kwara State. The overall mandate of the NCAM is to mechanize Nigeria's agriculture by developing simple technology that reduces drudgery (hard work), increase farm productivity and improves farmers' efficiency and their income. The mission of Agricultural and Rural Management Training Institute is to identify and analyze management problems and needs and develop appropriate interventions for improving managerial practice in the Agricultural and Rural Sector.

To achieve their mandate, agricultural research institutes carryout continuous research, so these institutions need well-equipped and functional library that can meet the information needs of researchers. The inspiration to carry out this research is borne out of the intention of the researcher to establish the true position of Agricultural Institutes on adoption and use of e-resources. That is, the available e-resources, factors that determine their adoption and use, and challenges affecting effective utilization of e-resources. Among the numerous technology theories, this study adapted Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT aimed at determining factors affecting the adoption and use of Information technology. These factors include performance expectancy, effort expectancy, social influence and facilitating conditions.

Electronic resources are growing in its acquisition and usage, also technology is advancing, new products are introduced, new databases, new and improved software and hardware are developed, new strategies of accessing information are introduced, therefore, there is need to continually examine factors that determine the adoption and use of resources. Also, it has been observed that researchers in the agricultural institutes seem not to optimally utilize electronic information resources that are available to them; despite the huge resources invested in putting them in place. Could it be that the available e-resources are not relevant to meet the information needs of researchers, if relevant, what are those factors that determine their adoption and use, what is the level of researchers' utilization of e-resources, what could be the hindrance towards their effective use? So with these, it has become imperative to examine the predictors of electronic information resources utilization by researchers in agricultural research institutes in Kwara State.

The broad objective of this study is to examine the predictors of electronic information resources utilization by researchers in Agricultural research institutes in Kwara State. The study will specifically:
 i. Identify the available EIR resources in agricultural research institutes, Kwara State.
 ii. Examine the predictors of electronic information resources utilization by the researchers.
 iii. Determine the extent to which agricultural researchers utilize the available EIR
 iv. Identify factors militating against effective utilization

The following research questions were formulated to achieve the objectives of the study:

   i.   What are the available EIR in agricultural research institutes in Kwara State?
   ii.   What are the predictors of electronic information resources utilization by researchers?
   iii.   To what extent are researchers using electronic information resources?
   iv.   What are the factors militating against effective utilization of the EIR?

LITERATURE REVIEW

In this era of technological advancement, electronic information resources have taken a central place in library and information centers, to the extent that the success and strength of any library now depends on the level of functionality of e-resources. There are certain variables which determine the adoption and use of electronic information resources. These variables are called predictors, these include; availability, accessibility, awareness, motivation etc. Tella *et al,* (2007); revealed that self-efficacy and use of electronic information jointly predict and contribute significantly to academic performance of students. They concluded that respondents with high self-efficacy made the best use of electronic information, and this eventually made them perform better. Ahmad and Panda (2013) investigated the awareness, and use of the electronic information resources by faculty members of Indian Institutes in Dubai International Academy City (DIAC). The results revealed that majority of faculty members are aware of the EIR and also apply it to meet their information needs. The study confirmed that lack of knowledge affects the use of libraries specific resources such as e-theses, patents and CD-ROM database. It is also found that 100% faculty members agreed that e-resources are very useful and important to their work.

Furthermore, Ogunyade and Oyibo (2003) examined the use of Medline, the database of life sciences and biomedical bibliographic information, by medical students in University of Lagos. The study found that the use of databases was poor, due to lack of awareness. In the same vein, Okiki (2012) studied the awareness, attitude and use of the electronic information resources by members of academic staff of University of Lagos, Nigeria with a view to survey the exposure of academics to the electronic information resources. The study confirmed that fifty five percent of members of academic staff indicated that the level of awareness of the subscribed electronic information resources by the library management is rather low. The paper identified reasons why members of academic staff of University of Lagos use the electronic information resources which include research activity, Paper writing for publication, and teaching.

