INVESTIGATE THE AWARENESS, ACCESS, LITERACY, AND COMPETENCY OF ICT FOR RESEARCH PURPOSES AMONG HND STUDENTS OF SCHOOL OF INFORMATION TECHNOLOGY, FEDERAL POLYTECHNIC NASARAWA, NASARAWA STATE, NIGERIA

Oyedepo, Femi Samson [1], Ramalan Baba Usman[2] & Mohammed Aji[3],
[1] Department of Computer Science, Kwara State Polytechnic, IIorin, Nigeria
[2] Department of Computer Science, Federal Polytechnic Nasarawa, Nasarawa State, Nigeria
[3]Rectory Department, ICT Unit, Federal Polytechnic, Bali, Taraba State, Nigeria
Corresponding author: bautipatrick@gmail.com

Abstract

The study investigates the awareness. Access, Literacy, and Competency of ICT for Research purposes among HND students of the School of Information Technology, Federal Polytechnic Nasarawa, Nasarawa state. A survey research design was used for the study. A structured questionnaire titled; ‒Level of ICT Awareness, Access, Literacy, and Competency ((LICT-AALC)) among the students‖ was used as an instrument for data collection. The internal consistency of the instrument was determined using Cronbach Alpha and a reliability coefficient of 0.537 for awareness, 0.660 for accessibility, 0.882 for literacy, and 0.888 for competency. The overall reliability estimate of 0.934 was obtained. Data was analyzed using mean and standard deviation. The results showed that most students are partially aware of ICT facilities for the conduct of research work in the School of Information Technology, Federal Polytechnic Nasarawa, Nasarawa state, although there was variation in the awareness in the four departments. Furthermore, the study found that most students have partial access to the ICT facilities for the conduct of research work in the School of Information Technology, Federal Polytechnic Nasarawa. It was recommended that the Polytechnic Management should create more awareness of the available ICT facilities in the institution to its HND students for research purposes. This would in one way increase the number of HND students who use the ICT facilities for research daily.

Keywords: Awareness, access, literacy, competency, research

Introduction

In the past, research in tertiary institutions was dominated by the use of printed materials as primary sources of information. But today, advanced, information and communication technology (ICT) have changed how information is accessed and disseminated (Ndinoshiho, 2010). The printed materials for research are gradually being replaced by electronic materials and libraries are gradually changing to virtual libraries with e-books and e-journals in addition to hard copies. Libraries are increasingly taking advantage of Information and Communication Technologies (ICTs) to provide access to users. The availability of information in electronic media has created opportunities for access to information. It helps the students to get the needed information without much stress, allows many users to access the same material at the same time, and also helps the postgraduate students to find current information related to their research areas (Varghese, 2008). The use of Information and Communication Technology (ICT) for research purposes has significantly transformed what research is all about (Anandarajan & Anandarajan, 2010). Furthermore, the use of ICT in carrying out research has dramatically reduced the barriers and obstacles attributed to distance (Anandarajan & Anandarajan, 2010). It can be said that the

