

An Assessment of the Use of Electronic Information Resources and Facilities by Engineering Scholars in Nigeria

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Abstract - The purpose of this paper is to assess the use of electronic information resources and facilities among Engineering Scholars in Private Universities in Nigeria using Bells University of Technology, Ota, Nigeria as a Case Study. Scientific investigation involves careful and proper adoption of research design, use of standardized tools and texts in identifying adequate sample techniques for data analysis. In this survey a questionnaire was adapted, tested and employed to collect primary data of academics from Mechanical, Mechatronics, Biomedical, Telecommunications, Electrical-electronics and Computer engineering Departments of Bells University of Technology, Ota Ogun State, Nigeria. In all, a total of forty-two faculty members, associate and research staff participated from the college of Engineering. The questionnaires were distributed among forty-two faculty members from the six departments of the college of engineering, out of which 40 were returned and found to be valid, making a response rate 95.23%. Among the 40 respondents, 2 faculties do not use electronic information resources. Thus, response rate is reduced to 38 (95.00%). In addition individual interview and observation methods were also used to collect the required information. The results correspond with previous studies conducted in other countries. The Engineers still stick to the printed information sources, but they pay good attention to electronic resources. Most of them have access to computer and internet at the office and home. They are regular users of a variety of electronic technologies. Although faced with some challenges. Thus, the applied scientists perceive that modern technology made their work easier. The study focused only on the engineering faculty in the first private university of technology in Nigeria. The survey could be replicated among other faculties such as humanities and or in other private universities in Nigeria and on a larger sample for generalization. Keeping in view the positive trend of engineering towards modern technology, universities and libraries should be adequately funded to provide electronic resources and facilities in the science and applied science discipline. Special training programmes for engineering scholars should also be organized. This is the first study on this topic in a private university of technology in Nigeria. The results can also be used to design services and facilities in academic libraries and information centers in private universities and universities of technology in Nigeria and in other developing countries.

Keywords: Electronic Resources, Information, Communication Technologies, Internet, Information Services, Academic Library, Nigeria

I. INTRODUCTION

Disciplines usually included in the Applied Sciences (AS) are Engineering, Technology, Medicine and Health

Sciences. Researches in AS generally are practical application of science and existing scientific knowledge to create solutions to real world problems and needs. For instance, access to technology or inventions are used with accumulated theories, knowledge, methods, and techniques to drive human purpose. Engineering as an aspect of applied science deals with solving practical problems. It is a profession that truly makes a difference, as engineers constantly discover how to improve lives. From small villages to large cities, engineers as Applied Scientist (AS) are involved in innovative improvements to all aspects of life; from health care to energy production, protecting and rehabilitation of the environment, to developing the newest technological device respectively. Engineering as applied science resides in the messy real world and Engineers whether professionals and or academic, utilise strict research protocols and empirical methodologies to proffer solutions to societal problems. The powerful forces of demographics, globalization and the rapidly evolving technologies of the 21st century has been reiterated to great extent to have caused profound changes in the role of engineering in the society. Similarly, the ever changing technological and innovative needs of global knowledge economy village that we live in today have greatly impacted on the nature of engineering practice and broader skills are generally required of engineering as scientific and technology-based disciplines.

However, literature attested to the nonlinear nature of AS. This nature of the AS determines the flow of knowledge between fundamental research and engineering application. General research studies have also revealed, that, systemic research approaches predominates the applied sciences. The reasons as attested by reviewed literature are as a result of the highly interdisciplinary nature of new technologies, impact of cyber infrastructure demand, all of which has necessitated new paradigms in engineering researches and development. According to Fezari & Al-Dahoud (2018), Engineering is not known for literary style, theories and compelling prose but, it is known as an applied science field that is application, experimental and measurement based in nature. Engineers are generally known to be comfortable with numbers and laboratory works; they prefer spending time working with mathematical equations and applying the equations to proffer solutions. The duo of Fezari and Al-Dahoud (2018) reiterated that Engineering is a discipline

with academic component and research is an essential element of its academic aspect. Driscoll (2011) listed materials necessary for research in the AS to include basically primary (simulations, mathematical models and variety of tests, design etc) and secondary materials (all editions of journals, books, professional materials, and writing guides) within the field of engineering respectively

