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Idowu Adegbilero-Iwari

Afe Babalola University, Ado-Ekiti, Nigeria., adegbileroidowu@gmail.com

Oluwaseun O. Odefadehan

Elizade University Ilara-Mokin, Ondo State,

Olubunmi Idowu Owoeye Mrs.

Elizade University, Ilara-Mokin, Ondo State, Nigeria

Abraham Christopher

Elizade University, Ilara-Mokin

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ICT Skills of University Freshmen and their Projections for Improvement upon Graduation: A Case Study of Elizade University, Ilara-Mokin, Nigeria.

¹Adegbilero-Iwari, I., ²Odefadehan, O. O., ²Owoeye, O. I., & ²Christopher, A.

¹Afe Babalola University, Ado-Ekiti, ²Elizade University, Ilara-Mokin

Abstract

The paper reported the outcomes of the assessment of the information and communication technology (ICT) skills of freshmen in a Nigerian private university and the projection of the students for improvement at graduation. It became necessary in this digital era, where it is assumed the Millennial are digital natives, to know what computing capabilities fresh university students are coming with from their earlier educational exposures and also to know their expectations for ICT skills honing at higher educational level. The findings show that although many of the students are proficient users of varying devices (desktop, laptop and mobile devices), laptop is their preferred device for academic work. It also indicated that laptop and smartphones are their best choice for a device combination. The students are more skilful in E-mail (159%), web browsing (53%), online registration (57%), mobile apps use (53%), e-banking (49%), e-commerce (44%). Whereas they show interest in learning other skills, they indicated that the ICT unit is the arm of the university perceived to contribute the most to their skills improvement during the study years. Recommendations were made based on the findings.

Keywords: Information and communication technology skills, ICT skills, University freshmen, Elizade University, Nigeria, Academic library

Introduction

Information and Communication Technology (ICT) has become, over the years, one of the basic building blocks of modern society. In many nations of the world, understanding the importance of ICT and mastering the basic skills and concepts of it are now seen as part of the core issues of education. Oliver (2002) stated that one of the goals of educational institutions is to ensure that graduates are information literate and can identify, locate and evaluate relevant information to satisfy their information needs. This implies that graduates demonstrate not only skills and knowledge in their subject domains but also general attributes and skills that can make them function effectively in today's digital era. Having certain computing capabilities is now required for both learners and school management.

Although, secondary school leavers may have spent many hours engaging and communicating with electronic devices, they may not necessarily be equipped with the ICT skills that they need for tertiary study and thereafter. University students of today use computers and adjoining communication technologies to access course materials, research academic topics, communicate with lecturers and peers, write assignments, perform calculations, and also complete administrative functions. To be able to cope with these demands, students need a general understanding of computer concepts, and a range of basic information and communication technology (ICT) skills. However, having ICT skills goes beyond one's ability to use or interact with the computer.

ICT skills are “the capacity to solve problems of information, communication and knowledge in digital environments” (Claro et al., 2012). ICT skills have been described as mastery and usage of a range of computer programmes, software and other applications such as operating systems, spreadsheet, word processor, database managers, web tools (University of Birmingham, 2015). The University, on its Canvas platform, further stated the main attributes of ICT skills. They include: communication and interaction with other people using the internet resources such as emails; use of spreadsheet and database software to analyse and organise information; creating digital information in diverse formats through the use of appropriate computer programmes such as office software; and the ability to use computer operating systems, access programmes and operate the computer. In his study of knowledge of ICT skills of librarians in India, Kumar (2013) examined capability in the following as ICT skills: programming language, operating systems, application software packages, database management systems, library management software, web development tools and other online utilities and services.

The value of having ICT skills transcends the learning environment. Skills of using ICT is necessary in our emerging knowledge society and these involve the ability to solve increasingly complex problems in a variety of knowledge-rich domains, participate in knowledge work as well as engage in various networked activities. Rae (2005) reported that over half of the students (54.2%) he surveyed in a 2003 study of the Open University, UK, “thought that ICT is (or would be) ‘very important’ in their career”. It has also been indicated that students pursue acquisition of more ICT skills for use in their future career (Cuckle et al., 2000). Adetimirin (2012) clearly stated that, the use of ICT requires some skills to be able to retrieve the required information without much stress. The level of confidence of ICT skills and exposure to ICT of a student may affect use of ICT (Rae, 2005).

