SURVEY OF TERTIARY EDUCATION STUDENTS' ACCEPTANCE AND USAGE OF DIGITAL TECHNOLOGIES ON LEARNING IN NIGER STATE

BY

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Abstract

This study investigated the survey of tertiary education students' acceptance and usage of digital technologies on learning in Niger State. The sample comprised of 76 (46 males and 30 females) year two students was used selected by random sampling techniques from population of 250 science education students from school of sciences education in Niger State. The research design adopted was descriptive survey design. One validated instrument was used with reliability coefficient of 0.77. Tertiary Education Students Digital Technology Questionnaire (TESDITEQ) was used for data collection. Four research questions were raised and answered using mean and standard deviation while two null hypotheses were tested at $\alpha = 0.05$ level of significant using t- test and ANOVA . The findings of the study indicated that there was no significant difference between male and female of tertiary education students' on acceptance of digital technologies on learning and also there was no significant difference between male and female of tertiary education students' usage of digital technologies facilities in the institution. Based on the findings of the study, it was recommended that digital technology should be used in teaching and learning of biology in Colleges of Education and university in Niger State Nigeria, also students of higher institution of learning should adopt usage of digital technology to improve on the concept that is difficult to learners in biology.

Keywords: Digital, technology, tertiary education, acceptance, usage.

Introduction

Traditionally, education is relies on sources such as information electronic media, library, off-line or on-line and other digital sources. The learner assesses information sources by enrolling with schools, teachers and libraries (Ndaku, 2013). Prior to the digital era, information was not accessible by the majority of people, and even those accessed were unable to obtain current information with respect to today context. The modern society wants to know the information as it happens and when it happens, and the world is moving from an information society to a knowledge society. Thus, education is given the highest priority and brain power is becoming the most valuable asset of an organization. Advances in digital technology have opened up many avenues of learning. Technologies have made information accessible and transmittable from anywhere and by to all groups of people. Education has reached most part of the world and Information Communication Technology (ICT) has become an integral part of human life.

Times have changed and our lives are continually being intertwined with technology in ways we never thought possible even a decade ago. Technology continues to expand as diverse groups of higher institutions adopts both blended and online learning. This situation lends credence to the view expressed by Warlick (2014) that infusing technology into teaching and learning processes has become imperative and no longer negotiable. He asserts that ''we need technology in every classroom and in every student's and teacher's hand because it is the pen and paper of our time, and it is the lens through which we experience much of our world (Warlick, 2014). Technology has become effective at replacing low-level instructional duties. It can administer and score multiple-choice assessments to dozens, even hundreds of students simultaneously in a fraction of time it would take any teacher. And no teacher has the patience to match technology when it comes to presenting and representing content cover and over, whether reading a text, watching a video, or interacting with animations or other media so students can view and review as much content as often as they need to (Nwazor, & Godwin-Maduike, 2015).

Science and technology have always been recognized as critical factors in the process of development. Through its application, the resources of nations have been transformed into goods and services all over the world. Abdulkadir (2016) remarked that the current development in science and technology has greatly affected the lives of every human being such that, to be ignorant of the basic knowledge of this development is to live an empty, meaningless and probably unrealistic life. Nwona and Akogun (2015), stressed that for any nation to attain the status of self-reliance, science must be an important component of that nation

irrespective of race, creed or sex. Science is defined as the systematic body of knowledge obtained by methods or techniques based on observation and experimentation as its authority. It seeks to explain the natural phenomenon using enquiry processes or activities. The branches of science are: biology, physics, chemistry, among others and can be broadly classified into natural and applied sciences (Dimaculangan, *et al.,* 2022). The role of technology in education has been an important question since the potential of computer technology to transform Skinner's teaching machines was recognized in the 1960s. It remains an important issue today with debates about the impact of technology on our society, the implications of quick and easy online access to information for knowledge and learning and the effect of technology on young people's social, emotional and physical development frequently in the news.

