Journal of Capital Development in Behavioural Sciences Vol. 11 Issue 1 (March, 2023)
Faculty of Arts & Education, Lead City University, Ibadan, Nigeria
***ISSN Online:** 2449-0679 **ISSN Print:** 2354-3981*

Influence of Information and Communication Technology (ICT) Literacy on Academic Performance of Taraba State University Undergraduate Students, Jalingo

[1]Patience Okwudiri NWOSU
patsydearest@gmail.com
+234 808 640 4999

[2]Christopher Odida AWU
christopherawo@gmail.com
+234 817 087 0608
&
[3]Oluwayemisi Rebecca YUSUF
Greenflower136@gmail.com
+234 803 232 0187

[1&2]Department of Educational Foundations
Taraba State University, Jalingo
[3]Department of Educational Management
University of Ibadan, Ibadan

Abstract
The emergence of the computer age has made Information and Communication Technology necessary components of instruction, with the hope of improving students' level of performance in schools. However, the present situation of undergraduate students shows contradicting realities. This study investigated influence of ICT Literacy on academic performance of undergraduate students in Taraba State University, Jalingo. Two research questions and one hypothesis guided the study. Descriptive survey research design was used for the study. The population was 16,652 undergraduate students of Taraba State University Jalingo. A sample of 400 students was selected for the study using multi-stage sampling procedure. A fifteen-item instrument tagged "Information and Communication Technology Literacy Achievement Test (ICTLAT), with some items adapted from the existing instruments of John, Izang and Akorede (2017) and United Nations

Educational Scientific and Cultural Organization (UNESCO) Survey Instrument for ICT literacy was used for data collection. Mean and Standard Deviation were used to answer the research questions while independent t-test was used to test the null hypothesis at a 0.05 level of significance. Findings revealed that students' ICT Literacy was low and there was a significant mean difference between the Cumulative Grade Point Average (CGPA) of ICT literate students and the CGPA of ICT non-literate students in favour of the former ($t=12.665$; $P<0.05$) implying that there was influence of ICT literacy on students' academic performance. The study concluded that ICT literacy significantly influences the academic performance of undergraduates at Taraba State University, Jalingo. Recommendations were made that lecturers should engage students in activities which require the use of ICT facilities for instructional delivery and that the ICT Directorate of the university should be actively involved in orientation exercises of matriculating students so as to acquaint them with the facilities at their disposal and how to put them to good use while on campus.

Keywords: Influence, ICT Literacy, academic performance, Undergraduate Students

Word Count: 300

Introduction

Instruction is often carried out at all levels of education with versatile tools and strategies aimed at improving the learning process and in line with global best practices. One of such practices is the incorporation of computers, audiovisual devices, projectors, and other technological gadgets, all of which fall loosely under the nomenclature of Information and Communication Technology (ICT). Scholars perceive the application and integration of these devices into classroom instruction and personal study by students divergently. While some are reluctant to incorporate ICT devices into their instructional processes, others embrace it from planning to evaluation of learning, and the gains of such approach have been extolled. Buabeng-Andoh (2012) argued that evidence abounds on the great capabilities of ICT in the spreading of knowledge, making education more real and the development of more efficient educational service. Several students and undergraduates are yet to realize the full potentialities of this broad field.

ICT has been a topic of discussion and research in the educational, political and government cycles as drivers for economic growth in both developed and developing countries. ICT has also been cited as a contributor to social and political transformation and an enabler of innovation (Spence & Smith, 2010). In recognition of this, the United Nations considers one of its Sustainable Development Goals (SDG) to "significantly increase access to information and communications technology and strive to provide universal and affordable access to the internet in Least Developed Countries (LDCs) by 2020" (Rouse, 2017). According to Okoro and Ekpo (2016), information and Communication Technologies (ICTs) are widely regarded as a modern education instrumental tool that allows educators to adjust the teaching methods they utilize to improve students' performance. When properly utilized in a guided manner, ICT opens the learner to all kinds of information and learning tools especially on the subject or topic of choice.

On the part of the students, ICT is very important as it enables them to associate contents and dissociate concrete, tangible facts from the abstract ones, to help promote the students' retention and to facilitate the simulation when actual practice is not yet feasible. Katz and Macklin (2006) clarified that technology is the portal through which people interact with information, handle information, solve problems and think critically about the future.

