Vol. 13(1), pp. 1-7, May 2025
https://doi.org/10.14662/ijarer2025055

ISSN: 2360-7866

International Journal of Academic Research in Education and Review

Full Length Research

Extent of Use of Digital Resources among Physics and Chemistry Final Year Undergraduate Students in Adeyemi Federal University of Education, Ondo, Nigeria

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Accepted 25 May 2025

The study was designed to determine the extent of utilization of digital resources by physics and chemistry final year students in Adeyemi Federal University of Education Library. It ascertained the utilization, challenges encountered in the utilization and proffer recommendations as strategies. Descriptive survey research design was used to guide the study. Out of 100 copies of questionnaire distributed, 80 copies were returned representing 80% .Simple Random sampling technique was used due to the enormity of the student population. The face validation of the questionnaire was determined by experts in research. The copies of questionnaire was administered through face to face method which involve the researcher and research assistants moving from one department of the library to another. In analyzing the data collected, mean ($\bar{x}$) was used as the statistical method. The different purposes and extent of utilization were analyzed. The study revealed the challenges encountered in the utilization; strategies to enhance effective utilization were proffered as recommendations such as need for the provision of more facilities, accessibility to the facilities, provision of reliable internet services, and centralization of proposed library building on the campus, training and retraining of library staff on ICT utilization to help students search for information.

Key Words: Digital Resources, Physics and Chemistry, Final Year Undergraduate Students, Adeyemi Federal University of Education, Ondo, Nigeria

Cite This Article As: Olubiyo, P.O., Olubiyo, J.T (2025). Extent of Use of Digital Resources among Physics and Chemistry Final Year Undergraduate Students in Adeyemi Federal University of Education, Ondo, Nigeria. Inter. J. Acad. Res. Educ. Rev. 13(1): 1-7

INTRODUCTION

Digital resources are indispensable in the 21st century academic work. A lot of information are online for the use of students, researchers and faculty. National Association for Scientists, (2000) proposed five common trends in the use of information technology and digital resources in data collection and analysis. They are: Increased use of computer for research. Many use computer for their research because of the speed and the corresponding decline in costs. Dramatic increase in the amount of information stored and analyzed. The creation of new families of instruments in which computer control and data processing are at core of observation. For example, in telescopes, image-matching programs on specialized computers align small mirror to produce the equivalent light gathering power of much larger scope with a

single mirror. Increased communication among researchers, resulting from proliferation of computer networks dedicated to research, from a handful in the early 1970s to over 100 nationwide at present. Increased availability of software packages for standard research activities. Robust software packages allow researchers to do statistical analyses of their data, compute complex mathematical functions, simplify mathematical expressions, maintain large data bases, and design everything from circuit to factories.

In recent years, Information and Communication Technologies have developed very rapidly in line with the growth and convergence that occurred in telecommunication technology. The convergence of computers and telecommunication technology has popularized the electronic generation and access to information. The tools include internet, personal computers, scanners, printers, CD-ROMs, flash drives, floppy diskettes, photocopies, fax machines, audio/video tape players, digital projector/screen digital camera and T.V (Anyaogu, 2007).

Achebe (2005) categorized ICT into five broad groups as follows: Capturing technologies (e.g. keyboard, touch screens, voice recognition system, image scanner etc). These technologies help researchers to send in their data to the system for processing, while storage technologies (e.g. floppy disks, smart card, magnetic tapes, disc e.t.c.) enable them to get from the system what data have been stored into the storage devices for use at a convenient time. Processing technologies comprise the system and application software while communication technologies are meant to display the captured object or information (e.g. Digital video, disc, CD ROM drives, audio CD, printers, computer display screen).

Students in science and technology need more of online resources than those in the Arts due to the need of the currency of their research. The older an information, the better it is for researchers in the Arts but for those in sciences the more current the information the more useful it is, due to the latest events and discoveries in the field which call for continuous research. Kumar and Kaur (2005) in Nwokedi and Amkpa (2011) affirmed that internet provides scientists, lecturers and students access to un-traditional sources of information at any points of the globe.

Physical science students cannot work without access to collaborators, to instruments, to information sources and sometimes to distant computers. Computers and communication networks are increasingly necessary for that access. Thus, three technologies are concerned with communications and collaboration: word processing, electronic mail, and networks. Word processing and electronic mail are arguably the most pervasive of all the routine uses of computers in research communication, electronic mail- sending text from one computer to another over the networks- is replacing written and telephone communication among many communities of scientists and is changing the way in which this communities are defined. Large collaborative project such as oceanographic voyages, use electronic mail to organize and schedule experiments, coordinate equipment arrival and handle other logistical details (National Academy of Science, 2000)

Statement of the Problem

With the information resources explosion in this digital age, students being information users should be more concerned on how to capture, process, preserve and use information. As such, Digital Resources have helped in the generation and management of information; and for it to be or could be use with relative ease, researchers need the knowledge of the extent of use of the facilities.