The AS and engineers satisfy their information urges and satiate their thirst for knowledge with the use of library resources and personal collections. Accordingly, Towolawi & Omagbemi, (2018), opined that the library is the workshop of all workshops and the laboratory of all laboratories which have been fulfilling the traditional needs of its users for centuries (Engineers inclusive). However, the advances in Information and Communication Technologies (ICT) have made libraries to shift paradigm in the means, methods and modalities of gathering, storing, analysing, persevering and disseminating of information, its resources and services. Thus, ICT has made information to be ubiquitous and has collapsed the barriers of distance, time and space, thereby turning the world into a global village.

II. STATEMENT OF PROBLEM

The emergence of ICT has profoundly impacted teaching, learning and research and it has generally led to the development of electronic format of educational resources which are available online. The new trend however, is the digitization of all forms and format of information to create educational forms of electronic databases, e-books and journals and repositories (Towolawi & Fawole, 2018a). Academic and research based institutions are subsequently, utilising electronic databases, institutional repositories, ebooks and journals as means to provide free access to research output. Electronic resources are however, of different types and they formed the established components of many academic library collections (Towolawi & Fawole, 2018b).

Electronic resources are broadly defined as information accessed via electronic devices such as computers, i-phones and i-pads etc. They are use by researchers as guides to potential sources but, as of yet, they infrequently appear as cited references in their own right (Graham, 2000). As a result of the aforementioned, literature affirmed and Olajide and Adedokun (2018) corroborated, that, users do not necessarily need to be physically present in the library to use the library resources; instead the electronic form of the library resources are made accessible via the internet in individual offices, homes, schools, etc. Hitherto, the general advances in ICT have enabled academic libraries to provide electronic databases namely: Green file, NASA, AES, Engineering village, IEEE Xplora, Scopus, Web of Science, Bepress, DOAJ, E-agre, emerald insight, ASCE, SID, BioOne, ARDI and ACM digital among others for the Engineering Scholars. Similarly, institutional based OPAC, CD-ROMS, e-journals and e-books collections on various

subjects are accessible for Engineers (Prangya & Rabindra, 2013, Sharma, 2009 In Olajide and Adedokun, 2018).

It has also been generally observed too, that, faculty members in Nigerian universities, private inclusive are confronted with various challenges in the bid to utilise electronic resources and facilities. Accordingly, Obiroa, Okeke and Ejedafuru (2013), observed such challenges to be related to electronic resources management style, frequency of changes in technologies, financial constraints, availability of e- books and e-journals and constraints to the management of e- resources. Others as affirmed by literature are inadequate internet facility, high cost of subscription, poor user skills, and lack of awareness amongst others in the use of e-resources (Tahir, Mahmood and Shafiq, 2008). Are engineering faculties in Bells University aware of the existence of these electronic information resources and facilities? Are they using them and what is their point of access, problems and challenges? These are some of the questions this study set out to answer.

It is therefore, against the above premise and the need to contribute to knowledge that the current study was undertaken to add to the scarce and limited available literature on the use of electronic information resources and facilities by engineering scholars in Bells University of Technology, the first Private University of Technology in Nigeria

III. OBJECTIVES OF STUDY

1. To determine the level of awareness of engineering faculty members on the availability of electronic information resources and facilities.
2. To determine the frequency of use of electronic information resources and facilities by engineering faculty members
3. To examine the purpose of use of electronic information resources and facilities by engineering faculty members
4. To determine the preferred type among the available electronic information resources and facilities by the engineering faculty members.
5. To identify the preferred point of access in using any of the electronic information resources and facilities among engineering faculty members
6. To determine the level of satisfaction in the use of electronic information resources and facilities by engineering faculty members
7. To ascertain the problems encountered and barriers to the use of electronic information resources and facilities by engineering faculty members

A. Research Questions (RQ)

1. What is the level of awareness of engineering faculty members on the availability of electronic information resources and facilities?