ICT literacy has been defined as the ability to use digital technology, communications tools, and/or networks to access, manage, integrate, evaluate and create information to function in a knowledge society (ISkills Assessment, 2007). Kumar and Murali (2013) adopted the Chartered Institute of Library and Information Professionals of UK definition, "Information literacy is knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner." Saade and Kira (2009) maintain that it is a set of skills needed to find, retrieve, analyze, and use information. Katz and Macklin (2006) further maintained that Information and Communications Technology (ICT) Literacy comprises a 21st-century form of literacy, in which researching and communicating information via digital environments are as important as reading and writing were in earlier centuries. A synthesis of the definitions reveals that the authors identified a nexus between cognitive proficiencies, technical proficiencies, and ICT

proficiencies as a necessary prerequisite thereby underscoring the relevance of ICT literacy acquisition among students.

The importance of ICT literacy acquisition has become as important as the ability to read and write on paper. ICT-literate students master content faster (Asian Development Bank, 2017), are better problem-solvers, become more self-directed, and assume greater control over learning (Latifah, Herlambang, & Wijoyo, 2021). These assertions may be considered true, because learners are able to gain knowledge, have more comprehension, application, can perform some analysis, synthesis and evaluation of content. A student who has been taught to engage all of these domains is better prepared to identify and respond to test items during measurement.

Regarding digital literacy and education, all educational systems emphasize the importance of computer literacy in the 21st century. ICT in education incorporates e-learning applications which are being created almost daily. Some of the available options include Ms Excel, PowerPoint, PDF reader; drawing apps which help students of engineering or geography to experiment without physical waste of materials; the list is practically endless. Sadly, the awareness seems to be quite low among undergraduate students in Nigeria including Taraba State University, Jalingo (Bailey, 2021).

To further entrench the ICT drive, educational policies were reviewed to allow for further modifications in the curriculum content. In Nigeria, Computer Science was introduced into the curriculum for primary and secondary schools as a way of ensuring that the projected computer literacy ratio of the society would be attained by a specified period. Even when some students possess mobile devices and smartphones with robust functionalities, they may still exhibit some deficiency in the technical manipulation of such gadgets. Cursory observation reveals that most undergraduate students at Taraba State University utilize their smartphones for social media activities more than they do for academic purposes. Bailey (2021) found from a National Youth Survey that only 45% of Nigerian youths have word processing skills, which could be the reason for the alarmingly high level of youth unemployment. Nwosu, Ogar and Danjuma (2021) lamented that employers of labour in some economic climes complain of graduates not having the 21st-century skills (ICT), which is fundamental to thrive in modern world of work is devastating. According to Shirzad and Shirzad (2017), those students who lack proficiency in computer skills often

might use most of their mental power and cognitive resources on working with the computer rather than focusing on what they are actually being tested on. This may lead to an inability to perform well on tests and consequently to low academic achievement.

The concept of academic performance has often been used interchangeably with academic achievement. Performance refers to the result of an examination in a subject or a whole course (Lamas, 2015). Academic performance, according to Obeka (2010), is the quality of results produced by students which reflects in the quality of their examination scores. Obeka, Bichi and Yusuf (2012) define academic performance as the display of knowledge attained or skill developed in school subjects designed by test and examination scores or marks assigned by subject teacher. This study views academic performance as a measure of how learners' progress periodically, as seen in their CGPA and also a measure of effort, investment, commitment and time.

Assessment at Taraba State University, as in most universities, includes the use of assignments or independent study questions, which usually require the use of the internet to gain access to online journals or e-learning materials as a means of getting updated content on the topic. The outcome of their academic performance as represented by the GPA or CGPA at the end of a semester, and session respectively, usually is a net sum or result of the assignment scores and the final semester examinations taken.

Most universities in Nigeria such as Taraba State University have commenced the use of Computer Based Test (CBT) as a platform for students' assessment and an alternative to the Paper and Pencil Test (PPT). Nyanganji and Awu (2018) stated that, a CBT center has been set up to position Taraba State University for the new trend of computer-based testing or examination such as the University's internally moderated GST examinations introduced during the 2016/2017 academic session. Likewise, Olumorin, Fakomogbon, Fasasi, Olawale and Olafare, (2013) asserted that the University of Ilorin, Federal University of Technology, Akure and Federal University of Technology, Minna are maximizing the use of CBT as a tool for undergraduate and postgraduate assessments.

