International Journal of Women in Technical Education and Employment
ISSN: 2811-1567. Volume 3 – Issue 2. December 2022
https://fpiwitedjournal.federalpolyilaro.edu.ng

ICT Usage and Academic Learning of Students (Case Study of Federal Polytechnic Ede, Osun State, Nigeria)

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ARTICLE HISTORY
Received: September 6, 2022
Revised: September 24, 2022
Accepted: November 2, 2022

Abstract

Academic learning is a cornerstone in education, which involves period of development of student's knowledge, skill, and experience within an academic environment. However, students' academic learning is perceived to be having challenges like inadequate instructional facilities, in-conducive learning environment, inadequate security, among others. The ripple effect is perceived on the overall academic learning of students in Federal Polytechnic, Ede. This study therefore examined the influence of ICT usage on academic learning of students in Federal Polytechnic, Ede. A descriptive survey design was employed. The population of the study comprised of 14,140 students. The sample size for the study was 375 students. The study utilized stratified random sampling technique. Structured questionnaire was used and data were analyzed using simple percentage method and Linear Regression Analysis of SPSS to test the hypothesis at 0.05 level of significance. The result revealed that there is significant influence of ICT Usage on Academic Learning with a p-value is 0.000, which is less than 0.05. Conclusively, the study shows a relative high influence of ICT use on academic learning of the investigated Polytechnic. The study therefore recommended that management of Federal Polytechnic Ede should improve on provision of more learning equipment, collaborative tools and adequate security to improve student's concentration and learning.

Keywords: *Academic Learning; ICT Use; Instructional facilities; Collaborative Learning.*

Citation
Adenekan, T. E., Ikusemiju, F. A. & Ibironke, O. E. (2022). ICT Usage and Academic Learning of Students (Case Study of Federal Polytechnic Ede, Osun State, Nigeria). *International Journal of Women in Technical Education and Employment*, 3(2), 41 -47.

Introduction

Students' academic learning refers to the process where set of individuals in an academic environment acquire new skills or improve on existing knowledge, behavior, values, or preferences (Joan, 2013). Academic learning involves training that people go through in an institution of learning, which involves studying and reasoning. Academic learning has the capacity to enhance students' current state of knowledge and skills, enhance learning experiences, instructional approaches and academic support given to students. It focuses on imparting skills and practices that can enable lifelong learning, reasoning, and independent problem-solving in students. Academic learning help students to develop rich understandings, skills, knowledge and attributes that can be useful in professional lives (Sylvia & Horn, 2009).

Institutions as an organization aims at creating successful students, improving personal endowments, building capability levels; helping students overcome constraints, and build better future leaders (UNESDOC, 2015). And ICT, which is popularly known as Information and Communication Technology, is a tool for global educational development and refers to technologies that provide access to information through communications. ICT is a form of technology that aids creation, processing, storage, and retrieval of information, which makes communication easier. ICT can be in form of software (application software or system software); hardware (physical part of any computerized device); telecommunication (telephone network, radio broadcasting system, computer networks and the Internet); and cloud computing (scalable resources through various subscription models, chatbots, e-mail, cloud storage

of pictures and documents, customer relationship management or cloud customer service, backup and recovery, developing cloud applications, cloud hosting, social networking, and data analytics). ICT provides window of opportunity for educational institutions to harness and use technology to complement and support students' learning process. ICT keeps having influence on institutions around the world; and it is making dynamic changes in society and influencing all aspects of life. The role of ICT in education cannot be overemphasized, as it has contributed immensely to easy acquisition of knowledge, improvement on existing knowledge, self-study, and collaborative learning among students (Sara, et al., 2010). ICT has improved learning beyond classroom lectures, as it can be termed as a digital boom in educational sector. We live in a connected wired world, where students need to be taught on the best approaches to connections, collaborations and communications globally in order to remain relevant. ICT help in transforming the former isolated and bored classrooms into rich student-focused, bringing about more innovative and interacting learning environment; help students' learn to become independent and effective learners; help teachers use ICT facilities to enhance and motivate students' to learn in a more interesting way. ICT as a technological innovation in institutions, involves adoption of emerging learning technologies to support organizational or institution's work processes, which includes student's learning (Adenekan & Jimoh, 2021).

