RELATIONSHIP BETWEEN STUDENTS' ICT BACKGROUND EXPOSURE, ACCESS TO ICT LEARNING FACILITIES AND ACADEMIC ACHIEVEMENT IN UNDERGRADUATE EDUCATIONAL TECHNOLOGY PROGRAMME

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Abstract

Crucial to the actualization of a student's educational technology goal is the usage of Information and Communication Technology (ICT) resources. It was on that premise that this study was carried out to examine the relationship between students' ICT background exposure, access to ICT learning facilities and academic achievement in undergraduate educational technology programme at Federal University of Technology, Minna, Nigeria. The study adopted a mixed-design approach using descriptive survey and ex-post facto design. A multi-stage sampling procedure was used to select 100 educational technology undergraduates and two research instruments were used for data collection. The instruments were subjected to validation and reliability checks. Two research questions were formulated, and two corresponding null hypotheses were tested at 0.05 alpha level of significance. Data gathered were analysed using mean, standard deviation and Pearson Product Moment Correlation formula. Findings revealed that there was no significant relationship between students' ICT background exposure and academic achievement, also, no relationship exists between access to ICT learning facilities and students' academic achievement. It was therefore recommended among others that, educational technology students should be educated and enlightened on proper usage of information and communication technology tools in order to enhance their academic achievement.

Keywords: Information and Communication Technology, ICT Background and Access, Academic Achievement, Educational Technology, Learning Facilities

Introduction

Information and Communication Technology (ICT) is increasingly being integrated into education globally. As a result of this, teaching and learning are being improved as ICT tools have the tendencies to bring about effectiveness, efficiency and improved academic performance of students which is the rationale for establishing schools. It is seen as a catalyst of system and its use can positively transmit knowledge to students and help them exploit enormous possibilities for acquiring information, thereby facilitating learning (Ben Youssef & Dahmani, 2008). ICT facilities required at school are electronic in nature and are usually classified into audio, audio-visual, mobile, social media, computer and internet resources. Bolstad (2004) highlighted the ICT facilities to be used in teaching and learning process to include computer hardware and software, digital cameras and video cameras, the Internet and telecommunication tools.

Information and Communication Technology (ICT) is one of the most efficient tools for advancing knowledge and skills, and it is highly needed for quality education to take place and attention is being given to the integration of ICT driven learning process (Falode & Adewale, 2014; Falode, *et al.,* 2016). Today, ICT is an integral part of teaching and learning process and students who do not have background usage and who do not have access to it are likely not to do well academically

compared to their counterparts with early exposure and regular access. The ICT background exposure of students in tertiary institution differs. Some of the reasons for the difference are based on the previous level of ICT exposure at secondary school, availability and presence of relevant devices at home, and previous ICT training enrolled for before securing admission to institutions of higher learning. Students with early ICT exposure will be able to make use of computer system to process word documents, analyse data, develop small computer programmes, browse internet and install software (Idowu 2004). This was buttressed by Adeyinka and Mutala (2008) who stated that students with ICT background usage will easily be able to save and open a file, use a word processing program, send and receive e-mail among others.

Erhan and Okan (2011) posited that due to improvements in technology, ICT have become affordable and sophisticated, hence, parents are able to equip their households with such technologies for the benefits of their children. This was buttressed by Lauman (2000) who stated that the availability of computers for educational purposes is growing and the number of computer technologies at home is also growing. Parents believe that using computers and having access to computer related technologies has likelihood of increasing children's academic achievement, hence, they buy computers with an internet connection to help their children in their academic endeavours (Erhan & Okan, 2011). Early exposure to ICT is essential, so also, regular access to it for academic activities at school is crucial to students' improved academic performance. Despite the increase in the number of computers and related technologies, everyone does not have the same access to these technologies (Erhan & Okan, 2011). Students are dependent on both the ICT possibilities offered by the school and that which they have outside of school (Wajszczyk, 2014).

Regular and uninterrupted access to ICT facilities within and outside the school premises, the type and quality of personal learning facilities, and previous ICT competence determine level of access to ICT facilities needed to enhance learning. Access to adequate and satisfactory ICT infrastructure is one of the most significant factors that contribute to the successful and effective utilization of IT in all subjects and for all learners, and the presence of ICT in schools is an essential condition for the successful introduction of creative educating methods and techniques (Wajszczyk, 2014). Access to ICT facilities provides valuable learning experiences, therefore giving the student educational benefits in line with the school's educational programme. Access to ICT facilities have positive impact on students' academic success (Wajszczyk, 2014). For instance, internet gives a learner access to information on a wide variety of subjects, people, organizations and places all over the globe.