2. What is the frequency of use of electronic information resources and facilities by engineering faculty members?
3. What is the purpose of use of electronic information resources and facilities by engineering faculty members?
4. What is the preferred type among the available electronic information resources and facilities by the engineering faculty members?
5. Which is the proffered point of access in using any of the electronic information resources and facilities among engineering faculty members?
6. What is the level of satisfaction of engineering faculty members in the use of electronic information resources and facilities?
7. What are the problems encountered and barriers to the use of electronic information resources and facilities by engineering faculty members?

IV. REVIEW OF LITERATURE

User studies generally are important area of library research, where the information-seeking behavior of multifarious user groups is used to improve, provide and evaluate library resources and services. Numerous evidences also abound in the literature. Adeleke and Nwalo (2017), in a study on the availability, use and constraints to use of electronic information resources by postgraduate's students at the University of Ibadan, appreciated the availability, awareness and use of electronic resources as a means to provide access to authoritative, reliable, accurate and timely information. The duo found out that, the internet was ranked as the most available and the most utilised by library users. Similarly, they also discovered that, low level of usage of full texts databases is linked to a number of constraints such as interrupted power supply, speed and capacity of computers, retrieval of records with high recall and low precision, inability to retrieve relevant information needed, lack of knowledge of search techniques, non possession of requisite skills and internet access challenges respectively among scholars.

Similarly, Olajide and Adedokun (2018) surveyed 86 faculty members of Afe Babalola University, Ado-Ekiti (ABUAD), to determine the awareness and use of electronic resources using structured questionnaires. The duo discovered that majority of faculty members are aware and use the different electronic resources and they utilise the electronic resources for research and teaching. Internet failure is a major issue facing the faculty, with persistent power failure and difficulty in identifying relevant databases.

However, Sejani (2017) after using the post-positivists paradigm and mixed methods technique, surveyed access to and use of electronic information resources in academic libraries of the Lesotho Library Consortium (LELICO) by using nine different institutions. The study, established that e-resources which were accessed and used mostly were e-

mail, search engines and websites, followed by the OPAC, e-journals, full-text databases, IRs, reference databases. The study further discovered that the main uses of e-resources were for communication, teaching and learning. The findings further revealed too, that, awareness of e-resources were created mainly through the library orientation programme and academics. Challenges and threats of access to and use of e-resources in these institutions include: budget cuts, low internet bandwidth, lack of up-to-date Information Technology (IT) infrastructure, inadequate searching skills, shortage of staff and high cost of subscription fees among others.

Islim and Sevim (2017) investigated what faculty members think about the use of technology in higher education and viewed its relation to technology and college students. The duo concluded that all faculty members defined themselves and their students to be technology compliant and competent. Thus, Engineers appreciate the advantages of electronic resources and databases, but they feel that experience, socioeconomic status and willingness to use technology are the main factors affecting technology competence.

A citation analysis of use of journals in history published between 1997 and 2000 showed that "although librarians and archivists continue to provide electronic access to scholarly online journals, primary sources, and rare secondary materials, these efforts do not play a significant role in the cited research of the history community. Only eight historians, in a pool of over 192, cited electronic resources" (Tahir, Mahmood and Sharfiq (2008); Graham, 2000).

