PERCEPTION OF INFORMATION AND COMMUNICATION TECHNOLOGY STATUS AMONG LECTURERS AND STUDENTS ON TEACHING AND LEARNING OF ENGINEERING IN FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

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Abstract

The study investigated the perception of Information and Communication Technology (ICT) status among lecturers and students on teaching and learning of engineering in Federal University of Technology, Minna. The Federal University of Technology, Minna is supposed to provide adequate ICT facilities and resources for teaching and learning in SEET and both Staff and Students of SEET are supposed to use these ICT facilities and resources in the teaching and learning process. However, the reverse is the case and therefore the need for this study. Cross sectional survey research design was adopted for the study. The sample of 1060 engineering staff and students randomly drawn from the eight (7) departments in the School of Engineering and Engineering Technology, Federal University of Technology, Minna in Niger State, Nigeria was used for the study. Two specific purposes and two research questions guided the study. Researcher developed questionnaire was used and administered in order to obtain the relevant information from the respondents. The instrument was subjected to content validity index (CVI) by three independent assessors from SEET. To establish the reliability of the instrument (Utibe-abasi sceptre stephen, 2013), the instrument was trial tested on 120 students and 15 staff of School of Agriculture and Agricultural Technology (SAAT), Federal University of Technology, Minna and a reliability coefficient of 0.86 was obtained using Cronbach Alfa method. Data obtained were analyzed using frequency count and percentage. The findings of the study revealed among others that 25% of the respondents have PC or laptops, access to internet services and uses them for academic matters, 75% of the respondents agree that projectors are available during the lecture hours. The followings recommendations were made among other; The University administration should provide internet access to students and also provide them with PCs in order to improve and facilitate their learning, Lecturers of SEET should be encourage to use projector during teaching.

Keywords: Information and Communication Technology, Teaching and Learning, Engineering

Introduction

Information and Communications Technology (ICT) is an umbrella term that includes any communication device or application, such as: projector, visualizer, radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as video conferencing and distance learning (Israel, 2014). With this definition, it is difficult and maybe even impossible to imagine today and future learning environments that are not supported, in one way or the other by Information and Communication Technologies.

The current widespread diffusion and use of ICT in modern societies, especially by the young ones, (the so-called digital generation) then, it should be clear that ICT will affect the complete learning process today and in the future (Kenway & Bullen, 2014). But to what extent is this ICT available and accessible at Federal University of Technology, Minna remain a question to be answered from time to time, in the face of huge amount of capital investment on equipment and manpower noticeably the present laying of optic fibre cable connecting Gidan-Kwano to Bosso Campus. This is an effort by the University administration to increase the accessibility of the available network. There is a widespread belief that ICTs have an important role to play in changing and modernizing educational systems and ways of learning (Olokoba, 2014) and (Yves, Dieter, & Marcelino, 2006). The teaching of engineering requires theoretical and practical demonstration of courses that are mostly mathematical and graphical in nature. Federal University of Technology, Minna is one of the specialized Federal Universities in Nigeria with nine (9) Schools of which School of Engineering and Engineering Technology (SEET) is one of them. The SEET also has nine (9) academic departments, these including; Agriculture and Bio-resources, Civil, Electrical and Electronics, Mechanical, Chemical, Telecommunications, Computer, Mechatronics, Materials and Metallurgical Engineering.

Information and Communication Technology in the past decades have not revolutionized science, engineering and technology at an unprecedented speed. This has led to short research cycle, short product design and redesign time, broader and deep understanding of teaching and learning, (Sunday, 2010). According to Opira (2010), during the last two decades, countries (including Nigeria) have invested heavily in ICT. Indeed, the use of ICT in education and training has been a key priority in Nigeria in the last decade, although progress has been uneven. ICT has had a major impact on the education sector, on organization and on teaching and learning methods (Chang, 2001). Yet there are considerably different ICT expenditure levels between institutions within the country. Some schools have embedded ICT into the curriculum, and demonstrate high levels of effective and appropriate ICT use to support teaching and learning across a wide range of subject areas. However, some other schools are in the early phase of adopting ICT, characterized by important enhancements of the learning process, some developments of e-learning (ICT-enabled learning), but without any profound improvements in learning and teaching (Yves, Dieter, & Marcelino, 2006; and Kenway & Bullen, 2014). There is, however, little evidence on the perception of ICT to the learning domain in Nigeria higher education of learning especially engineering despite the effort of the last decades. Therefore, the need for the study.