acceptance of ICT in research is due to the provision of current and up-to-date information to researchers (Anandarajan & Anandarajan, 2010). Research is the most important component of HND studies (Ismail, Abiddin & Hassan, 2011). HND students are the major users of Polytechnic library resources and services. This might be so because of their need to write seminar papers, and term papers, and search for literature information for their assignments and other research activities. Although ICT plays an important role in the field of research, some variables are critical for the proper utilization of ICT facilities to conduct research. These variables include awareness of the existing ICT facilities, access to the ICT facilities, ICT literacy of the facilities, and competency of the researcher to use the ICT facilities. Awareness is knowing about the existence and importance of ICT facilities. Many studies have found ICT awareness of both undergraduates and HND students to be critical in the proper utilization of ICT facilities (Ponnudurai & Saravanan, 2017; Chimah & Udo, 2015; Deshpande, Joshi, Poonacha, Dave, Naik, & Mehta, 2016). Awareness of ICT facilities in libraries by users is an issue of much concern, though availability may not be a guarantee to complete usage. Therefore, the optimum utilization of ICT facilities by users depends on their awareness of the ICT facilities (Chigozirim, Ehioghae & Adesegun, 2014). Awareness of ICT facilities is when students have acquired information and knowledge about the existence of ICT facilities in the library (Verma & Dahiya, 2016). ICT accessibility means the degree to which computers and other computer-related gadgets are used by as many people as possible to retrieve and satisfy their information needs. With the use of ICT facilities students can find a huge amount of information to satisfy their information needs. Therefore, the Polytechnic Library should endeavor to make ICT facilities available and accessible to students. Research has shown that ICT literacy is an important skill to possess to access, retrieve, and use digitized information a research. The ability to use ICT facilities to search for information largely depends on your ICT literacy (Abubakar & Adetimirin, 2016). Also, the ability to locate, identify, and retrieve, is therefore necessary for students to acquire ICT literacy which can enable them to access and make effective use of electronic information from various sources for educational purposes (Abubakar & Adetimirin, 2016). Therefore, ICT literacy is critical for the proper utilization of e-resources (Fati & Adetimirin, 2017). ICT competency is considered a very important skill to possess to carry their research work, the ability to use ICT facilities in research depends on your competency. ICT competency refers to the use of word processing, presentation, and spreadsheets, and the ability to manipulate, store, communicate, and/or disseminate information. Many studies have investigated the ICT competency of both undergraduate and postgraduate students these include (Ahmad, Karim, Din & Albakri, 2013; Nwobu, Oyewole & Apotiade, 2016; Bichi, Embong. Rashid, 2017; Sadiku & Kpakiko, 2017; Joseph, John, Kurian & Tom, 2018; Ebijuwa & Mabawonku, 2019), all these studies pointed to the fact that ICT competency is necessary to create, editing, and format their research work. Therefore, ICT competency is essential to use ICT facilities to carry out research. Although many studies have been conducted on students‘ awareness, access, literacy, and competency in using information and communication technology, few of these studies were conducted with HND students in Federal Polytechnics in Nigeria. In particular, not many studies were conducted on the role of this variable in research. It is given that, this study investigated the awareness, accessibility, literacy, and competency level of ICT for research among HND students of the School of Information Technology, Federal Polytechnic Nasarawa. It should be noted that Federal Polytechnic Nasarawa, Nasarawa state, has a School of Information Technology and is a place where the ICT facilities should be utilized because of the Technology, especially for

research purposes. Hence, the a need for this study.

Objectives of the Study

Specifically, the objectives of this study were to:

1. To determine the level of awareness of ICT facilities among HND students of the School of Information Technology, Federal Polytechnic Nasarawa for research purposes.
2. The extent of HND students‘ access to ICT facilities for research purposes in the School of Information Technology, Federal Polytechnic Nasarawa.
3. The ICT literacy level of the HND students for research purposes in the School of Information Technology, Federal Polytechnic, Nasarawa.
4. The ICT competency level of the HND students for research purposes in the School of Information Technology, Federal Polytechnic, Nasarawa.

Research Questions

The following research questions were raised to guide the study.

1. What is the level of HND students‘ awareness of the ICT facilities for research purposes in the School of Information Technology, Federal Polytechnic Nasarawa?
2. What is the extent of HND students‘ accessibility to ICT facilities for research purposes in the School of Information Technology, Federal Polytechnic Nasarawa?
3. What is the ICT literacy level of the HND students‘ of School of Information Technology, Federal Polytechnic Nasarawa?
4. What is the ICT competency level of the HND students‘ of School of Information Technology, Federal Polytechnic Nasarawa?

Theoretical Framework

This study was based on the Diffusion of Innovation Theory (DoI) and the Unified Theory of Acceptance and Use of Information Technology (UTAUT). The Diffusion of innovations is a theory propounded by Everett Rogers that seeks to explain how, why, and at what rate new ideas and technology spread. While the Unified Theory of Acceptance and Use of Information Technology (UTAUT) was propounded by Venkatesh, Morris, Davis & Davis, 2019. This theory explains an individual‘s perception of acceptance and use of technology. UTAUT suggests four main determinants; performance expectancy (PE), Effort expectancy (EE), social influence (SI), and facilitating conditions (FC).