In a survey of academic staff use of the library electronic information resources at the Olabisi Onabanjo University, Ago-Iwoye, Ogun State, Nigeria using 150 lecturers from four faculties, Olasore and Adekunmisi (2015), discovered that majority of lecturers made use of library electronic information resources majorly for research and lecture purposes. 92.70% (139) of the lecturers attested to using electronic resources, with 82.00% (123) it frequently (daily, twice weekly, and weekly). The duo also found out that 77(66.00%) confirmed that it usage is time-saving, 70(59.10%) considered them easy to use while 52(46.50%) and 52 (46.50%) considered them more informative and more useful respectively. Therefore, it is assumed that Engineers are most likely to use electronic information resources for their academic endeavors, teaching and research (Olasore and Adekunmisi, 2015)

V. METHODOLOGY

The study employed survey research design of the expository, as all variables had occurred and there was no manipulation. Using purposive sampling technique, 42 engineering faculties were selected from Mechanical, Mechatronics, Biomedical, Telecommunications, Electrical-electronics and Computer engineering Departments of Bells

University of Technology, Ota Ogun State, Nigeria and used for the study. An adapted questionnaire on the Use of Electronic Information Resources and Facilities by Engineering Academics (UEIRFEAQ), which was tested on 15 faculty members from the college of Management Sciences, was employed to collect primary data. In all, a total of forty-two faculty members, associate and research staff participated in the study from the college Engineering.

Hence, the questionnaires were distributed among forty-two faculty members from all the six departments of the college of engineering, Bells University of Technology, Ota. 40 were returned and found to be valid, thereby making a response rate 95.23%. Among the 40 respondents, 2 faculty members do not use electronic information resources. Thus, the response rate is reduced to 38 (90.47%). In addition individual interview and observation methods were also used to collect the required information. Data were analysed using frequencies and simple percentages. The distribution and questionnaire distributed and respondent's details are given in Fig. 1.

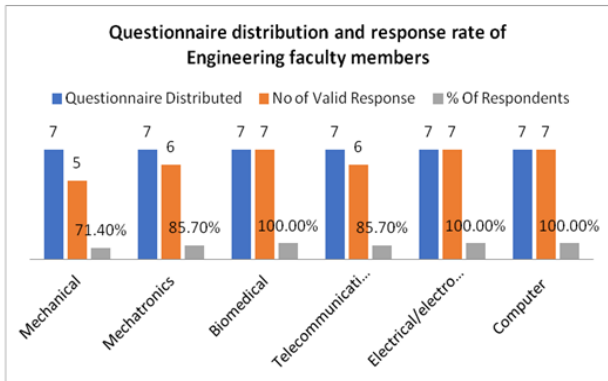


Fig. 1 Questionnaire distribution and response rate of engineering faculty members

Research Question 1: What is the level of awareness of engineering faculty members on the availability of electronic information resources and facilities?

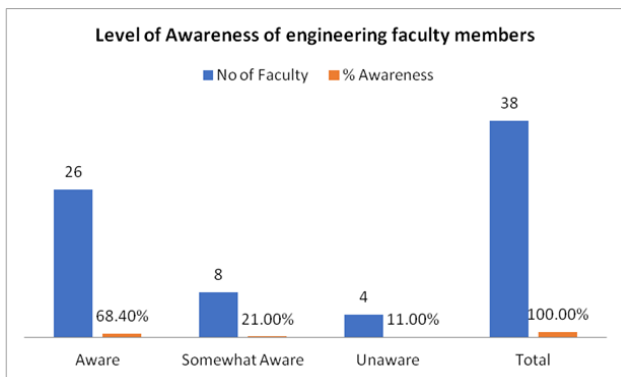


Fig. 2 Level of Awareness of engineering faculty members on the availability of electronic information resources and facilities

Fig. 2 shows that 26 (68.4%) of engineering faculty members are quite aware of the availability of electronic information resources and facilities in the library. Another 08 (21.0%) are "Somewhat aware", while only 4 (11.0%) are not aware. This shows that majority of the engineering faculty members are aware of the availability of electronic information resources and facilities

RQ 2: What is the frequency of use of electronic information resources and facilities by engineering faculty members?