ICT and Education

The Information and Communication Technologies (ICT) is an umbrella term that includes any communication device or application, encompassing: 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.

Information and communication technology (ICT) is extensively occupying all the fields of workplaces (Hashm, Dahar & Sharif, 2019). Application of information technology (IT) knowledge, skills and understanding has become a reality for employees. Information and Communication Technology (ICT) has been identified as one possible means of leapfrogging poor economies from peasant to modern information societies (UNECA, 2003). Electronic devices, internet and computer have become pervasive and transformed humans' daily actions and habits (Littlejohn, Margaryan & Vojt, 2010).

Organizations, experts and practitioners in the education sector increasingly recognizing the importance of ICT in supporting educational improvement and reform. The use of information and communication technologies in education makes teaching – learning process effective and interesting. Adeogun (2003) emphasized that ICTs have broken the barriers of time, distance and location which use to impede the growth of formal education. According to Dywer (2000), computer motivates and caters for different learning abilities. The presence of computer-based technology changes the way subjects are being taught. According to Verhoeven et al. (2012) there are probably no universities where a student can survive without a reasonable knowledge of ICT. Cuckle et al. (2000) reported the varying range of ICT skills possessed by postgraduate students were acquired when they undergraduates in the university.

Freshmen and ICT Skill

Studies have been carried out on student's ICT skills level (Cuckle et al., 2000; Hossain & Sormunen, 2019; Israel & Edesiri, 2014; Rae, 2005). Some have researched the computing capabilities of fresh university intakes (Verhoeven et al., 2012). Even though, it is true that a large proportion of students opt for these new types of ICT applications, it does not mean that all students are equally familiar with them (Kennedy et al. 2008). A good deal of research has shown that every university expects new students to have appropriate basic computer skills (Oliver & Towers, 2000; McDonald, 2004). However, the transition from school to university

has proven to be particularly difficult for many new students. The challenges are even greater when the student is the first in their family to attend university (Olson, 2013).

Study conducted on students of Belgian university reported that some freshmen had little experience with Information and Communication Technologies (ICTs) but nevertheless, at the end of the first year, it becomes clear that not all of them have the necessary skills to work with all of the ICT resources available to them. They however found that, certain ICT capabilities of freshmen such as computer maintenance and website development improved after six months in the university (Verhoeven et al., 2012). Eyitayo and Eyitayo (2005), on computer literacy level of incoming students in the University of Botswana, revealed that almost an average were confident in basic introduction to computers, more than one third in Word processing while other applications were poorly rated. A study conducted by Lumande and Fidzani (2008) also revealed that fresh students do not adequately possess the required skills in Microsoft Word, PowerPoint, MS Excel, MS Access and internet, in computer when entering the university.

In universities, knowledge of ICT is required in almost every course. Oliver and Towers (2000) opined that in determining the level of skills required for benchmarking tertiary learners, the need to function independently in a web-based online learning environment should be a criterion. Internet's seemingly infinite information offers access to up-to-date research reports and global knowledge. In the light of this, Nwokedi (2007) asserted that "ICT has become an important component of electronic services in academic institutions. Therefore, the Internet has become an invaluable tool for learning, teaching and research (including collaborative research) in Nigeria"

If we want a society in which communication is very open, it is not enough to have access to new information technology; but, it is also necessary for all citizens to have the skills to use the technology and to be motivated to use it to communicate (Viherä & Nurmela, 2001). If this is true for a society, it is certainly true for a university. Although, it is stated that some ICT competences are well developed by many of today's university students, there are still differences between students, especially among those coming into the university newly. This paper assessed the ICT skill level of Elizade University's freshmen and their projections for improvement upon graduation.

Elizade University

The University was founded in 2012 and commenced academic activities in 2013. It was established by a Nigerian billionaire, Chief Michael AdeOjo, to boost the educational opportunities of young Nigerians in a conducive learning environment as world-class universities around the world. Elizade University is a private university situated in Ilara-Mokin, near Akure, the capital of Ondo State, Nigeria. Information on the University's website (<https://elizadeuniversity.edu.ng/Home/About>) show that:

the University aims to be an institution with the best traditions in the production of self-reliant, ethics-conscious, globally competitive graduates imbued with requisite skills, competencies and ability to be key players in the nation's quest for socio-economic and technological development. The University's learning environment comprises state-of-the art structures and infrastructural facilities, as well as teaching equipment that rank at par with those in educational institutions in developed countries.