Method

A survey research design was used for the study this is because the researcher intended to describe the HND students‘ attitudes, opinions, behaviours, or characteristics toward the use of ICT facilities for research purposes. According to Creswell (2012), Survey research design are procedure in quantitative research in which investigators administer a survey to a sample or to the entire population of people to describe the attitudes, opinions, behaviours, or characteristics of the population. A stratified Random Sampling technique was used to select the sample for this study. The stratified Random Sampling technique was selected because the researcher intended to treat the four (4) different departments within the School of Information Technology, Federal Polytechnic Nasarawa as strata so that all the departments were represented in the study. The sample was selected from HND students from the four departments in the School of Information Technology, Federal Polytechnic. The researcher divided the entire population into different subgroups or strata and selected the sample randomly but independently of each stratum to ensure the presence of the subgroup within the sample (Emaikwu, 2015). For the sample size, Yamane

Taro (1967) method of sample size calculation was used to determine the sample of three hundred and seventy (**370)** HND students for the study. The instrument used for data collection was a structured questionnaire that measured the level of HND students' ICT Awareness, Access, Literacy, and Competency (ICT-AALC). The internal consistency of the instrument was determined using Cronbach Alpha and a reliability coefficient of 0.537 for awareness, 0.660 for accessibility, 0.882 for literacy, and 0.888 for competency. The overall reliability estimate of the instrument was 0.934. The data collected using a structured questionnaire were analyzed using mean and standard deviation.

Result

Table 1: Level of HND Students' Awareness of ICT Facilities for Research

S/N	Item	n	M	SD	Decision
1	Physical ICT facilities (such as computers, ICT centres, and hard disk drives) to conduct my research	358	1.79	1.02	PA
2	Internet connectivity I can use in conducting my research	358	1.87	1.01	PA
3	Software packages such as SPSS, Minitab, etc that are necessary for conducting my research	358	2.26	1.13	PA
4	Online databases that contain e-books and e-journals to conduct my research	358	2.25	1.59	PA
5	Offline databases that contain e-books and e-journals to conduct my research	358	2.37	1.11	PA
	Grand Mean		2.11	0.24	

Key: *N = number of respondents, M = mean, SD =standard Deviation, Fully Aware (**FA**) = 1.00-1.49, Partially Aware (**PA**) =1.50-2.49, and Not Aware (**NA**) =2.50-3.00*

Table 1 shows the mean response and standard deviation of the level of awareness of ICT facilities among HND students in the school of Information Technology, FPN. Three scales FA (Fully Aware), PA (Partially Aware), and NA (Not Aware) were used to indicate respondent's level of awareness of the ICT research facilities in the School of Information Technology. The result shows that all the items had their mean value ranging from minimum and maximum of 1.50 – 2.49. Items 1, 2, 3, 4, and 5 from the result had mean ratings within the range of 1.50 - 2.49 Partially Aware (FA), which means that HND students in the School of Information Technology are partially aware of the ICT facilities for research purposes. While there are no items that fall within the mean range of Fully Aware (NA) 1.00-1.49 and Not Aware (NA) 2.50 – 3.00. The items have a grand mean of 2.11 which falls within the mean range of partially aware (PA) 1.50-2.49. This generally indicates that HND students in the School of Information Technology are partially aware of the ICT facilities for research purposes.

Table 2: Level of HND Students' Accessibility to ICT Facilities

S/N	Items	n	Mean	Std. Deviation	Decision
1	Computers, ICT centres, and hard disk drive conduct my research	358	2.02	0.97	PA
2	Internet connectivity to conduct my research	358	1.94	0.97	PA
3	Software packages (such as SPSS, Minitab etc) that are necessary for conducting my research	358	2.24	1.09	PA
4	Online databases that contain e-books and e-journals to conduct my research	358	2.25	1.06	PA
5	Offline databases that contain e-books and e-journals to conduct my research	358	2.44	1.19	PA
6	**Grand mean**		**2.18**	**0.09**	

Key: *N = number of respondents, M = mean, SD =standard Deviation, Fully Access (**FA**) = 1.00-1.49, Partially Access (**PA**) =1.50-2.49, and Not Access (**NA**) =2.50-3.00*

Table 1 shows the mean response and standard deviation of the level of accessibility of ICT facilities among HND students in the School of Information Technology, Federal Polytechnic Nasarawa. Three scales FA (Full Access), PA (Partial Access), and NA (No Access) were used to indicate respondents' level of accessibility to the ICT research facilities in the School of Information Technology, Federal Polytechnic Nasarawa. The result shows that all the items had their mean value ranging from minimum and maximum of 1.50 – 2.49. Items 1, 2, 3, 4, and 5 from the result had mean ratings within the range of 1.50 - 2.49 Partial Access (PA), which means that HND students in the School of Information Technology, Federal Polytechnic Nasarawa have partial access to the ICT facilities for research purposes. While there are no items that fall within the mean range of Full Access (FA) 1.00-1.49 and No Access (NA) 2.50 – 3.00. The items have a grand mean of 2.18 which falls within the mean range of 1.50-2.49 (Partial Access). This generally indicates that HND students in the School of Information Technology, Federal Polytechnic Nasarawa have Partial Access to the ICT facilities for research purposes in the Polytechnic.