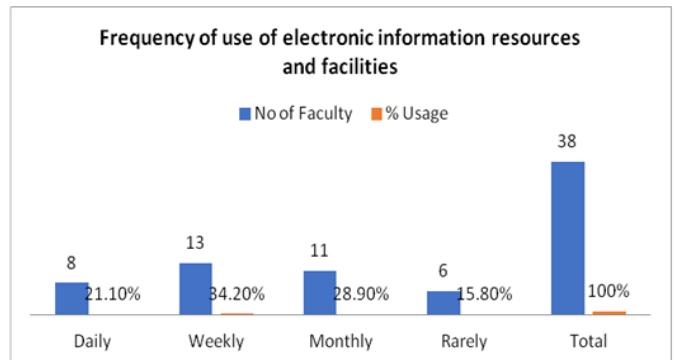


Fig. 3 Frequency of use of electronic information resources and facilities by engineering faculty members

Analysis from fig.3 reveal that, majority of the engineering faculties 8 (21.1%) use daily and 13 (34.2%) use the electronic information resources and facilities weekly, while 11 (28.9) utilise the electronic information resources and facilities monthly, Only 6 (15.8%) of the respondents using the e-resources rarely

RQ 3: What is the purpose of use of electronic information resources and facilities by engineering faculty members?

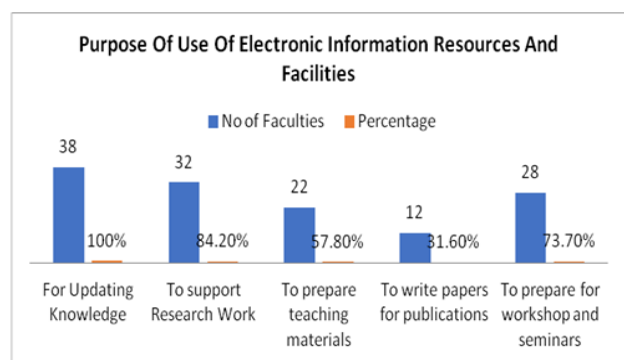


Fig. 4 Purpose of use of electronic information resources and facilities by engineering faculty members

Fig. 4 shows that engineering faculty members use electronic information resources and facilities for various purposes. From analysis, in order of purpose all the faculty members 38(100%) agreed to use electronic information resources and facilities to update their knowledge and 32 (84.2%) of them to support research work, 28 (73.7%)

faculty members use the electronic information for research works. While 22 (57.8%) responded that they were using the resources to prepare for teaching materials and only 12 (31.6%) responded that they were using the same for writing papers for publications.

RQ 4: What is the preferred type of electronic information resources and facilities needed by the engineering faculty members?

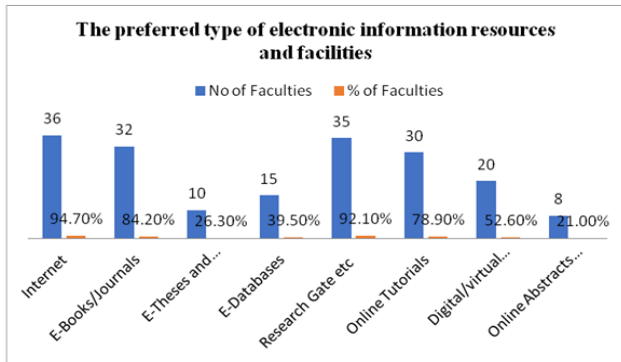


Fig. 5 The preferred type of electronic information resources and facilities needed by the engineering faculty members

From Fig.5 Engineering faculty members needed different types of electronic information resources and facilities to satisfy their needs. Fig.5 reveal that, 36 (94.7%) faculty members needed the Internet, 35 (92.1%) research gate and other educational sites, while, 32 (84.2%) needed e-books and journals, while, 30 (78.9%) and 20 (52.6%) needed online tutorials and digital/virtual library respectively. This is followed closely by only 15 (39.5%), 10 (26.3%) and 8 (21.0%) who responded they needed e-databases, e-theses/dissertations and online abstract /bibliography respectively.