The young university graduated its first set of graduates in 2015 and is currently in the process of commencing postgraduate programmes.

Objective of the study

The general objective of this study is to investigate ICT Skills of Elizade University freshmen in 2017/2018 academic session and their projection for improvement upon graduation in Elizade University.

The specific objectives are:

1. to ascertain the current ICT skills of undergraduate freshmen and plan for improvement;
2. to know the computing devices they would find most useful for their academic works;
3. to know undergraduate freshmen's plan for ICT skills improvement before graduation; and,
4. to assess undergraduate freshmen's perception of university units they hoped would contribute the most to their ICT skill improvement.

Methodology

The survey method was used to carry out this research and the target population was first year students (100 level) of various faculties in Elizade University for the year 2017/2018 academic session. The survey was taken after successfully completing a full semester in teaching the Use of Library and Information Literacy course (GST109). All the over 286 students that registered for the course were eligible to participate in the survey. Overall, 174 freshmen completed the survey giving the response rate of 60.84%. The web link to the online questionnaire designed on ©SurveyCrest platform was placed on the students' dashboard in iLearn, the learning management system used in Elizade University for teaching and conducting computer-based examination. The survey was analysed and downloaded from ©SurveyCrest and the results, in Tables, are discussed below using simple percentages.

Results and Discussion:

Table 1: Gender distribution of the respondents

Options	Response Percentage	Response
Male	62%	108
Female	38%	66
Total	100%	174

Table 1 revealed that 108 (62%) of the respondents were male while 66 (38%) were female. This showed that majority of the respondents that constituted the target population were male. This result reflect the population mix of the Nigerian state in which its population census indicated that there are more male than female Nigerians (World Population Review, 2020). It also agreed with existing studies that more male students have access to higher education than their female counterparts in Nigeria (Adeyemi & Akpotu, 2004; Oludayo et al., 2019). According to Longlands (2008), globally boys still enjoy a privileged position in terms of access to education and for every 100 literate men, there are still only 84 literate women.

Table 2: Faculty of respondents

Options	Response Percentage	Response
Arts and Humanities	11%	19
Social and Management Sciences	30%	52
Engineering	17%	29
Law	27%	47

Basic and Applied Sciences	15%	27
Total	100%	174

Table 2 showed that Faculty of Social and Management Sciences had highest response rate 52(30%) while Faculty of Arts and Humanities had a low output 19(11%). This showed that majority of the respondents that constituted the target population were from Faculty of Social and Management Science. The result agreed with the study of Rae (2005) where the largest respondents in his survey of the Open University of the UK identified as Social Science students.

Table 3: Usage Proficiency of Platforms or Devices

Options	Response Percentage	Response
Desktop	51%	89
Laptop	52%	91
Tablets	19%	33
Smart phones	48%	84
Total	170%	174

Table 3 revealed that majority of the respondent 91(52%) were proficient in the use of laptop, 89(51%) responded they were proficient in the use of desktop while 33(19%) which is the lowest, were proficient in the use of tablets. This result may represent the availability of the devices at the respondents' disposal and not necessarily their ability to use them.

However, this result agreed with the findings of a 2013 Marketing Charts survey which found that 85% of college students owned a laptop computer followed by smart phones (70%), tablets (36%). In the same vein, Kelly (2017), who sought the opinions of faculty members on the computing devices mostly used by their students, found that 57% lecturers singled out laptops as the students' favourite. It also supported the findings of (Mpofu, 2016) that more students use computers than mobile devices for many online activities.

Table 4: Students' Choice of Most Suitable Device for Academic Work

Options	Response Percentage	Response
Desktop	15%	26
Laptop	71%	124
Tablets	3%	5

Smart phones	11%	19
Total	100%	174

Table 4 showed that 124 (71%) of the respondents indicated that laptop was most suitable for their use followed by desktop computer 26 (15%). Moreover, 19 (11%) found smart phones most useful while 5 (3%) preferred the use of tablets. This showed that majority of the respondents preferred the use of laptop for academic activities i.e. doing assignments, preparation for seminar papers, registration of courses and some other vital things that pertain to their academics. This outcome is not unexpected as many of the students have laptop and smart phones which perform most of the functions of desktop computers and tablets respectively both of which may be cumbersome to carry. Accordingly, Mpofu (2016) had found that more students carry out many online educational and non-educational activities on laptops than mobile devices.