Another study carried out by Nwabueze and Urhiewhu (2015) on availability and the use of digital information resources by undergraduates of universities in Delta and Edo states, Nigeria. The major finding was that, some digital information resources were available in the university libraries. The findings also revealed that students make use of the DIRs to a low extent. The constraints encountered by students towards accessibility and use of the DIRs in the four libraries are epileptic power supply, non-availability of online databases, lack of formal training in Internet browsing skills among students, low bandwidth, network problems, and server slowness. Also, Akpojotor (2016) conducted a study on the awareness and usage of the electronic information resources amongst postgraduate students of Library and Information Science in Southern Nigeria. The results obtained revealed that postgraduate students of library and information science were quite aware and highly use electronic

information resources. The study also reported that postgraduate LIS students are skilled in the use of electronic information resources.

In a study carried out by Luambano and Nawe (2004), they found that users of academic libraries are increasingly utilizing the electronic information resources as more access points are made available. The findings indicated that at least 86.3% of users were using the electronic information resources and services to browse the World Wide Web and to access various online resources, though most of them depend heavily on search engines. In the same vein, Ehikhamenor (2003) posited that facilities that attracted the greatest amount of patronage were e-mails, catalogues and databases, e-journals, www resources, and software.

Herman (2006) investigated the use, perceived usefulness and satisfaction with electronic resources among the Kulliyyah of Islamic Revealed Knowledge (KIRK) and Kulliyyah school of Information and Communication Technology (KICT) postgraduate students. The overall results showed that OPAC was the most regularly used e-resources provided by the library. The respondents also perceived e-resources as useful and the level of satisfaction with e-resources was reasonably high. Similarly, Ibrahim (2004) examined the use and perception of the United Arab Emirates University (UAEU) faculty members on electronic resources. Analysis confirmed that the frequency of using electronic resources was low since their perception toward the usefulness of electronic resources vary small to a large extent. Reasons cited were lack of time because of the time needed to focus on teaching; lack of awareness of electronic resources provided by the library; ineffective communication channels, and language barrier.

Pan *et al,* (2008) examined the roles of two aspects of e-resources characteristics namely, information quality and system quality in predicting public health students' intention to use e-resources for completing research paper assignments. The study found that perceived usefulness played a major role in determining students' intention to use e-resources. Perceived usefulness and perceived ease of use fully facilitated the impact of information quality and system quality on behavior intention. It is evident that there is continuous research into different aspects of e-resources; this may be due to advancement in ICT. Therefore, this study will x-ray e-resources and reveal its strengths and weaknesses, at the same reveal areas that need to be improved upon. The predictors as revealed in the literature includes: availability, accessibility, awareness, satisfaction derived, ease of use, quality of information, self-efficacy, perceived usefulness, level of literacy, attitude etc. Literature review also showed that there are some factors that militate against effective use of electronic information resources; these include lack of awareness, poor internet service, poor searching skills, lack of knowledge about the resources, lack of publicity, insufficient time to use the services.

However, it was noted that none of the literature reviewed, to the best of researchers' Knowledge, have carried out study on the predictors of electronic information resources utilization by researchers focusing Agricultural Research Institutes in Kwara State. These are the part of the gaps that exist in the previous studies that this study intended to fill. It is in light of this, that this study was design to examine the predictors of electronic information resources utilization by researchers in Agricultural Research Institutes in Kwara State.

MATERIALS AND METHODS

This study adopted survey research design. The population of this study consists of all the researchers in Agricultural Research Institutes in Kwara State. A recent record (nominal roll) showed that the total number of the researchers in the three research institutes in Kwara State is 201, NSPRI (91), NCAM (62) and ARMTI (48). The sampling technique used in this study is total enumeration sampling technique. Therefore, the sample size of this study is 201. 172 questionnaires were shared out of which 140 were returned. This study adapted Unified Theory of Acceptance and Use of Technology (UTAUT). This is because the study evolved around ICT and this theory explained some factors that predict the use of information technology. These factors include; performance expectancy, effort expectancy, social influence, and facilitating conditions. This study focused on performance expectancy and effort expectance. This is because they determine the adoption, which will in turn determine the use of the system,