RQ 5: Which is the preferred point of access in using any of the electronic information resources and facilities among engineering faculty members?

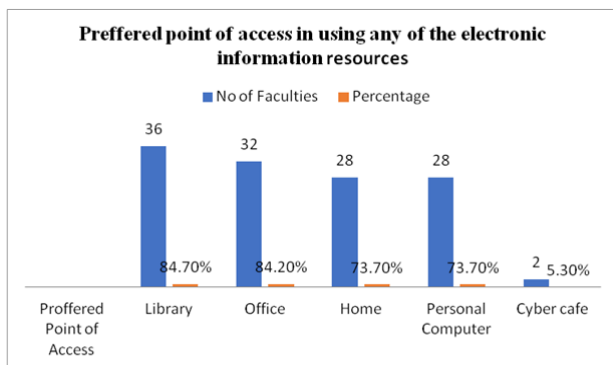


Fig. 6 Preferred point of access in using any of the electronic information resources and facilities among engineering faculty members

Fig.6 reveal the preferred point of access by Engineering faculties electronic information resources and facilities, as

majority of the engineering faculties 36 (84.7%) prefer the library as their point of access to use the electronic information resources and facilities, while 32 (84.2%) prefer their office utilizations point of access to electronic information resources and facilities. This is closely followed by preference for home and personal computer as indicated respectively by 28 (78.7%), Only 2 (5.2%) of the respondents prefer cybercafé.

RQ 6: What are the various electronic databases searched by engineering faculty members for getting literature in the various Engineering subject Areas

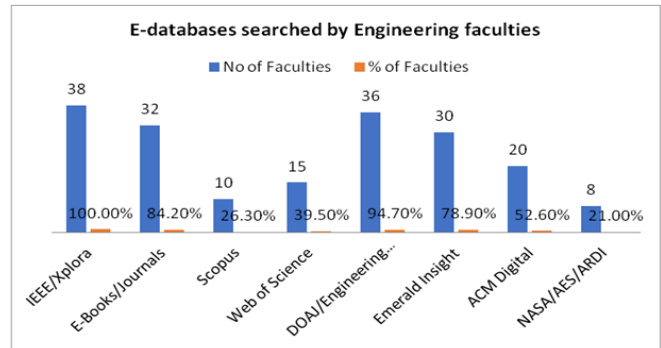


Fig. 7 The various electronic database sources searched by engineering faculty members for getting literature in the various Engineering subject Areas

From Fig.7, it is shown that engineering faculty members search different types of electronic information databases to get literature in the various subject areas of engineering to satisfy their teaching, research and learning needs. Figure 6 reveal that, majority 38 (100.0%) faculty members search IEEE/ xplora, 36 (94.7%) search DOAJ/Engineering village, 32 (84.2%) search e-books and journals, while, 30 (78.9%) and 20 (52.6%) and 15 (39.5%) search Emerald insight, ACM Digital and web of Science respectively. This is followed closely by search in Scopus with only 10 (26.3%) and NASA?AES/ ARDI as 8 (21.0%) responded searching these two e-databases as the least.

RQ 7: What are the Problems Encountered and Barriers to the Use of electronic information resources and facilities by engineering faculty members?

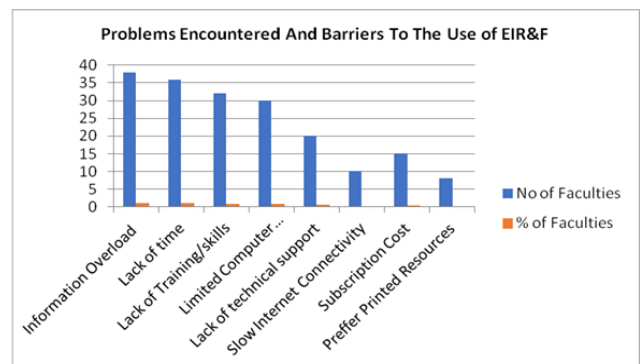


Fig. 8 Problems encountered and barriers to the use of electronic information resources and facilities by engineering faculty members