Scholars have shown considerable evidence regarding the relationship between Information and Communication Technology and academic performance of learners in both negative and positive ways across diverse climes. Nwosu, Ogar and Danjuma (2021) conducted a

study to examine lecturers' perception of Information and Communication Technology (ICT) skills acquisition and graduate employability in Cross River State, Nigeria, and found that ICT skills acquisition significantly influenced graduates' employability. Oseghale and John (2014) studied the impact of computer literacy on students' academic performance in Esan West Local Government Area of Edo State, Nigeria and found that computer-literate students performed better than non-computer-literate ones. Likewise, John, Izang and Akorede (2015) studied Information and Communication Technology (ICT) Competence and Literacy among undergraduates as a factor for academic achievement in Tai Solarin University of Education (TASUED), Ijagun, and Babcock University, Ogun State, Nigeria and found that over 80% of the undergraduates in TASUED and BU are competent in the use of ICT and that, ICT competence and literacy improved the academic performance of students.

Statement of the Problem

Taraba State University's demographic distribution shows that a large percentage of the population are rural-urban migrants whose rural schools lack ICT facilities and adequate literacy and may therefore be bereft of ICT Literacy skills. Ultimately, disparity is likely to occur in students' academic performance between those who fully utilize the huge potential of ICT literacy and those students who possess limited or no literacy in ICT. In realization of this "digital divide", this study finds relevance to examine such phenomenon as it reflects on academic performance of undergraduate students because the entire education system today is ICT driven. Also, from reviewed literature, such a study has never been carried out in Jalingo Local Government Area and especially in the Taraba State University. Lack of literacy in ICT on the part of students may have effect on their performance. Thus, examination of Information and Communication Technology (ICT) literacy of Taraba State University undergraduate students and its influence on their academic performance becomes very paramount.

Aim and Objectives of the Study

The study investigated the Influence of ICT Literacy on undergraduate students' Academic performance in Taraba State University, Jalingo. Specifically, the study determined:

i. ICT literacy level of undergraduate students of Taraba State University, Jalingo.
ii. The difference between CGPA of ICT literate undergraduate and ICT non-literate undergraduate students in Taraba State University, Jalingo.

Research Questions

The following research questions guided this study:

i. What is the level of ICT literacy among the undergraduate students of Taraba State University, Jalingo?
ii. How does the CGPA of ICT literate undergraduate students differ from the CGPA of the ICT non-literate undergraduate students in Taraba State University, Jalingo?

Hypothesis

The following null hypothesis guided this study and was tested at a 0.05 level of significance:

$H0_1$: There is no significant difference between the mean CGPA of ICT Literate Students and the mean CGPA of students who lack ICT literacy.

Methodology

The study adopted descriptive survey research design. The population of the study was 16,652 comprising all the undergraduate students of Taraba State University, Jalingo (TSUJ Registry, 2023). A sample of 400 students was selected using Krejcie and Morgan (1970) table for sample size determination. The selection of respondents was carried out through multistage sampling procedure to select faculties, departments, programmes and human subjects. Immediately after their GST tests, the researcher administered the ICT literacy test instrument to 20 students from the selected departments. The instrument used to generate data for the study was an achievement test titled "ICT Literacy Achievement Test" (ICTLAT). The ICTLAT contained some items adapted from the existing instruments of John, Izang and Akorede (2017) and UNESCO's Survey Instrument for ICT Literacy (2010).

The first section of the instrument elicited demographic details from respondents and also about their CGPA. The researchers ensured anonymity and confidentiality since there was no column to supply registration numbers or names. The second section contained 15 questions used for determining ICT literacy of the respondents. The

questions covered computer applications, programmes and other peripherals. Kuder-Richardson formula 20 was used to determine reliability coefficient of 0.80 for the ICT literacy test. 0.80 is accepted as a good index for reliability of survey instruments (Ajai and Amuche, 2015). Data was analyzed using mean, and standard deviation to test the research questions while independent t-test statistics was used to test the null hypotheses at a 0.05 level of significance. For the research questions, a score below 7 (46.7%) was considered as low ICT literacy while for the hypotheses, if the t_{cal} is less than t_{tab}, the null hypothesis is retained, but if t_{cal} is greater than t_{tab}, the null hypothesis is rejected.