A self-design questionnaire was used to gather data for this study. The instrument was open and closed ended which adopted 4-point rating scale ranging from SA=1 – SD= 4 and Yes/No questions. The questionnaire underwent face validity by senior research officers in NSPRI. Also, the reliability test of the questionnaire was done in National Fresh Water Research Institute (NFRI), new Bussa considering 20 researchers using split-half reliability method, the coefficient of the reliability test was 0.75. The questionnaires were administered in person to all the respondents. The consent of the respondents was obtained with due respect to their personality, and with an assurance that the data obtained will be for research purpose only without any form of manipulation. The data collected were analyzed using descriptive statistics of frequency count and percentage and presented in tabular form. This method was adopted because it is suitable for analyzing numerical data and also due to their simplicity and easy to understand.

Statistical Analysis

Means were subjected to t-test statistics using SAS (2002) model.

RESULTS AND DISCUSSION

The result in Table 1 revealed the demographic information of the respondents. This showed that out of 140 respondents, 82 (58.6%) were male while 58 (41.4%) were female. On the age distribution of the respondents, the result confirmed that 23 (16.4%) fall between the ages of 20-29, 74 (52.9%) were between 30-39years, 35 (25.0%) fall between the ages of 40-49years, 6 (4.3%) fall between 50-59years while 2 (1.4%) were 60years and above. In summary, it can be noted that majority of the respondents fall between the ages of 30-39years. On the year of experience of the respondents, the result revealed that 62 (44.3%) had 1-5 years of experience. Next to this are the respondents that had 6-10 years of experience representing 44 (31.4%). This is followed by the respondent that had 11-15 years of experience which constitutes 21 (15.0%). The result also showed that 7 (5.0%) had more than 20 years of experience while 6 (4.3%) had 16-20 years of experience. In summary, it can be noted that majority of the respondents had 1-5 years of experience.

Table 1: Demographics of the Respondents

Gender	Frequency	Percentage
Male	82	58.6
Female	58	41.4
Total	140	100.0

Available electronic information resources in agricultural research institutes in Kwara State

Identified electronic information resources in agricultural research institutes in Kwara State are presented in Table 2. The results showed that e-journals 105 (75.0%); e-books 95 (67.9%); e-databases 73 (52.1%), and CD-ROMs 72 (51.4%) are more available than other resources. This means that e-journals, e-books, e-databases and CD-ROMs are the electronic information resources that are available in Agricultural Research Institutes in Kwara State. This confirmed availability of required e-resources, which also informed that these research institutes are imbibing technology in information management.

This showed that e-journals, e-books, e-databases and CD-ROMs are the electronic information resources that are available in agricultural research institutes. This finding is in agreement with work of Adeniji, Babalola and Ajayi (2015) who reported that internet facilities, e-journals, e-books, OPAC, CD-ROM are commonly available for use in the library and that librarians use electronic resources regularly for daily routine and research work, article search, Library of Congress (LC) online catalogue and OPAC largely for the purpose of in-house official duty

Table 2: Available Electronic Information Resources in Agricultural Research Institutes

S/N	Electronic Information Resources	A	NA
1	E-journals	105 (75.0%)	35 (25.0%)
2	E-books	95 (67.9%)	45 (32.1%)
3	E-databases	73 (52.1%)	67 (47.9%)
4	E-magazines	58 (41.4%)	82 (58.6%)
5	E-serials	40 (28.6%)	100 (71.4%)
6	Reference database	62 (44.3%)	78 (55.7%)
7	E-images	53 (37.9%)	87 (62.1%)
8	CD-ROMs	72 (51.4%)	68 (48.6%)
9	E-dissertations and Theses	43 (30.7%)	97 (69.3%)
10	E-audio visual resources	57 (40.7%)	83 (59.3%)

Predictors of electronic information resources utilization by researchers in agricultural research institutes in Kwara State

The predictors for the utilization of electronic information resources are presented in Table 3. Based on performance expectancy of the EIR, the result showed that majority of the respondents agreed that using EIR enables them to accomplish tasks more quickly, improve their research performance, enhance their effectiveness in their research, increase their research productivity, support critical aspects of their research work; and make it easier for them to do their job.