Fig. 8 reveals the challenges engineering faculties face in retrieving and using electronic information resources and facilities. As revealed, it shows that engineering faculty members face some problems in the cause of use of different types of electronic information resources and facilities. Fig.8 reveal that, majority 36 (94.7%) of faculty members encounter the problem of information overload, 34 (87.9%) responded it is time wasting as indicated that there is lack of time to search and use the EIR & F, 34 (84.2) do not have the prerequisite training and skills in the use of the EIR&F, while 30 (78.9%), 20 (52.5), 8(21.0%)) face the problems of inadequate computer hardware and software, lack of technical support, slow internet connectivity and subscription cost respectively. However, 10 (26.3%) of the respondent prefer the printed resources to the EIR & F.

VI. RESULTS AND DISCUSSION

1. Majority (86.4%) of the Engineering faculty members in Bells University, Ota are quite and somewhat aware of the existence and availability of electronic Information Resources and facilities at the University library.
2. More than the average (55.3%) of the Engineering faculty members in Bells University, Ota make use of electronic Information Resources and facilities daily and weekly.
3. Majority (100%) make use of electronic Information Resources and facilities to update knowledge, support their research work and for the preparation of teaching materials.
4. Majority (100%) of Engineering faculty members indicated that they prefer the use of the Internet, others (92.1%) make use of Research gate and other educational sites, Ebooks and Journals, online tutorials and digital/virtual libraries respectively.
5. Majority of faculty members prefer the use of the library and personal Office (84.7%) and home (73.7%).
6. The electronic sources used by the faculty members are IEEE/Xplora (100.0%), DOAJ/ Engineering Village (94.7%), Ebooks and Journals and emerald Insight and web of science.
7. The major problem confronting engineering faculties in the use of electronic information resources and facilities are information overload (94.7%), lack of training and skills (84.2%), inadequacy of computer hardware and software in the library (78.9%) and lack of technical support respectively.

VII. CONCLUSION

The findings of this study suggest that majority of the sampled population of Engineering faculties of Bells University of technology, Ota are quite aware of the availability of electronics information resources and facilities in the university library and also frequently utilise them for update knowledge, support their research work and to prepare teaching materials. They however, prefer the use of the internet access, Ebooks and Journals, research gate

and other educational electronic information resources to printed resources of the library.

Faculty members in the College Engineering Bells University of Technology however, prefer using the University library as point of access to the electronic information resources and facilities, but information overload, lack of training and skills to retrieve needed information, slow internet connectivity, inadequate computer software and hardware and lack of technical support are the identified problems that prevent the engineering faculties from using the resources and facilities. Thus, they resolved to use their office and home as alternatives point of access. The implication of the findings of this study is that other faculties may be facing similar challenges and there will be an underutilisation of these information resources and facilities. This could negatively impact the research output, teaching and academic performance of faculties on the long term basis. Therefore, there is need to organise training for faculties in the use of these resources, improve on the quantity and quality of computer hardware and software and provision of technical support. Once this is done, it will improve patronage of the electronic information resources at the university library and in turn justify the advantages inherent in the resources and the investment on provision. The following recommendations are suggested.

VIII. RECOMMENDATIONS

1. The paper recommends improvement in the provision of computer hardware and software and technical support services in electronic section of the University library. This will help improve faculty members' library patronage statistics.
2. Periodic trainings and seminars on the use of EIR & F is recommended for all faculties, with the design and production of search guides for lecturers to easy information retrieval.
3. Subscription to databases in the Engineering based subject field and selective dissemination of recent and updated electronic resources in Engineering as an applied Science profession is a sine qua non.
4. Allocation of adequate and sufficient funding to the University libraries to acquire the latest electronic information resources and facilities and computer hardware and software respectively is suggested.
5. Engineers work on their own; however, librarians should give search-assistance to get needed information despite the information overload on the internet.

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