In view of the above, Pleasants, Clough, & Olson, (2019) opined that science contributes to the quality of life in such areas as health, nutrition, agriculture, transportation, material and energy production, and industrial development. He further stated that it ensures that the air we breathe, and the water we drink are life sustaining, and not vectors of disease and decay. In Nigeria, the inclusion of science subjects in the school curriculum is to promote national development as the nation adopts more science oriented policies and programmes in education (Ehindero, 2014). Poor performance of students is mainly due to lack of motivation from teachers; poor infrastructural facilities; attitude of students toward learning; lack of modern teaching skills and competence by science teachers; and lack of opportunities for professional development of science teachers (Bosco, et al., 2023 and Nicola, 2012). Siddiquah and Salim (2017) who's investigated ICT facilities, skills, usage, and the problems faced by the students of higher education; believe that the use of ICT supports their learning. Slow speed of computers, signal problem in Internet, virus threat, poor working condition of computers, load shedding, and lack of access of Internet are the problems faced by the majority of the students. In another view, Ernest (2019) carried out study on using technology acceptance model to promote students adoption and use of digital technologies. The study revealed that respondents had developed positive attitudes and right perceptions toward the use of digital technologies during lessons because they gained more understanding and insight through the lively course content they offer. Respondents now have the belief that the intervention has helped them to develop the zeal to adopt and use digital technologies to enhance their learning.

Statement of the Problem

Over the years, science education in Nigeria has faced various challenges. The school curriculum offers a student-centered teaching-learning approach as students are encouraged to take up the science related subjects including biology, which

occupies a unique position in the school curriculum and is central to many science related courses (Momoh, 2017).Poor performance in science subjects in colleges of education has been a serious concern to educationists, business organizations and government at large (NCCE Digest, 2015). This problem has been due to a lot of factors which include the absence of incentives and motivation on lecturers so as to increase their efficiency and effectiveness in order to bring about improved performance of students. The increase of poor performance and failures in science courses (in general) and Biology in particular in higher tertiary institutions may lead to a big loss for both individual students whose aim was to continue with higher education and pursue a career, but all of that may be compromised as a results of poor performance in science courses, and this may affect the nation, whose aim is to have professionals in various science fields like medicine, communication, industries, geology, building and construction, just to mention a few, in order to achieve its technological developmental goals (Akbari, et al., 2012).

Williams, and Adesope (2016) who investigated a research topic titled Undergraduates' Attitude towards the use of Social Media for Learning Purposes. The finding shows that students can explore topics that they are interested in through online social networking. Students use Facebook, Twitter, WhatsApp, Skype, YouTube, Opera Mini and WeChat for educational purposes. Also, there was significant difference between social media usage of male and female respondents. The result indicates that significant differences exist in social media preference between respondents in favour of female. Yasemin (2011) who conducted study on gender differences in using social networks. The results revealed that significant differences were found between genders in favor of male. Muideen (2011) undertook a research titled an assessment of student's usage and availability of ICT facilities in colleges of education: problems and prospects. The study found that, students made use of the available facilities in their colleges; ICT facilities were widely used in instruction process.

Aim and Objectives of the Study
The aim of this study is to find out the survey of tertiary education students' acceptance and usage of digital technologies on learning in Niger State**.** Specifically, it strives to achieve the following objectives:

1. To determine tertiary education students acceptance to use of digital technologies on learning in their institution.
2. To determine tertiary education students usage of digital technologies facilities in their institution.
3. To determine gender of tertiary education students acceptance to use of digital technologies on learning in their institution

4. To determine gender of tertiary education students usage of digital technologies facilities in the institution.

Research Questions

The study specifically sought to provide   answers to the following research questions:

1. What is the mean difference tertiary education students' acceptance to use of digital technologies on learning in their institution?
2. What is the mean difference tertiary education students' usage of digital technologies facilities in the institution?
3. What are the mean differences of male and female of tertiary education students' on acceptance of digital technologies on learning in their institution?
4. What are the mean differences of male and female of tertiary education students' usage of digital technologies facilities in the institution?

Research Hypotheses

The following Null hypotheses were formulated and tested at 0.05 level of significance:

HO_1: There is no significant difference in the male and female of tertiary education students' on acceptance of digital technologies on learning in their institution

HO_2: There is no significant difference in the male and female of tertiary education students' usage of digital technologies facilities in the institution

Methodology

The research adopted the descriptive survey design. According to Kpolovie (2010), descriptive survey design is appropriate for obtaining factual, attitudinal or behavioral information from selected samples. It is considered appropriate for this study because the tertiary education students' will be investigated through the use of questionnaire. The population of the study comprised of all the tertiary education students' from school of sciences education in Niger State. There are Two Hundred and Fifty sciences education students' in the school of sciences .The sample comprises of 76 (46 male and 30 female) science education students selected by random sampling techniques from school of sciences education, in Niger State. The tertiary institutions used are, namely: the Federal University of Technology, Minna, Federal College of Education, Kontagora and Niger State College of Education. The instrument used to generate data was a questionnaire titled: Tertiary Education Students Digital Technology Questionnaire (TESDITEQ). The questionnaire was designed by the researcher made up of two sections.   Section A, B and C. Section A consists of demographic information (school, department, age and gender), section B was on acceptance of digital technologies by the students with 10 items on a 5 point Likert scale. The respondents were expected to choose from options: Never, Almost Never, Some Time, Almost Every time, and every time. The