Table 3. Predictors of Electronic Information Resources of utilization by the Researchers

S/N	Performance Expectancy	SA	A	D	SD
1	Using EIR enables me to accomplish tasks more quickly	92 (65.7%)	45 (32.1%)	1 (0.7%)	2 (1.4%)
2	Using EIR improves my research performance	27 (19.3%)	63 (45.0%)	36 (25.7%)	14 (10.0%)
3	Using EIR enhances my effectiveness in my research	69 (49.3%)	60 (42.9%)	7 (5.0%)	4 (2.9%)
4	Using EIR increases my research productivity	72 (51.4%)	56 (40.0%)	7 (5.0%)	5 (3.5%)
5	EIR supports critical aspects of my research work	61 (43.6%)	66 (47.1%)	9 (6.4%)	4 (2.9%)
6	EIR makes it easier to do my job	68 (48.6%)	61 (43.6%)	6 (4.3%)	5 (3.6%)
7	EIR allows me to accomplish more work than would otherwise be possible	60 (42.9%)	68 (48.6%)	8 (5.7%)	4 (2.9%)
8	Overall, I find EIR useful in my research work	79 (56.4%)	53 (37.9%)	3 (2.1%)	5 (3.6%)

SA=strongly agree, A=agree, D=disagree, SD=strongly disagree

The effort expectance of electronic information resources is presented in Table 4. From the table, majority of the respondents agreed that learning how to use EIR is easy for them; using EIR improves their skills; EIR is easy to understand; EIR is very easy to use. In summary, it can be deduced that benefit derived from using EIR and ease of use of EIR are the predictors for the use of EIR.

Table 4. Effort Expectancy of the respondents

S/N	Effort Expectancy	SA	A	D	SD
1	Learning to use EIR is easy for me	69 (49.3%)	63 (45.0%)	5 (3.6%)	3 (2.1%)
2	Using an EIR improve my skills	75 (53.6%)	55 (39.3%)	8 (5.7%)	2 (1.4%)
3	I find that use of EIR is easy to understand	48 (34.3%)	72 (51.4%)	17 (12.1%)	3 (2.1%)
4	I find that an EIR is very easy to use	27 (19.3%)	49 (35.0%)	42 (30.0%)	22 (15.7%)
5	It is easy for me to remember how to use EIR whenever I want to conduct research	47 (33.6%)	72 (51.4%)	18 (12.9%)	3 (2.1%)
6	EIR is rigid and inflexible to interact with	27 (19.3%)	49 (35.0%)	42 (30.0%)	22 (15.7%)
7	Overall, I find the EIR easy to use	44 (31.4%)	84 (60.0%)	10 (7.1%)	2 (1.4%)

SA=strongly agree, A=agree, D=disagree, SD=strongly disagree

In the same vein, the study also found that benefit derived (performance expectancy) from using EIR and ease of use (effort expectancy) are the predictors for the use of EIR. This finding is in agreement with the work of Sharma (2009) who reported that easiness in use (effort expectancy) and usefulness of e-resources among others are the major factors that predict the adoption and use of e-resources.

The use of EIR by Researchers

Majority of respondents are using e-journal to a great extent (Table 5). Also, e-books and e-databases are used to some extent while majority of the respondents are not using e-magazines, e-serials, reference database, e-images, e-dissertations and theses, and e-audio visual resources. E-journals are greatly used due to the professional way of publishing relevant and current papers in e-journals. Also, e-books are produced occasionally and in most cases on a particular knowledge area, while journal contain articles in different knowledge areas and are produced periodically.