Moreover, a number of studies have reported that students believe that laptops make learning “easier” (Barak, et al., 2006; Mitra & Steffensmeier, 2000; Hyden, 2005; Weaver & Nilson, 2005). Students report that using a laptop to communicate with faculty via email is generally gratifying (Mitra & Steffensmeier, 2000), and that with email, they communicate with faculty more often and more freely (Arend, 2004). Demb et al. (2004) averred that laptops offer students the opportunity to engage in peer-to-peer communication via email, chat rooms, bulletin boards and instant messaging. Despite the affinity for using the computer, student satisfaction is higher when students report using the laptops for academic purposes (McVay, Snyder & Graetz, 2005).

Table 5: Students’ Choice of Most Suitable Device Combination for Everyday Academic Life

Options	Response Percentage	Response
Desktop/Laptop	23%	41
Desktop/Tablets	1%	2
Desktop/Smartphone	5%	8
Laptop/Tablets	5%	8
Laptop/ Smartphone	65%	113
Tablets / Smartphone	1%	2

Total	100%	174
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Further to the identification of the device most suitable to the respondents, the researchers thought it necessary, in this age of device proliferation and enhanced capabilities, to find the students' choice of device combination for their everyday academic life. Table 5 revealed that 113 (65%) indicated that laptop/smartphone are the most suitable device combination for their everyday academic life while 2 (1%) of the respondents affirmed that tablets/smartphone and desktop/tablets respectively are the least suitable for them.

This result agreed with EDUCAUSE finding reported by Brooks & Pomerantz (2017) that laptop and smartphone are the most popular combinations of computing devices for students. In fact, they found that 19 of 20 students own a laptop or a smartphone thus making laptop and smartphones to be, in their words, "king" and "queen" respectively. It also partly corroborated a report in The Washington Post by Debbie Truong that more students are learning on laptops and tablets (Truong, 2020). Past study by Fasae & Adegbilero-Iwari (2015) found that most students use smartphones for educational purposes. Specifically, mobile phone devices have become an essential part of daily life and a valuable means of information dissemination since its evolution in the late 1990s' in Nigeria and in developing countries according to Mojaye (2015).

Table 6: Students' Proficiency in and/or plan for ICT Skills

Options	Very Proficient	Proficient	Basic/ Learner	Not interest ed	Hope to learn it before graduation
Coding(programming)	3%(5)	6% (10)	24% (41)	6%(10)	56% (97)
Web design/development	5% (9)	6% (11)	16% (27)	5%(8)	61%(106)
Word processing (Microsoft word)	13% (23)	18% (31)	28% (48)	2%(4)	32%(56)
Spreadsheet (Excel)	9% (15)	13% (23)	26% (46)	7%(12)	37%(65)

Presentation/PowerPoint	10% (18)	13% (22)	22% (39)	6%(10)	40%(69)
Database management (Access, MySQL, etc.)	7% (12)	6% (11)	22% (39)	7%(13)	48%(83)
E-mail	37% (65)	22% (38)	16% (27)	4%(7)	13%(23)
Web browsing/navigation and Information search	38% (66)	15% (26)	11% (20)	4%(7)	23%(40)
Blogging (own a blog)	7% (13)	10% (17)	18% (31)	7%(12)	52%(91)
Mobile apps use and management	39% (67)	14% (25)	10% (18)	5%(8)	21%(36)
Data analysis (SPSS, others)	6% (10)	13% (23)	25% (44)	10%(18)	36%(63)
E-commerce (online purchases, konga, Jumia, etc.)	30% (52)	14% (24)	13% (22)	7%(15)	28%(48)
E-banking	31% (54)	18% (31)	14% (24)	5%(9)	25%(44)
E-learning, e-exams	36% (63)	15% (26)	21% (36)	2%(3)	21%(37)
Online registration	36% (62)	21% (37)	16% (28)	2%(3)	19%(23)

Table 6 shows the respondents' ICT skill proficiency using the combined score of Very Proficient and Proficient as measurement scales. The students were found to be more skilful in E-mail (59%), web browsing (53%), online registration (57%), mobile apps use (53%), e-banking (49%), e-commerce (44%). The result is related to the findings of Rae (2005) where

his study indicated that Word processor (87.7%), an e-mail program (81.2%), web browsing (79.9%) were the ICT skills his respondents, the Open University students, were most proficient in. It also aligned with the findings of (Ståhl, 2017) that first year students reported higher scores in basic computer and internet use with demonstrable skills.