In the 21st century, digital resources have helped in academic work in the area of searching for information, cross fertilization of idea and experiment, data gathering, analysis and use; the importance of these resources in research work is becoming more prominent. Students' researchers in physics and chemistry sciences need to engage in research to make discovery of new properties in sciences; this stresses the reason why they need IT resources more in carrying out their researches in their final year.

Despite the importance of digital resources in the information age, students use of the library, the researcher observes that most of them do not normally use ICT resources especially in the library. Hence, the study considers it appropriate to find out the extent of ICT utilization among final year students in Adeyemi College of Education, Ondo.

Purpose of the Study:

(1) To examine the extent of utilization of Digital resources among physics and Chemistry sciences students in the College Library.

(2) To find out the challenges facing the utilization of ICT resources by the physics and Chemistry sciences students in the College Library.

Research Questions:

1) What is the extent of utilization of Digital resources among physics and Chemistry sciences students in the Adeyemi Federal University of Education Library?
2) What are the challenges facing physics and Chemistry sciences students in the Adeyemi Federal University of Education Library?

Review of Related Literature

The use of ICT facilities varies according to the level of the availability of the equipment, literacy skill and competences, awareness and accessibility. Different libraries have various kinds of policies as regard the use of their ICT resources. But generally most university libraries operate according to the same pattern. Some libraries charge users on the use of internet others make it free. In the area of accessing OPAC it is generally free in all academics libraries because it serves as the access to the library stocks or holdings. Users ICT skills also determine to a considerable extent the rate at which the ICT resources are being explored and librarian's contribution is another factor to be considered. The use of these facilities such as computers, CD-ROM, internet, slides, digital multimedia, video / VCD machine etc involve various methods which include systematized feedback system, computer based operation / network, video conferencing and audio conferencing internet / worldwide websites and computers assisted instruction. However, students, staff and the librarians will not perform well if there is no official training. The library professionals, as intermediaries, have to be experienced, to cope with the knowledge explosion which is a result of information technology (IT) and high expectation of users. (Edem, 2007).

According to EDUCAUSE (2011), the various degree of the ICT utilization among researchers in the body could be viewed from collaborator's or solo's perspective. E mail is rated as the highest with 90.5%. Others are teleconferencing (34.6 %), web based file storage (45.2 %), file sharing software (13.1%), Bridget-tracking software (9.8 %), and Desktop synchronization software (9.0 %) In a further statement, Valentine (1993) in Ozoemelem (2009) stated the study of students of tertiary institutions and showed that they look for the fastest way that would lead to satisfactory results when doing research by going for electronic information sources first. However, the use of ICT facilities in Kenneth Dike Library is low, irregular and ineffective as majority of users lack adequate ICT awareness, training and support to use the facilities. ICTs are tools that need to be exploited completely for modern research activities.

In a related study carried out at the University of Edinburgh, Haywood et al.(2010) reported that 50% of their current students using website report doing so 2-3 times per week on average in the current academic year, with a further 16% reporting daily use. It is clear that there is substantial rising use beyond the scheduled university teaching day. Similarly, in the SEUSSIS survey of established students at Edinburgh in 2001, it was found that 60% of students reported daily use of ICT in any form, with fewer than 5% reporting less than weekly use. Furthermore, they observed that new students arriving at the university are already used to studying with ICT. As 80% said that they used it 2-3 times per week or more and only 8% said they used it less than weekly. Clearly some of these uses are made inside the school but the school equipment demands much use outside school as 74% indicated that they also studied at home with PC. In contrast, in 1991/92, 60-70% of students reported "seldom or never" using PC for their studies at school or at home.

Established students appeared mostly to use ICT in their studies as a blend of 'free choice' and 'expected' or 'compelled' with a slight bias towards use required by teachers or course requirements. Respectively, 70% and 85% gave evidence of using ICT for researching information and preparing assignments as the dominant activities. The rate of ICT use among students differs in respect to the environment in which they are studying. In the developed world students make use of ICT facilities than the developing world because the resources are more readily available there. It is convenient for them.

METHODS

Population of the Study

The population comprises all the final year Physics and Chemistry undergraduate students in Adeyemi Federal University of Education, Ondo.

Sampling Technique and Sample Size

Simple Random sampling technique was used for the study. Therefore the sample size of the study was one hundred (100) degree students.

Procedure for Data Collection

The researchers and research assistants collected the data through face-to-face administration of questionnaire. This involves going to the various sections of the college library to administer the questionnaire and collecting them back at the same time because library is a venue where virtually all students are present to study.