Table 3: Level of HND Students' Literacy of ICT Facilities for Research

S/N	Items	M	SD	Decision
1	I know how to use the internet to search for any information for my research work.	1.56	0.82	K
2.	I know how to get tutorial videos online for my analysis.	1.92	0.99	K
3.	I know how to use external storage devices like Flash to download or upload files for my research.	1.72	0.87	K
4.	I know how to attach files in an e-mail.	1.72	0.94	K
5.	I know how to type my research work.	1.60	0.81	K
6.	I know how to edit my research work (bold, italic, font size, etc.) after typing	1.51	0.74	K
7.	I know how to search for journal articles for my research.	1.73	0.89	K

8.	I know how to create and manage files and folders for my research.	1.76	0.96	K
9.	I know how to use statistical packages (such as SPSS, Minitab, MS Excel, SAS, etc.) for my research analysis.	2.24	1.23	K
10.	I know how to use social networks (Facebook, WhatsApp, Twitter, etc.) to get up-to-date information for my research.	1.92	1.09	K
11.	I know how to connect online to get an e-journal for my research.	1.85	0.98	K
12.	I know how to connect with other researchers online to aid my research.	2.20	1.09	K
13.	I know how to search online databases for my research.	1.99	0.95	K
14.	I know how to use the social media to enhance my research.	1.89	0.91	K
15	I know about research websites (such as Academia, Research Gate, etc.) that are useful for getting materials for my research.	1.89	0.94	K
16	I know about research websites that are useful for sharing my research.	2.02	0.99	K
17	I know about research websites that are useful for publicizing my research.	2.17	1.04	K
18	I know about research websites that are useful for getting people who work in the same research area.	2.10	1.14	K
19	Grand mean	1.88	0.12	

Key: *N = number of respondents, M = mean, SD =standard Deviation, Highly Knowledgeable (HK) = 1.00-1.49, Knowledgeable (K) =1.50-2.49, Not Knowledgeable (NK) =2.50-3.00.*

Table 3 shows the mean response and standard deviation of the level of literacy of ICT among HND students in the School of Information Technology, Federal Polytechnic Nasarawa. Three scales Highly Knowledgeable (HK), Knowledgeable (K), and Not Knowledgeable (NK) were used to indicate respondent‘s level of ICT literacy for research facilities among HND students in the Polytechnic. The result shows that all eighteen items had their mean value ranging from minimum and maximum between 1.50 – 2.49. Items 1 to 18 from the result had mean ratings within the range of 1.50 - 2.49 (Knowledgeable), which means that HND students in the School of Information Technology, Federal Polytechnic Nasarawa have Knowledge of the ICT facilities for research purposes. While there are no items that fall within the mean range of Highly Knowledgeable (HK) 1.00-1.49 and Not Knowledgeable (NK) 2.50 – 3.00. The items have a grand mean of 1.88 which falls within the mean range of Knowledgeable (K) 1.50-2.49. This generally indicates that HND students in the School of Information Technology, Federal Polytechnic Nasarawa are Knowledgeable on the ICT facilities for research purposes in the Polytechnic.