However, it is worthy to note that despite the benefits that ICT integration has brought to academic learning, there is no clear influence of ICT on students' academic learning; due to factors like lack of adequate learning facilities, lack of adequate power supply, inflation, poverty, admitted into a wrong study programme, in-conducive classroom, among others. Students are perceived to be facing more challenges like being mandated to buy personal laptops; student's lack of ICT knowledge to complete assignments, thereby contracting assignments to computer business operators; among others. Therefore, the need to ensure that ICT facilities are readily available and accessible by students in institutions is considered paramount. This study therefore seeks to examine the influence of ICT use on academic learning of students in Federal Polytechnic Ede, Osun State, Nigeria.

Concept of Academic Learning

Academic learning refers to acquisition of knowledge or skills through study, experience, or being taught at school, college, or university. Learning is a process of acquiring new understanding, knowledge, behaviors, skills, values, attitudes, and preferences. Learning can be immediate, induced by a single event, and may take some time to accumulate from repeated experiences; but the changes induced by learning often last a lifetime (National Academies of Sciences, Engineering, & Medicine, 2018). There are specific learning styles, because every individual has special way of learning, which if compelled to learn through other methods can become frustrating and fruitless. Learning can occur visually (with pictures and illustrations) (Ghulam, et al., 2015), audibly (with sounds like lectures, voice records, group discussions, etc.), verbally (with words like interview, one-on-one conversation), physically (by experience, getting involved in an event), and through reading and writing. Education provides an enlightening opportunity to learners, which is also identified as a process of imparting knowledge to learners (Adenekan, et al., 2018). Most academic learning takes place within a learning environment with the help of a trainer who moderates and regulates the flow of information and knowledge to learners. Academic learning can be defined as the acquisition of knowledge, information, understanding or skill on any subject matter. Learning can lead to change in behavior and improved performance; and it can take place anywhere.

To further explain the concepts of academic learning, three learning theory was evaluated and found to correspond with the study. These learning theories are behaviourism, cognitivism and constructivism; which described how students absorb, process, and retain knowledge during learning. In Behaviourism theory, learning occurs

with behavior management through actions, reinforcements, rewards and punishment. In Cognitivism theory, learning is a process of taking in information, processing it by thinking and using the information to produce outcomes. And lastly, in Constructivism theory, learning is a collaborative process from those whose proficiency level is higher, which helps students perform better.

Concept of ICT

ICT stands for information and communication technology, which includes technological tools that is useful for communication, information creation, processing, storage and retrieval (Prashanta, 2016). ICT is a technological innovation which is used for gathering, processing of data and dissemination of information (Rouleau, et al., 2015). ICT can be termed as all forms of technologies; for example, software, hardware, telecommunications, information management systems, applications, etc. which is used in creating, producing, analyzing, processing, distributing or transmitting information electronically. Use of ICT has changed the practices and procedures of nearly all forms of endeavor, as well as academics. ICT includes technologies like radio, television, video, DVD, telephones, mobile phones, etc. ICT is a technology that can handle information and communication processes effectively; and foster upgrading of business processes and operations, in order to meet up with latest trends in the economy market (Mwantimwa, 2019). ICT is a scientific and technological technique that helps in handling and transmission of information. ICT enhances exchange of information; access to many research articles; make collaborative learning more easier, easy research, etc. Use of ICT for academic learning has gone beyond teaching students computer skills. ICT in education involves using computers and technology as tools to enrich academic learning in various subjects (Baishakhi & Kamal, 2016). ICT is used in form of hardware (i.e., PC/Laptop, interactive boards, smartphones, printer, scanner, projector, CD/DVD, etc.); it is used in form of software (i.e. application software like Microsoft Word or WPS, Excel spreadsheets, Adobe PDF, chrome among others), which can be installed on either PC, laptop or smart devices; ICT is utilized in form of telecommunications (i.e. telephone network, the radio broadcasting system, computer networks and the Internet); and ICT is used in form of cloud computing (i.e. Google Cloud, Microsoft 365, Adobe Creative Cloud, etc.). Other ICT facility used for academic learning includes e-readers, tablets, projectors, digital cameras, Wi-Fi, teleconferencing/video conferencing, printing and photocopying machine, smart phone, pen drive, CDs and DVDs, among others.