Research Design

The research design for the study is descriptive survey research design. It is a design that allows a population to be studied by collecting and analyzing data from only a sample considered to be representing the entire population. This is suitable for this research because none of the variables was manipulated but explained the way they occurred in the field of study (Physics and Chemistry).

Research Instrument

The research instrument used for the study was adapted by the researcher. Section A comprises information on Biodata; Section B was on Likert type scaling which asked questions on Extent of Use of Digital Resources among Physics and Chemistry Final Year Undergraduate Students in Adeyemi Federal University of Education, Ondo, Nigeria

Procedure for Data Analysis

The responses of the respondents were collected, aggregated, and presented in a tabular form. Based on this, frequencies of occurrence were established and used for the analysis using percentages and mean.

Out of the one hundred copies of questionnaire that were distributed to respondents, eighty one copies representing 81% were filled and returned. The copies of the questionnaire were administered to final year students in sciences. They were organized, computed and analyzed using mean (x). The mean scores of the responses were presented in the tables below:

Demographic Data

Table 1: Sex distribution of the respondents

SEX DISTRIBUTION OF RESPONDENTS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	54	66.7	67.5	67.5
	Female	26	32.1	32.5	100.0
	Total	80	98.8	100.0	
Missing	NR	1	1.2		
Total		81	100.0		

From table 1 above, 54 out of 81 respondents are males while 26 are females.

Table 2: Distribution of the respondents according to programme of study

PROGRAMME OF STUDY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	DEGREE	81	100.0	100.0	100.0
	Total	81	100.0	100.0	

The table above reveals that all the respondents are degree students.

Table 3: Distribution of the respondents according to programme of study
AREA OF STUDY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Physics	51	63.0	63.0	63.0
	Chemistry	30	37.0	37.0	100.0
	Total	81	100.0	100.0	

From the table above, 51 of the respondents are physics students while 30 are chemistry students.

Table 4:TO WHAT EXTENT DO YOU USE DIGITAL RESOURCES IN THE UNIVERSITY LIBRARY?

SN	ITEMS	N	VHE	HE	LE	NA	MEAN
1	COMPUTER	74	30	18	20	6	2.97
2	INTERNET	74	26	30	17	1	3.09
3	COMPUTERS CONNECTED TO INTERNET	74	21	22	23	8	2.76
4	PRINTERS	74	21	18	23	12	2.65
5	SCANNERS	74	11	22	24	17	2.36
6	MICROFORM READER	73	10	10	23	30	2.00
7	PHOTOCOPIERS	73	22	23	22	6	2.84
8	FASCIMILE (FAX)	72	6	18	21	27	2.04
9	FLOPPY DISKETTES	71	10	12	23	26	2.08
10	CD-ROMs	74	11	18	24	21	2.26
11	FLASH DRIVES	74	18	24	20	12	2.65
12	VIDEO TAPE PLAYER	72	13	17	24	18	2.35
13	MULTIMEDIA/DIGITAL PROJECTORS	73	12	22	19	20	2.36
14	PROJECTOR SCREEN	74	13	19	24	18	2.36
15	FUNCTIONAL LIBRARY E-MAIL	74	20	28	16	10	2.78
16	INTERCOM	74	16	17	18	23	2.35
17	INSTITUTION (UNIVERSITY) WEBSITE	71	34	20	15	2	3.21
18	DIGITAL CAMERA	73	23	13	11	26	2.45
19	TELEVISION	74	15	22	16	21	2.42
20	TELEPHONE	74	18	17	16	23	2.41

Table 4 above shows the extent to which respondents use ICT facilities in the college library. Items 5, 6, 8, 9, 10, 12, 13, 14, 16, 18, 19 and 20 have respectively the following means 2.36, 2.00, 2.04, 2.08, 2.26, 2.35, 2.36, 2.36, 2.35, 2.45, 2.42 and 2.41 which all are less than the 2.5 criterion mean. Thus, the items are being rejected and therefore conclude that the respondents do not extensively use the items as stated in the table in the college library. However, the means of the remaining items are greater than the criterion mean. This implies that the respondents utilize the other items to a reasonable extent. Based on the analysis done on the extent of utilization of ICT facilities, it was discovered from table 7 that the ICT facilities have been used at various extents. Scanner, microform reader, facsimile (fax), floppy diskettes, CD ROMs, video tape player, multimedia/digital projector, projector screen, intercom, digital camera, television and telephone are not extensively utilized. However, out of all the facilities the institutional website (college), computer, computer connected to internet, internet and photocopiers were the ones used at a very high extent because their mean exceeded the criterion mean as shown in the analysis.

In line with the finding EDUCAUSE (2011) analyzed the various degree of ICT utilization. Computer, web-based file, and internet were rated very high among researchers. Equally, Edem (2007) affirmed that computer based operations/network, internet, computers were used to a considerable extent but depending on availability of the equipment, literacy awareness and accessibility.