Table 5: The extent to which Researchers Using Electronic Information Resources

S/N	EIR	GE	SE	LE	NE
1	e-journals	47 (33.6%)	57 (40.7%)	22 (15.7%)	14 (10.0%)
2	e-books	31 (22.1%)	59 (42.1%)	22 (15.7%)	28 (20.0%)
3	e-databases	17 (12.1%)	54 (38.6%)	30 (21.4%)	39 (27.9%)
4	e-magazines	17 (12.1%)	40 (28.6%)	32 (22.9%)	51 (36.4%)
5	e-serials	9 (6.4%)	35 (25.0%)	29 (20.7%)	67 (47.9%)
6	Reference database	19 (13.6%)	49 (35.0%)	26 (18.6%)	46 (32.9%)
7	e-images	18 (12.9%)	39 (27.9%)	34 (24.3%)	49 (35.0%)
8	CD-ROMs	`18 (12.9%)	40 (28.6%)	43 (30.7%)	39 (27.9%)
9	e-dissertations and Theses	20 (14.3%)	40 (28.6%)	25 (17.9%)	55 (39.3%)
10	e-audio visual resources	14 (10.0%)	45 (32.1%)	28 (20.0%)	53 (37.9%)

(GE=Great Extent; SE=Small Extent; LE=Low Extent; NE=No Extent)

Furthermore, study found that e-journals, e-books, e-databases were mostly used by the researchers. This finding supported the work of Okiki (2012) who reported that online databases, web-based resources, Digital Library Collections (DLC), e-books, and e-journals are the major e-resources that academic staff member of University of Lagos, Nigeria always use for research work. This may be due to the fact that conducting research is one of the criteria for the promotion of academic staff, and they need different information resources for the success of their research works.

Factors militating against the effective utilization of electronic information resources by researchers

Factors militating against the effective utilization of electronic information resources are presented in Table 6. The results revealed that poor internet services; epileptic power supply, poor awareness of getting used to library software, inadequate local area network, and insufficient fund to subscribe are major factors militating against the effective utilization of electronic information resources

Table 5. Factors militating against the effective utilization of electronic information resources

Factors	Yes	No
Poor internet service.	113 (80.7%)	27 (19.3%)
Technology knowhow.	60 (42.9%)	80 (57.1%)
Epileptic power supply.	106 (75.7%)	34 (24.3%)
Poor awareness of getting used to library software.	72 (51.4%)	68 (48.6%)
Inadequate Local Area Network.	100 (71.4%)	40 (28.6%)
Insufficient fund to subscribe.	94 (67.1%)	46 (32.9%)
Lack of personal Laptop or hand-held devices.	48 (34.3%)	92 (65.7%)

The study found that poor internet services; epileptic power supply, poor awareness of getting used to library software, inadequate local area network, and insufficient fund to subscribe to internet and e-databases are the major factors militating against the effective utilization of electronic information resources. This finding is in line with the work of Nwabueze and Urhiewhu (2015) who reported that, epileptic power supply, none availability of online databases, lack of formal training in Internet browsing skills among students, low bandwidth, network problems and server slowness are the challenges that undergraduates of universities in Delta and Edo states encountered while using digital information resources.

CONCLUSION

Successful research can only be conducted in an environment where adequate and current information are available and accessible. In this era of ICT, the use of e-resources is gaining momentum. This has changed the way and manner information seekers go about meeting their information needs. This may be due to its enormous advantages over print publications. Libraries in agricultural research institutes have the responsibilities to support researchers to meet their information needs towards achieving their mandate. So therefore, e-resources have a positive role to play in this regard.

There are variables that predict adoption and use of e-resources. There is need to continually examine these variables so as to establish the relationship between them and utilization of e-resources.

Based on the findings of this study, the researcher therefore recommends as follows:

It was evident that e-journals, e-books, e-databases are available, accessible and utilized to some extent by researchers; therefore, timely subscription of internet and fee-based database should be upheld to ensure continuous access. Federal government should provide quality internet services by acquiring the required bandwidth and supply to Agricultural Research Institutes at a subsidized amount. This will also be minimized challenges of totally relying on individual Internet Service provider.

Also, there should be provision for alternative power supply by having a dedicated power generating plant and or solar power. This is particularly important because of the total dependence on public electric power supply which is not stable.

Federal government should establish e-agricultural library and network all Agricultural Institutes, universities, colleges of agricultures, and ministries of agriculture for knowledge and resources sharing in form of local online database. There should be a continuous awareness and training of targeted users on the use of e-resources most especially researchers believing that it enhances utilization of e-resources.

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