Purpose of the Study
The study assesses the perception of information and communication technology status among lecturers and students on teaching and learning of engineering in Federal University of Technology, Minna. Two specific purposes guided the study, these are;
(i)   Determine the availability and accessibility of ICT facilities for teaching and learning of engineering
(ii)   Determine the adequacy of ICT resources for teaching and learning of engineering

Research Questions
The following research questions raised guided the study:
(i)   What ICT facilities are available and accessible for teaching and learning of engineering?
(ii)   How adequate are ICT resources for teaching and learning of engineering?

Research Methodology
The study employed a cross-sectional survey research design. Cross sectional design allowed

for the study of the population at one specific time and the difference between the individual groups within the population to be compared. The study was carried out among undergraduate students and staff of School of Engineering and Engineering Technology, Federal University of Technology Minna. The population of (SEET) Federal University of Technology, Minna as at 2012/2013 session for other departments and 2015/2016 session for Mechatronics department is presented in Table 1. Lecturers formed part of the study because of their roles in the teaching and learning process in the University.

Table 1: Categories of Respondents

Level	Mechanical	Civil	Electrical	Agric.	Mechatronics	Telecom	Chemical
500	106	150	150	85	0	29	130
400	93	120	170	46	0	32	99
300	138	120	160	45	0	55	126
200	183	160	250	12	30	52	154
100	144	160	160	120	76		150
Total	664	710	890	308	106	168	659

Random sampling technique was used to draw 1000 students and 60 staff (respondents) and seven (7) departments in the School of Engineering and Engineering, Federal University of Technology, Minna used for the study. The instrument used for data collection was a questionnaire developed by the researcher and comprises of two sections (A and B). Section (A), dual on personal information, while section (B) was further divided into four parts to address each research question. The instrument was subjected to content validity index (CVI) by three independent assessors from SEET. To establish the reliability of the instrument (Utibe-abasi sceptre stephen, 2013), the instrument was trial tested on 120 students and 15 staff of School of Agriculture and Agricultural Technology (SAAT), Federal University of Technology, Minna and a reliability coefficient of 0.86 was obtained using Cronbach Alfa method. The researchers administered the copies of the questionnaires to the respondents with the help of research assistants. Items which needed clarification were explained to the respondents. Data obtained were analyzed using frequency count and percentages. The sample selected and category of the respondents that took part in the study is herein presented in Table 2.

Table 2: Sample Selection and Category of Respondents

Categories	Number	Sample	Percentage
Students	8, 000	1000	80 %
Lecturers	215	60	20 %
Total	8215	1060	100.0 %

Table 3: Frequency Count and Percentage of Respondents (students) that Participated in the Survey and Distribution of Respondents ACCORDING to Year of Study

Attributes	Level	Freq. Count	Percentage
Year of study	100L	230	23%
	200L	240	24%
	300L	180	18%
	400L	160	16%
	500L	190	19%

Total		1000	100%
Department	Agric. Eng.	90	9%
	Chemical Eng.	190	19%
	Civil Eng.	200	20%
	Electrical Eng.	250	25%
	Mechanical	190	19%
	Mechatronics	30	3%
	Tel Com.	50	5%
Total		1000	100%

Results
Research Question 1
What ICT facilities are available and accessible for teaching and learning of engineering?