Studies on impact of ICT on students' achievement showed mixed results. While some research revealed that ICT does not play key role in students' achievement in higher education, for instance, (Angrist & Lavy, 2002; Banerjee, et al., 2004), some research revealed that ICT has real impact on students' academic achievement (for instance, Sosin et al., 2004; Fushs & Wossman, 2004). Specifically, Attewell and Battle (1999) found that there was positive association between having computer at home and students' mathematical performance at school. Fuchs and Woessman (2004) in a study found that there was a positive significant correlation between the availability of ICT and students' performance. Leuven et al. (2004) found a consistently negative and marginally significant relationship between ICT use and student achievement measures. Also, Notten and Kraaykamp (2009) stated that availability of information and communication technologies such as computer and television at home has positive impact on students' performance in science while

Wajszczyk (2014) also found that access to ICT facilities have positive impact on students' academic success.

Today, many courses of study in institutions of higher learning depends on the application of information and communication technologies. Notably among such disciplines is educational technology. It is regarded as the application of scientific process and products to teaching and learning process in order to improve learning, enhance teaching and bring about effectiveness and efficiency in the education sector. Educational technology undergraduate programme focuses on a student learning to apply and integrate information and communication technology processes and devices into teaching and learning after graduation. As such, students studying the course must be ICT savvy.

It has however been observed that, despite the fact that all students studying the course at Federal University of Technology Minna are subjected to the same course contents, are being taught by the same lecturers and despite the fact that they all study in the same learning environment, their academic achievements differ. While some have high achievement, some have medium and others have low achievement in educational technology. Since learning to integrate ICT facilities into teaching and learning is what is being studied in the course, and ICT are the resources being used in the dissemination of instructional content and are also being used by learners themselves in the acquisition of knowledge, educational technology students' previous ICT background and current access to the resources may help to determine the rationale for difference in their academic achievement. Hence, this study was carried out to determine the relationship between students' ICT background exposure, access to ICT facilities and achievement in undergraduate educational technology programme.

Research Questions
The following research questions guided this study:
1. Is there any relationship between students' ICT background exposure and their academic achievement in educational technology programme?
2. Is there any relationship between students' access to ICT learning facilities at school and their academic achievement in educational technology programme?

Research Hypotheses
The following null hypotheses were formulated and tested in this study:
HO_1: There is no significant relationship between students' ICT background exposure and their academic achievement in educational technology programme?
HO_2: There is no significant relationship between students' access to ICT learning facilities at school and their academic achievement in educational technology programme?

Methodology

This study adopted a mixed-method approach using descriptive survey research design and ex-post facto design. Descriptive survey research design was employed to elicit the responses of students regarding their ICT background exposure and their access to ICT learning facilities as undergraduates. Ex-post facto design was employed in the collection of the existing academic results of respondents. Students' ICT background exposure and access to ICT learning facilities served as independent variables while students' achievement in undergraduate educational

technology programme served as the dependent variable of this study. The independent variables were separately correlated against the dependent variable to determine the relationship that exist.

The population of the study was made up of all the 251 undergraduate educational technology students at Federal University of Technology Minna, Nigeria during the 2016/2017 academic session. A multi-stage sampling procedure was employed to select a total of 100 students who served as research sample. Stratified sampling technique was used to classify students to their academic levels, thereafter, purposive sampling procedure was used to select only year one and year two classes as students in other levels came in through direct entry mode of admission having successfully completed a three-year course of study at a College of Education. Finally, simple random sampling technique was used to select 50 students each from year one and year two classes.

Two research instruments were used for data collection. They are Questionnaire on Students' ICT Exposure and Access (QSIEA) and Educational Technology Academic Scores (ETAS). The questionnaire comprised of three sections (Sections A, B & C). Section A was used to collect students' demography (level, identification code), Section B and C comprise of 15 items each on students' ICT background exposure and current level of access to ICT learning facilities. The items were structured using 5-point Likert scale response mode of Strongly Disagree (1 point), Disagree (2 points), Undecided (3 points), Agree (4 points) and Strongly Agree (5 points). The questionnaire was validated by two educational technology experts and two computer experts. Thereafter, pilot study was carried out on a sample of 20 randomly selected year two students of science education department who offer educational technology as a borrowed course. Cronbach Alpha formula was used to calculate the reliability coefficient of the instrument and 0.76 and 0.82 values were obtained for Section B and C respectively. The questionnaire was therefore found reliable and suitable for the study.

ETSA was used to collect students' academic scores. Their Cumulative Grade Point Average (CGPA) as undergraduate in the department of educational technology were collected from the department and awarded scores. A CGPA below 1.50 was awarded 40 points, 1.50 – 2.49 was awarded 45 points, 2.50- 2.99 was awarded 50 points, 3.00-3.49 was awarded 55 points, 3.50-3.99 was awarded 60 points, 4.00 to 4.49 was awarded 65 points and a CGPA between 4.50 and 5.00 was awarded 70 points.