From the research carried out by Haywood et al. (2010), 70% and 85% of the established students of university of Edinburgh gave clear evidence of using ICT for researching information and preparing assignment. Thus, the researcher can conclude that some ICT facilities such as computer, internet, website and we-based file are at high rate of uses among students for research purpose.

Table 5: What are the challenges to effective utilization of digital resources in the university library?

SN	ITEMS	N	SA	A	D	SD	MEAN
1	POOR AND UNCONDUCIVE ENVIRONMENT	74	29	23	16	6	3.01
2	UNFRIENDLY ATTITUDE OF THE LIBRARY STAFF	74	23	28	19	4	2.95
3	INSUFFICIENT ICT FACILITIES	73	32	31	6	4	3.25
4	INADEQUATE INFRASTRUCTURES	74	32	24	15	4	3.15
5	SLOW INTERNET CONNECTION	74	36	26	9	3	3.28
6	DIFFICULTY IN LOCATING WEBSITES	73	20	33	17	3	2.96

The means from the table above ranges from 2.87 to 3.25 which shows that all items are accepted as the challenges facing the effective utilization of ICT facilities in the college library since the lowest mean is 2.87 which is greater than the criterion mean. It therefore implies that all the items in table 8 are responsible for the ineffective utilization of ICT facilities in the college library.

CONCLUSION

Generally, the utilization of Digital Resources has a lot of invaluable advantages to library users. Siddigui, (1997), Henderson, (1992) cited in Anyakoha (2005) itemizing the following benefits of ICT to library users: speedy and easy access; remote access; round the clock access; access to unlimited information; and facilitating the reformatting and combination of data from various sources. However, there are challenges in the use of the resources in AFUED Library such as Insufficient ICT Facilities Inadequate Infrastructures Slow Internet Connection and others.

The implication of the study is based on the findings and discussions. Specifically, the following were deduced to be of immense benefit to the users, library staff, researchers in Adeyemi Federal University of Education, and general public.

This revealed that different types of ICT facilities are available and functional for use by students in physical sciences in the library. The available facilities include institutional website, computer internet, computer connected to internet, photocopiers, projector screen, printer, multi-media digital projector, functional e-mail, telephone, floppy disk, and flash drive, and CD ROMs. Although, some are available but are not functional. They are intercom, digital camera, video tape player and scanners, what this implies is that users are exposed to various kinds of ICT resources and what the library staff should do is to make sure that all are functional and accessible to users at all time.

The findings of the purpose of ICT utilization among physics and Chemistry science students in Adeyemi Federal University of Education show that there are different extent of purposes of ICT utilization in these libraries. The purposes correspond to the facilities available. Physical science students use ICT facilities in writing project and research work, browsing websites for scientific publication, write assignment, paper, exams, seminar presentation, uploading of document into text, storing and copying data not flash drives, diskettes and CD ROM, checking e-mail through internet, accessing other universities library database on CDs or DVD, browsing to read dailies, using power point package, projector screen, video or audiotape player from library to present in public presentation.

This implies that ICT facilities are relevant to the academic work of final year students in physical science. Therefore, the governing body of the libraries should make available good ICT facilities for users and the library staff should make them accessible to them. Hence, the goal of providing them can be achieved.

The finding on the extent of ICT utilization among physics and chemistry science students reveals the various extents at which the facilities are being utilized and this can help to improve on the provision of the facilities. That is, more of those that are being used at very high extent and high extent could be provided to complement the available ones. This will enhances the use of the resources more by students. Thus, computer, internet, photocopier, printer and website which are highly being used should be provided more and made efficient. If this is not done on time it will lead to quick ware and tear (frequent development of fault) of the regularly used ones.

Thus, the findings that insufficient ICT facilities, poor and unconducive environment, inadequate infrastructure time constraint distance of library to lecture hall / hostels, restricted access to the facilities were the problems students encountered have implications. The staff of college management team should find ways of eliminating the problems. If allowed to persists, the whole system will be faulty with dearth of current, relevant information resource necessary for the academic work of students.

RECOMMENDATIONS

Based on the results obtained from the study, the following recommendations were made:

1. The study recommends that there are needs to make all the available ICT facilities in the library accessible to all students in the college.
2. There is need for the provision of more space to enhance users' convenience
3. The study is recommending the provision of reliable internet facilities in all the university libraries to enable users excel in their academic activities.
4. There is need for proposed library building to be well located in campus to assist students in getting information resources easily.
5. There is urgent need for all library staff irrespective of qualifications and experience to be ICT compliant and up to date with recent technologies. This is because the utilization ICT facilities depend heavily on the skills and knowledge of the staff acquired. This study recommends a compulsory ICT proficiency courses, seminar, lecture, workshops on ICTs for library staff and physical science students.
6. More computer system should be installed and connected to internets for students use.

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