Table 4: **Frequency Count and Percentage of Respondents on their Opinion on the availability and a ccessibility of the Students in using ICT Facilities for Teaching and Learning of Engineering**

ICT Resources	Status	Freq. Count	Percentage
Computers/pc in classroom	Not sure	750	75 %
	Fairly available	150	15 %
	Available	100	10 %
Total		1000	100%
Internet & E-mail	Not sure	575	57.5 %
	Fairly available	325	32.5 %
	Available	100	10 %
Total		1000	100 %
Television set	Not sure	425	42.5 %
	Fairly available	375	37.5 %
	Available	200	20 %
Total		1000	100 %
Projector	Not sure	250	25 %
	Fairly available	450	45 %
	Available	300	30 %
Total		1000	100 %
Software	Not sure	320	32 %
	Fairly available	470	47 %
	Available	210	21 %
Total		1000	100 %
Computer laboratory	Not sure	100	10 %
	Fairly available	505	50.5 %
	Available	395	39.5 %
Total		1000	100 %
Video conferencing	Not sure	825	82.5 %
	Fairly available	175	17.5 %
	Available	0	0 %
Total		1000	100 %

From table 4, the following findings were revealed about the availability and accessibility and skills using ICT facilities: 25% of the students have PC or laptops, access to internet services and uses them for academic matters. 75% of the students agree that projectors are available during the lecture hours. 70% of the students have and can use relevant software for academic purposes. About 90% of the students indicate that computer laboratories are available and assessable. All the respondents agreed that 17.5% of the staff and students use video conferencing in curriculum implementation.

Research Question 2

How adequate are ICT resources for teaching and learning of engineering?

Table 5: **Frequency count and percentage of respondents on their opinion on adequacy of ict resources for teaching and learning of engineering**

ICT resource	Status	Freq. Count	Percentage
Computers/ pc in classroom	Inadequate	750	75 %
	Fairly adequate	150	15 %
	Adequate	100	10 %
Total		1000	100 %
Internet &E-mail	Inadequate	575	57.5 %
	Fairly adequate	325	32.5 %
	Adequate	100	10 %
Total		1000	100 %
Television set	Inadequate	425	42.5 %
	Fairly adequate	375	37.5 %
	Adequate	200	20 %
Total		1000	100 %
Projectors	Inadequate	250	25 %
	Fairly adequate	450	45 %
	Adequate	300	30 %
Total		1000	100 %
Software	Inadequate	320	32 %
	Fairly adequate	470	47 %
	Adequate	210	21 %
Total		1000	100%
Computer laboratory	Inadequate	100	10 %
	Fairly adequate	505	50.5 %
	Adequate	395	39.5 %
Total		1000	100 %
Video conferencing equipment	Inadequate	750	75 %
	Fairly adequate	175	17.5 %
	Adequate	75	7.5 %
Total		1000	100 %

Table 5 show the following findings were revealed about the adequacy of ICT resources: 25% of the respondents agree that PC or laptops are adequate, while 75% of the respondents also agree that projectors are adequate for use during the lecture hours. 68% of the respondents indicate that software is adequate for academic purposes. 90% of the respondents indicate that computer laboratories are adequate. 25% of the respondents agreed that video conferencing is adequate for curriculum implementation.

Findings

The findings of this study revealed that;

(i)   25% of the respondents have PC or laptops, access to internet services and uses them for academic matters

(ii)   75% of the respondents agree that projectors are available during the lecture hours

(iii)   70% of the respondents have and can use relevant software for academic purposes

(iv)   About 90% of the respondents indicate that computer laboratories are available and assessable

(v)   All the respondents agreed that 17.5% of the staff and students use video conferencing in curriculum implementation.

(vi)   25% of the respondents agree that PC or laptops are adequate

(vii)   while 75% of the respondents also agree that projectors are adequate for use during the lecture hours

(viii) 68% of the respondents indicate that software are adequate for academic purposes

(ix)   90% of the respondents indicate that computer laboratories are adequate

(x)   25% of the respondents agreed that video conferencing is adequate for curriculum implementation.

Recommendations

Based on the findings of the study, the following recommendations were made:

(i)   The University administration should provide internet access to students and also provide them with PCs in order to improve and facilitate their learning

(ii)   Lecturers of SEET should be encourage to use projector during teaching

(iii)   Lecturers should be encourage to use computer in their teaching

(iv)   Internet facilities should be provided to staff offices

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