instrument was administered on the respondents and retrieved on the spot after completion. Section C requested opinion of respondents' on usage of digital technologies by tertiary education students. The instrument was face and content validated by two science education lecturers from department of Science Education in Niger State. The test items were thereafter reduced from 17 to 13 and later reduced to 10 items according to experts recommendations. Their corrections were incorporated into the final form of the instrument before administration. Pearson Product Moment Correlation was used to determine the reliability, 0.77 co-efficient was obtained which was considered reliable for the study, the 5 point Likert scale assigned weights as follows: For positive response: Never (N), 2, Almost Never (AN), 3. Some Time (ST), 4. Almost Every time (AE),   5. Every time (ET).

Results

Research Question One: What is the mean difference tertiary education students' acceptance to use of digital technologies on learning in their institution?

Table1:
Mean and Standard Deviation of Acceptance

SN	Item	N	$\bar{X}$	SD	Decision
Q1	Digital services provided by tertiary institution are acceptable.	76	3.28	1.053	Agree
Q2	Digital services provide by tertiary institution are fast.	76	1.84	.543	Disagree
Q3	Digital services provided by tertiary institution are reliable.	76	1.30	.566	Disagree
Q4	The school's digital library is efficient	76	3.70	1.244	Agree
Q5	Links to educational resources websites and E-journals can be found on the university's website.	76	3.71	1.081	Agree
Q6	Interactive white boards are available in the institution.	76	4.29	.907	Agree

		N	$\bar{X}$	SD	
Q7	Computers are adequately provided.	76	1.97	.588	Disagree
Q8	Digital Video Disk and players are available.	76	3.62	1.032	Agree
Q9	Flash drives/ External hard drives are adequately provided.	76	2.55	.755	Disagree
Q10	E-Books are adequately provided.	76	3.59	1.048	Agree
	Grand mean		3.31	3.949	

Decision mean = 3.0

Table 1: shows the mean and standard deviation of tertiary education students' acceptance to use of digital technologies on learning in their institution. This indicates that six items scores more than 3.0 decision mean, which imply that six of the items were accepted out of ten, since grand mean is 3.31, an indication that the tertiary education students' acceptance to use of digital technologies on learning in their institution. The implication is that, the acceptance to use of digital technologies on learning in their institution is favourable since six out of ten items on acceptance show agreed based on decision mean.

Research Question Two: What is the mean difference of tertiary education students' in the usage of digital technologies on learning in their institution?
Table 2:
 Mean and Standard Deviation of Usage of Tertiary Education Students' in the Usage of Digital Technologies

	Item	N	$\bar{X}$	SD	
Q1	How often have you receive digital based lectures?	76	1.41	.657	Disagree
Q2	How often do you browse/ search the internet for resource materials for your assignments?	76	3.37	1.37	Agree
Q3	How often do you down load/ upload materials from your school website?	76	2.97	1.423	Disagree
Q4	Do you have a lot of funs activities during digital lectures?	76	3.67	1.482	Agree

Q5	Are students allowed to use laptops, tablet and note-book at school for learning?	76	3.92 1.431	Agree
Q6	When taught in class using digital facilities, are students equipped with computers and or with digital devices?	76	1.89 .419	Disagree
Q7	How often do you communicate with your parents or guardians through digital facilities?	76	3.70 1.265	Agree
Q8	How often do you have online chat with your friends and classmates through digital facilities?	76	3.47 1.137	Agree
Q9	When taught in class, does the lecturer uses a computer or digital devices?	76	1.33 .598	Disagree
Q10	When taught in class, does both the lecturer and students use computer and digital devices in teaching and in learning?	76	1.34 .579	Disagree
	Grand mean		3.04 5.519	

Decision mean=3.0

Table 2 shows the mean and standard deviation of tertiary education students' on the usage of digital technologies facilities in the institution. This indicates that five items scores more than 3.0 decision mean, since grand mean = 3.04 which imply that five of the items were accepted out of ten, an indication that the tertiary education students' usage of digital technologies on learning in their institution is positive. The implication is that, usage of digital technologies on learning in their institution is favorable since five out of ten items on usage show agreed based on decision mean.

Research Question Three: What are the mean differences of male and female of tertiary education students' on acceptance of digital technologies on learning in their institution?

Table 3:

Mean and Standard Deviation of Acceptance of Digital Technologies on Learning in their Institution.