ICT makes learning interesting to students and enhances interactive learning. It brings convenient mode of studying individually and assists management of institutions to improve on delivery of educational services to students (Syed, 2013). ICT improves academic learning processes, reduces barriers of place and time; enhances communication, interaction and bridges gap between developed and underdeveloped regions. ICT saves time, motivates students to learn, engages students, improves collaboration and teamwork; and unleash creativity in learning. ICT transforms traditional medium of learning, which involves learning only in classroom and laboratories, to learning corporately. With ICT, learning becomes more easier to students' and becomes more convenient; students uses computers, multimedia, internet, lectures and books for academic learning within and outside the classroom, anywhere and at any convenient time with ICT devices (Abolarinwa, *et al*., 2015). ICT in education has changed passive learning to active learning; textbook driven to research driven; changed memorized facts to students know-and-can-do; and changed literacy from reading and writing to literacy in critical thinking and innovation (Daniels, 2016). It also improves academic learning by facilitating administrative services to students in institutions, such as admission processing, registration, fee payment, transcript processing, result checking, etc. which equally bring relief to students and help save stress. ICT improves access to knowledge and offers unlimited means of achieving educational goals. ICT, as well provides different opportunities to make learning exciting and help students see subject matters in new ways (Raval, 2015). It helps encourage student's active participation in the class,

which in turn enhances knowledge retention. ICT provides great opportunities for students, because it helps them learn at anywhere and at any time (UNESCO, 2017). Today, almost all applications on various ICT devices allows independent learning, which means students are able to learn in relation to their own abilities and needs; thereby improving their level of reasoning and experience. Students learn useful life skills easily with ICT that help them gain skills that may be useful in the future (Edward, 2016). ICT not only develops technological skills, but also sharpens intelligence quotient (IQ) of students by improving learning through exchange of videos, images, audio clips, sound effects, online interactions like Google classroom and other exciting academic platforms that engages students, which may not be available traditionally. Using technology for learning can increase student's engagement in class, more than using school textbook.

To further explain the concept of ICT, Technology Acceptance Model (TAM) by Fred Davis and Richard Bagozzi (1989) was utilized. TAM model explains why people choose to use a technology because they find the technology useful for them and also find it easy to use. TAM explains that people's attitude towards use of technology will determine the behavior intention to use such technology and then actual usage (Viraiyan, *et al*., 2017). It focuses on user's perceived usefulness and perceived ease of use of technologies. Perceived usefulness refers to how a particular technology is believed to be useful; while perceived ease of use refers to how user's belief that the technology is easy to use and can help reduce efforts. TAM tries to understand the relationship between users' behavior, attitude and technology. The perceptions often determine user's acceptance or rejection of using a technology. The objective of the study includes: examining the state of academic learning of students in Federal Polytechnic Ede and examining the purpose of ICT usage of students in Federal Polytechnic, Ede.

Hypothesis

H_0: There is no significant influence of ICT Usage on Academic Learning of Students in Federal Polytechnic, Ede.

Methodology

Descriptive survey design was employed for the study. The instrument for data collection is structured questionnaire; and the instrument has four-point Likert rating scales. The questionnaire was administered to 375 students with the help of three research assistants, who were trained on how to administer, persuade, and collate the instruments from respondents. The research instrument returned was 361 which was 96.2% return rate. Data collected was analyzed using simple percentage method and Linear Regression Analysis of SPSS for test of hypothesis.