The researcher personally administered the questionnaire on the selected respondents and also collated their CGPA. Data gathered were analysed using Mean, Standard Deviation and Pearson Product Moment Correlation formula using Statistical Package for Social Sciences (SPSS Version 20.0). Analyses obtained were used to provide answers to the two research questions ad were also used to test the two null hypotheses. Significance level of accepting or rejecting the hypotheses tested was ascertained at 0.05 alpha level.

Results

The two research questions generated for this study were directly translated to the null hypotheses tested. Hence, the descriptive summary in Table 1 and its interpretation were used in providing answers to the questions while the summary in Table 2 -5 and their interpretations are the results of the analyses meant for testing the hypotheses.

Table 1:
Descriptive summary of data collected and analysed

	ICT Background	ICT Access	Achievement
N	100	100	100
Mean	64.87	62.60	53.45
Median	64.50	63.00	55.00
Mode	61	63	55
Std. Deviation	13.472	16.688	7.272
Minimum	20	20	40
Maximum	93	92	65

Table 1 shows the descriptive summary of data collected for this study. Specifically, the table reveals the number of respondents, mean, median, mode, standard deviation, minimum and maximum scores of the variables of study. From the table, the average mean scores of 64.87 and 62.60 (out of possible 100) indicate good ICT background exposure of students and good access to ICT facilities. However, the average mean score of 53.45 indicate average academic achievement of students in educational technology.

H_{O1}: There is no significant relationship between students' ICT background exposure and their academic achievement in educational technology programme.

Table 2:
PPMC analysis of relationship between students' ICT background and academic achievement

		Correlations	
		ICT Background	Achievement
ICT Background	Pearson Correlation	1	-.012
	Sig. (2-tailed)		.907
	N	100	100
Achievement	Pearson Correlation	-.012	1
	Sig. (2-tailed)	.907	
	N	100	100

Table 2 shows the Pearson Product Moment Correlation analysis of students' ICT background and achievement in educational technology. The analysis was carried out to determine the relationship between the two variables. The table reveals that there was a low negative relationship between students' ICT background and their achievement in educational technology, which was however not statistically significant ($r = -0.12$, N=100, $p > 0.05$). In other words, there was no significant relationship between students' ICT background and academic achievement in educational

technology. This implies that increase in students' ICT background exposure does not indicate improved academic achievement in educational technology programme.

H$_{O2}$: There is no significant relationship between students' access to ICT learning facilities at school and their academic achievement in educational technology programme?

Table 3:
PPMC analysis of relationship between students' access to ICT and academic   achievement

Correlations			
		Achievement	ICT Access
Achievement	Pearson Correlation	1	-.053
	Sig. (2-tailed)		.597
	N	100	100
ICT Access	Pearson Correlation	-.053	1
	Sig. (2-tailed)	.597	
	N	100	100

Table 3 shows the Pearson Moment Correlation analysis of the relationship between students' access to ICT and academic achievement. The analysis was carried out to determine the relationship between students' access to ICT learning facilities and their academic achievement in educational technology. The table reveals that there was a low negative relationship between students' access to ICT learning facilities and their achievement, which was not statistically significant (r = -0.053, N=100, p > 0.05). In other words, there was no significant relationship between students' access to ICT learning facilities and academic achievement in educational technology. This implies that increase in students' access to ICT learning facilities does not indicate improved academic achievement in educational technology programme.

Discussion

The findings of this study revealed that there was no relationship between students' ICT background and their academic achievement in educational technology. Another finding also revealed that no significant relationship exists between students' access to ICT learning facilities and their academic achievement in educational technology. These findings are at variance to the earlier findings of Attewell and Battle (1999) who found that positive association exists between having computer at home and students' performance at school, Fuchs and Woessman (2004) who found that there was a positive significant correlation between the availability of ICT and students' performance, Leuven *et al.* (2004) who found significant relationship between ICT use and students' achievement measures, Notten and Kraaykamp (2009) who observed that availability of information and communication technologies at home has positive impact on students' performance in science and that of Wajszczyk (2014) who found that access to ICT facilities have positive impact on students' academic success.

Though students have ICT background and access to ICT learning facilities, wrong usage and priority to use such resources for entertainment purposes at the expense of their academic endeavours could be responsible for lack of relationship between ICT and students' academic achievement in educational technology.

Conclusion

This study reveals that educational technology students have good ICT background as well as good access to ICT learning facilities. However, these are not reflected in their academic achievement in educational technology which was just about average. It can be inferred that students have not been putting good use of their ICT background and access to ICT learning facilities with regards to their academic endeavours, hence no relationship was found among the variables.

Recommendations

Based on the findings that emanated from this study, educational technology undergraduate students should be educated and enlightened on proper usage of information and communication technology tools to enhance their academic achievement. Parents, guardian, teachers and mentors should discourage students from using ICT resources solely for entertainment and communication purposes but should rather prioritize usage for academic activities which have positive implications towards the realization of their career goals.

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