	N	$\bar{X}$	SD
Male	46	33.48	3.58
Female	30	32.73	4.479

Table 3 shows acceptance of male and female of tertiary education students' on digital technologies on learning in their institution. Male had mean of $\bar{X} = 33.48$, SD = 3.58 and Female had mean of $\bar{X} = 32.73$, SD = 4.47. The mean of male was slightly higher than their female counterpart by 0.75. The implication is that, there is no disparity between male and female students' on digital technologies acceptance on learning in their institution.

Research Question Four: What are the mean differences of male and female of tertiary education students' usage of digital technologies facilities in the institution?

Table 4:

Mean and Standard Deviation of Usage of Digital Technologies on Learning in their Institution

	N	Mean	SD
Male	46	30.52	4.29
Female	30	30.23	7.07

Table 4 shows male and female tertiary education students' usage of digital technologies on learning in their institution. Male had mean of $\bar{X} = 30.52$, SD = 4.29 and Female had mean of $\bar{X} = 30.23$, SD = 7.07. The mean of male was slightly higher than their female counterpart by 0.29. The implication is that, there is no disparity between male and female students' on digital technologies usage on learning in their institution.

Hypothesis One: There is no significant difference in the male and female of tertiary education students' on acceptance of digital technologies on learning in their institution

Table 5:

Summary of ANOVA on male and female of tertiary education students' on acceptance of digital technologies on learning in their institution

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	10.076	1	10.076	0.643	0.42
Within Groups	1159.345	74	15.667		
Total	1169.421	75			

Table 5 shows the finding of the analysis of variance on the male and female of tertiary education students' on acceptance of digital technologies on learning in their institution, revealed that f (1, 74) = 0.64 p= 0.42 With this finding, the

hypothesis was accepted because p-value of 0 .42 on the table was greater than the pre-set level of significant of p>0.05. The implication is that there was no significant difference between male and female of tertiary education students' on acceptance of digital technologies on learning in their institution.

Hypothesis Two: There is no significant difference in the male and female of tertiary education students' usage of digital technologies facilities in the institution

Table 6:

Summary of ANOVA on male and female of tertiary education students' on usage of digital technologies on learning in their institution

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.510	1	1.510	0.49	.825
Within Groups	2282.845	74	30.849		
Total	2284.355	75			

Table 6 shows the finding of the analysis of variance on the male and female of tertiary education students' on usage of digital technologies on learning in their institution, revealed that f (1, 74) = 0.49 p= 0.83 With this finding, the hypothesis was accepted because p-value of 0.83 on the table was greater than the pre-set level of significant of p>0.05. The implication is that there was no significant difference between male and female of tertiary education students' usage of digital technologies facilities in the institution.

Discussion of Results

Null hypotheses one presented in table 5 showed that there was no significant difference between male and female of tertiary education students' on acceptance of digital technologies on learning in their institution, f (1, 74) = 0.64, p >0.05.Hence the null hypothesis stated was accepted. This could be ascribed to the active involvement and participation of both male and female students in the digital technology acceptance. Which make the findings in contrary to the work of Yasemin (2014) who conducted study on gender differences in using social media. The results revealed that significant differences were found between genders in favor of male. Also concur with Muideen (2015) who study found that, students made use of the available facilities of the college; ICT facilities were widely used in instruction process. The findings is in line with the work of Ernest (2019) that indicates that respondents had developed positive attitudes and right perceptions

toward the use of digital technologies during lessons because they gained more understanding and insight through the lively course content offer.

Table 6 result reveals that there was no significant difference between male and female of tertiary education students' usage of digital technologies facilities in the institution f(1, 74)= 0.49, p > 0.05. Hence the null hypothesis stated above was retained the outcome might be as a result of both genders having abilities on the usage of digital technology in learning of biology concepts in order to meets their learning need. This confirmed the study of Onasanya., *et al* (2014) whose finding shows that gender has no effect on the attitude of lecturers toward integration of ICT into teaching and research in tertiary also in line with Siddiquah and Salim (2017). They believe that the use of ICT supports their learning. Slow speed of computers, signal problem in Internet, virus threat, poor working condition of computers, load shedding, and lack of access of Internet were some of the problems faced by the majority of the students.

Conclusion
Student's acceptance could influence students' usage of digital technology materials in learning. Digital technology can serve as learning platform to learn sciences specifically biology at students pace.

Recommendations
1   Digital technology should be used in teaching and learning of biology in   Colleges of Education in Niger State Nigeria.
2   Students of higher institution of learning should adopt usage of digital technology to improve on the concept that is difficult to learners.

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