They also indicated the ICT skills they were learner of or had basic skills in: coding (24%), web design (16%), Word processing (28%), spreadsheet (26%), PowerPoint (22%), data analysis (25%), e-learning (21%). These are some of the skills that have been reported to be useful for successful academic work in today’s universities (Nwokedi, 2007).

On the skills they hoped to learn before graduation; web design was top with 61%, while coding (56%), blogging (52%), presentation-powerpoint (40%), database management (48%) were the other skills the freshmen hoped to learn before graduation. These are some of the web-based skills that Oliver and Towers (2000) opined that students need to function independently in a web-based online learning environment.

Considering 6% and above, the result curiously showed that there were ICT skills some of the students were not interested in learning before graduation. These include: coding/programming (6%), spreadsheet (7%), presentation (6%), database management (7%), blogging (7%), data analysis (10%) and e-commerce (7%). Although, the reason for this was not sought but it may not be unconnected with individual differences and/or the perceived usefulness of the skills to such students at the time of the survey. It may also be that they were either already familiar with them or did not know about them.

Table 7: Perceived Significant Improvement in the Students’ ICT Skills during their Undergraduate Programmes

Options	Response Percentage	Response
Yes	89%	154
No	4%	7
Not sure	7%	13
Total	100%	174

Table 7 showed that 154 (89%) affirmed that they perceived significant improvement in their ICT skills during their undergraduate programmes, 7(4%) never perceived any improvement in their ICT skills while 13(7%) of the respondents were not sure.

The study clearly indicated that nearly all the students showed optimism on the significant improvement of their ICT skills before graduation. This corroborated Montiel (2006) that students' learning, understanding and application of learned objects are the basis of education. Advancement in technology in the handling, processing, accessing, storing, retrieving and dissemination of information in Libraries requires a holistic and pedagogical approach of instructing Library patron, especially new student, through a combination of conventional and contemporary methods to improve their knowledge and skill.

Table 8: University Units Students Expected to Contribute Significantly to their ICT Skills during the Undergraduate Programme

Options	Response Percentage	Response
University Library	15%	26
My department	20%	34
General studies unit (GST)	6%	11
ICT unit	59%	102
Other	1%	1
Total	100%	174

Table 8 showed that that majority of the respondents 102 (59%) affirmed that the university's ICT Unit will contribute significantly to their skills, 34 (20%) expected their various departments while 26 (15%) projected the University Library will help improve their ICT skills. The result indicated that the ICT unit or directorate is seen by the students as the arm of the University to contribute the most to their ICT skills improvement. This is, however, in dissonance with the report of Ali and Katz (2010) that suggested that fresh students would attain higher improvement in ICT literacy skills when faculty and library staff work together to develop training programme along their information literacy course.

Conclusion and Recommendation

The study has been able to shed more light on the ICT skills need of modern day university students having corroborated existing body of knowledge on the area of technology and education. Although, the study has indicated that modern learners at higher educational institutions are technology herbivores who can function well across devices, it has however revealed the preferred computing devices and the combination of devices the students found

most useful for their everyday academic life. These are laptops and smartphones. Importantly too, the study indicated the ICT skills fresh university students already have proficiency in and the ones they hoped to learn before graduation and the university unit that they perceived would contribute most significantly to it.

Summarily, the study has demonstrated its significance that university administration should pay attention on how they can help hone the ICT skills of students that will pass through their system in four or five years of the duration of their courses and we so recommend. Additionally, libraries in the Nigerian university system should be supported and empowered like their peers in developed countries to play more role in contributing to the ICT skill improvement of university students. Further research is also recommended to study why students think ICT Unit of the university is perceived to be the most contributor to ICT skill improvement of students during school life.

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