Table 4: Level of HND Students' Competency of ICT Facilities for Research

S/N	Items	M	SD	Decision
1.	I use the internet to search for any information for my research work.	1.74	1.37	C
2.	I use tutorial videos online for my analysis.	2.28	1.10	C
3.	I use external storage devices like Flash to download or Upload files for my research.	1.76	0.93	C
4.	I used to attach files in an e-mail.	1.73	0.92	C
5.	I used to type my research work.	1.71	0.92	C
6.	I use it to edit my research work (bold, italic, font siz etc.) after typing.	1.63	0.91	C
7.	I used to search for journal articles for my research.	1.73	0.90	C
8.	I used to search for journal articles for my research.	1.74	0.83	C
9.	I use statistical packages (such as SPSS, Minitab, MS Excel, SAS, etc) for my research analysis.	2.16	1.10	C
10.	I use social networks (Facebook, WhatsApp, Twitter, etc to get up-to-date information for my research.	1.98	1.12	C
11.	I used to connect online to get e-journals for my research.	1.96	1.04	C
12.	I used to connect with other researchers online to aid my research.	2.18	1.09	C
13.	I used to search online databases for my research.	1.99	0.99	C
14.	I use the social media to enhance my research.	2.07	1.01	C
15	I use research websites (such as Academia, Research Gat etc) that are useful for getting materials for my research.	1.94	0.99	C
16	I use research websites that are useful for sharing my research.	2.12	1.07	C
17	I use research websites that are useful for publicizing my research.	2.17	1.03	C
18	I use research websites that are useful for getting people who work in the same research area.	2.16	1.01	C
19	**Grand Mean**	**1.95**	**0.12**	

Key: *N = number of respondents, M = mean, SD =standard Deviation, Highly Competent (HC) = 1.00-1.49, Competent (C) =1.50-2.49, Not Competent (NC) = 2.50-3.00.*

Table 4 shows the mean response and standard deviation of the level of competency of ICT among HND students in the School of Information Technology, Federal Polytechnic Nasarawa. Three scales Highly Competent (HC), Competent (C), and Not Competent (NC) were used to indicate respondent's level of ICT competency for research among HND students in the Polytechnic. The result shows that all eighteen items had their mean value ranging from minimum and maximum between 1.50 – 2.49. Items 1 to 18 from the result had mean ratings within the range of 1.50 - 2.49 (Competent), which means that HND students in the School of

Information Technology, Federal Polytechnic Nasarawa are competent in the use of ICT facilities for research purposes. Whereas there are no items that fall within the mean range of Highly Competent(HC) 1.00-1.49 and Not Competent(NC) 2.50 – 3.00. The items have a grand mean of 1.95 which falls within the mean range of Competent(C) 1.50-2.49. This generally indicates that HND students in the School of Information Technology, Federal Polytechnic Nasarawa are Competent in the usage of ICT facilities for research purposes in the Polytechnic.

Discussion

The findings of this study were discussed and compared with similar studies in the literature. The discussion followed the main research findings of the study. The results showed that all five items have a mean range from minimum to maximum of 1.50 – 2.49 and the cluster/grand mean of respondents on level of awareness of ICT facilities for research is 2.11 which means that HND students in the School of Information Technology, Federal Polytechnic Nasarawa are partially aware of the ICT facilities for research purposes. While there are no items that fall within the mean range of Fully Aware (NA) 1.00-1.49 and Not Aware (NA) 2.50 – 3.00. The items have a grand mean of 2.11 which falls within the mean range of partially aware (PA) 1.50-2.49. This generally indicates that HND students in the School of Information Technology, Federal Polytechnic Nasarawa are partially aware of the ICT facilities for research purposes. The result also revealed that the standard deviation of all five items ranged from a minimum to a maximum of 1.01-1.59. The average deviation between the respondents is 0.24, which shows that there is not much deviation between the respondents on their level of awareness of ICT research facilities in the Polytechnic. Its findings also showed that HND students are partially aware of the ICT facilities such as computers, computer centers, internet connectivity, etc. The result also indicated that HND students are partially aware of the software packages such as SPSS, SAS, Minitab, MS Excel, and databases that contain e-books and e-journals that are useful for the conduct of research in the Polytechnic. These software packages and databases are very important facilities for research purposes by HND students in the Polytechnic. However, despite the ICT facilities for research, the HND students at the Polytechnic are only partially aware of the facilities. However, there was no item from the result that the HND students are not aware of in the Polytechnic, though they are not fully aware of all the ICT facilities. This result agrees with the findings of Chimah and Udo (2015) and Udoka and Tansu (2017) who reported the awareness of ICT facilities by students in Nigerian universities. Another result showed that all five items have a mean range from minimum to maximum of 1.50 – 2.49 and the cluster/grand mean of respondents on the level of accessibility of ICT facilities for research is 2.18. This means that HND students in the School of Information Technology, Federal Polytechnic Nasarawa have partial access to the ICT facilities for research purposes. While there are no items that fall within the mean range of Full Access (FA) 1.00-1.49 and No Access (NA) 2.50 – 3.00. The items have a grand mean of 2.18 which falls within the mean range of 1.50-2.49 (Partial Access). This generally indicates that HND students in the School of Information Technology, Federal Polytechnic Nasarawa have Partial Access to the ICT facilities for research purposes in the Polytechnic. However, the findings also revealed that the standard deviation of all five items ranged from minimum to maximum of 0.97 -1.19 and the average deviation between the respondents is 2.18 which shows that there is not much deviation between the respondents on their level of accessibility of ICT facilities for research purposes in the Polytechnic. These computers, computer centers, and internet connectivity are very important facilities for research purposes by HND students. It could also be seen from the findings that HND students have