Result and Discussion

Table 1: State of Academic Learning of Students in Federal Polytechnic Ede.

State of Academic Learning	Frequency (Agreed)	Percentage
Conducive learning environment	285	79%
Adequate instructional equipment	210	58%
Adequate collaborative tools	198	55%
Adequate security	214	59%
Guidance and counseling	342	95%
Adequate Library	334	93%

Field work (2022)

Table 1 shows that 285 respondents representing 79% agreed that there is conducive learning environment; 210 respondents representing 58% agreed that there are adequate instructional equipment; 198 respondents representing 55% agreed that there are adequate collaborative tools;

214 respondents representing 59% were of the opinion that there are adequate security; 342 respondents representing 95% agreed that there are adequate guidance and counseling; while 334 respondents representing 93% were of the opinion that there is adequate library as support for student's academic learning. This result revealed that even though many of the respondents agreed that the institution supports student's learning with high acceptance in ensuring conducive learning environment, adequate library, and access to being guided and counseled, yet, there are low responses in adequate learning equipment, adequate collaborative tools and adequate security.

Table 2: Purpose of ICT usage of students in Federal Polytechnic Ede.

Purpose of ICT Usage of Students	**Frequency (Agreed)**	**Percentage**
Classwork and assignments	282	78%
Academic presentations	180	50%
Access education contents	340	94%
Collaborative learning	210	58%
For research	184	51%
For storing educational contents	330	91%

Field work (2022)

Table 2 shows that 282 respondents representing 78% agreed that they use ICT for classwork and assignments; 180 respondents representing 50% agreed that they use ICT for academic presentations; 340 respondents representing 94% agreed that they use ICT to access educational contents; 210 respondents representing 58% were of the opinion that they use ICT for collaborative learning; 184 respondents representing 51% agreed that they use ICT for research; while 330 respondents representing 91% were of the opinion that they use ICT for storing educational contents. This result shows that even though most of the respondents agreed that they use ICT for classwork and assignments, use ICT for accessing educational contents, and use ICT for storing educational contents, yet, there are low acceptance of using ICT for academic presentations, collaborative learning, and research.

Test of Hypothesis: There will be no significant influence of ICT Usage on Academic Learning of Students in Federal Polytechnic, Ede, Osun State.

Table 3: Model Summary of Linear Regression of ICT Usage on Academic Learning of Students in Federal Polytechnic, Ede, Osun State.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.787[a]	.619	.618	.61420	.619	583.018	1	359	.000

a. Predictors: (Constant), ICT usage

If $P < 0.05$; H_0 is rejected and H_1 is accepted. Since p value is 0.000 and it is less than 0.05, thus, the H_0 is rejected, while the H_1 is accepted. And the summary model also provided the R and R^2 values. The R value represent simple correlation, and 0.787 (R column) indicated a high degree of correlation. The R2 value (R Square column) indicated how much variation in the dependent variable "Academic Learning" was explained by the independent variable "ICT Usage". In this case, 61.80% can be

explained to be high even though with low positive percentage. This indicates that the level at which the Students use ICT for academic learning is moderately high.

Summary

The results showed that the level of academic learning and Students' ICT use in the Federal Polytechnic, Ede is considered satisfactory, even though with low positive response; thus, there is room for improvement on provision of adequate learning facilities to further enhance students' academic learning and ICT Usage.

Conclusion, Recommendations and Future Study

The study concludes that there is significant influence of ICT Usage on Academic Learning of Students in Federal Polytechnic, Ede, Osun State. The study thereby recommends that: Management of the institution should improve on provision of more learning equipment, collaborative tools and adequate security to improve student's concentration and learning. Lecturers in various departments should encourage students more on using ICT for academic presentations, collaborative learning, and research and finally, students should also ensure that the ICT facilities at their disposal should be used wisely for academic learning and reduce being distracted.

Suggestions for further study

Future research should focus on Human Computer Interaction and Academic Performance of Students. Other Polytechnics in Osun State may be included in further studies as well as a comparable study with other institutions.

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