access to ICT facilities (such as computers, computer centers, internet connectivity, etc). This result agrees with the findings of Adigun, Mohammed, and Temboye (2016) and Daniel (2014) their separate studies showed that ICT facilities are available in the universities and a large number of students have access to the ICT facilities. The findings also showed that all 18 items have a mean range from minimum to maximum between 1.50 – 2.49. The cluster/grand mean of respondents on level literacy of ICT facilities for research is 1.88, which means that HND students in the School of Information Technology, Federal Polytechnic Nasarawa have Knowledge of the ICT facilities for research purposes. While there are no items that fall within the mean range of Highly Knowledgeable (HK) 1.00-1.49 and Not Knowledgeable (NK) 2.50 – 3.00. The items have a grand mean of 2.11 which falls within the mean range of Knowledgeable (K) 1.50-2.49. This generally indicates that HND students in the School of Information Technology, Federal Polytechnic Nasarawa are Knowledgeable on the ICT facilities for research purposes in the Polytechnic. Moreover, it was also found that the standard deviation of all eighteen items ranged from minimum to maximum between 0.74 to 1.23 and the average deviation between the respondents is 0.12. This shows that there is not much deviation between the respondents on their level of literacy of ICT facilities for research purposes in the Polytechnic. It could also be seen from the findings that HND students are literate in the knowledge of ICT facilities for research (such as computers, the internet, SPSS, Minitab, online databases, research websites, etc.). This result was contrary to the findings of Emwanta & Nwalo (2013) and Abubakar &Adetimirin (2015) who in their separate studies found low level of ICT literacy among students. Finally, the results showed that all 18 items have a mean range from minimum to maximum between 1.50 – 2.49. The cluster/grand mean of respondents on the level of competency of ICT facilities for research is 1.95. This means that HND students in the School of Information Technology, Federal Polytechnic Nasarawa are competent in the use of ICT facilities for research purposes. Whereas there are no items that fall within the mean range of Highly Competent (HC) 1.00-1.49 and Not Competent (NC) 2.50 – 3.00. The items have a grand mean of 2.11 which falls within the mean range of Competent (C) 1.50-2.49. This generally indicates that HND students in in School of Information Technology, Federal Polytechnic Nasarawa are Competent in the usage of ICT facilities for research purposes in the Polytechnic. It also found that the standard deviation of all the eighteen items ranged from minimum to maximum between 0.83 - 1.37. The average deviation between the respondents is 0.12, which shows that there is not much deviation between the respondents on their level of competency of ICT usage for research purposes in the Polytechnic. It could also be seen from the findings that HND students are competent in the use of ICT facilities such as computers, the internet, SPSS, Minitab, online databases, research websites, etc. The findings of this research were contrary to the findings of Ahmad, Karim, Din, and Albakri (2013) and Adekunjo & Unuabar (2018) who in their separate studies found that the ICT competency level of students was below average.

Conclusion

It was concluded that most of the HND students in the School of Information Technology, Federal Polytechnic Nasarawa are partially aware of ICT facilities for the conduct of research work in the Polytechnic. Furthermore, most of the HND students have partial access to the ICT facilities for the conduct of research work in the Polytechnic. However, most of the HND students are knowledgeable of the ICT facilities for research purposes in the Polytechnic. The findings also revealed that most of the HND students are competent in the use of ICT facilities for research purposes in the School of Information Technology, Federal Polytechnic Nasarawa,

Nasarawa state.

Recommendation

It was recommended that the Polytechnic Management should create more awareness of the available ICT facilities in the institution to its HND students for research purposes. This would in one way increase the number of HND students who use the ICT facilities for research daily.

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