Results

The results were analyzed according to the research questions and hypotheses and presented as follows:

Research question One: What is the level of ICT literacy among the undergraduate students of Taraba State University, Jalingo?

Table 1: Showing Items Used to Determine ICT Literacy Level of Respondents

S/N	Item description
1	All of the following are examples of computer hardware device EXCEPT a. CPU b. Monitor c. Hard copy d. CD ROM Drive
2	One of these differentiates a laptop from a desktop computer a. One can use a mouse while the other cannot b. One is faster than the other c. A laptop can be carried around with ease d. Laptop can be used for browsing the internet while desktop cannot
3	A computer mouse is used for the following Except a. Clicking on images and icons on the computer b. Selecting text for copying c. Scanning an image into the computer d. Closing an active window
4	One of the following is associated with a scanner a. Image resolution b. Typing c. formatting d. USB connection
5	Sending a document from the computer to the printer requires a. A mouse and a printer b. only keyboard c. copying and pasting d. a keyboard, printer and paper
6	Microsoft Excel software is used for a. Only typing b. typing and calculations c. graphic design d. calculations only
7	Which of the following is NOT a means of connecting a computer to the internet? a. Modem b. Wi-Fi c. data connection speed d. cable
8	The following can be used for copying files to and from a computer EXCEPT a. A memory stick b. a diskette c. CDRW d. a data cable alone
9	The internet is a. A network that connects all networks b. A local area network c. A Global system of Mobile Telecommunications d. A general name for browsing information
10	The component of the computer where information is stored only when the computer is on is called…. (a. Hard disk (b. Random Access Memory (c. Motherboard (d. Flash Disk
11	A light pen is an example of a. Input device b. software device c. output device d. writing device
12	The correct procedure for shutting down a computer is a. Press the power button, close programmes b. Close active windows, click start menu, click shutdown e. Disconnect from the power socket, close programmes, press power button d. All of the above

13	Which of these operating softwares is designed for accessing the internet? a. Microsoft Word b. PowerPoint c. Mozilla Firefox Browser d. Windows 7
14	Which of the following is a type of printer? a. Thermal printer b. LaserJet Printer c. Dot Matrix Printer d. All of the Above
15	One of the following is a type of computer mouse a. Mechanical mouse b. Optical Mouse c. Wireless Mouse d. all of the above

The Analysis of respondents' scores in mean and standard deviations is shown below

Table 2: Mean and Standard Deviation Ratings Showing Level of ICT Literacy of Undergraduate Students of Taraba State University, Jalingo

	N	Min	Max	Sum	Mean	Std. Deviation
ICTLAT_Score	400	1.00	13.00	2227.00	5.57	2.565
Valid N (listwise)	400					

Source: *Researchers' Field Survey (2023).*

Table 2 above shows the mean score of 400 respondents on the ICTLAT administered to them. The mean score is 5.57, (SD= 2.565), which is below the cut-off point of 7 or 46.7%. This implies that, the overall ICT literacy level of undergraduate students of Taraba State University is low.

Research Question Two: What is the mean difference between the CGPA of ICT literate undergraduate students and the CGPA of the ICT non-literate undergraduate students?

Table 3: Mean and Standard Deviations Showing mean difference between ICT Literate group and Non-ICT Literate group.

	groups_ICT	N	Mean	Std. Deviation	Std. Error Mean	Mean difference
CGPA	ICT non-literate	104	2.44	.706	.0725	1.032
	ICT literate	296	3.47	.739	.0410	

Source: *Researchers Field Survey (2023)*

Table 3 above shows the mean CGPA of the two groups of respondents – ICT literate group have a mean CGPA of 3.47 (SD= .739) while the ICT non-literate group have a mean CGPA of 2.44 (SD= .706). The mean difference between the two groups is 1.032. There is a high mean difference between the CGPA of ICT literate and ICT non-literate undergraduate students in TSUJ.

Test of Hypothesis

Hypothesis 1: There is no significant difference between the mean CGPA of ICT Literate Students and the mean CGPA of students who lack ICT literacy.

Table 5: Independent t-test showing difference between the mean CGPA of ICT Literate Students and the mean CGPA of Non-ICT literate Students

		Independent Samples Test								
		Levene's Test		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Differ-ence	95% Confidence Interval of the Difference Lower	Upper
CGPA	Equal variances assumed	.003	.958	12.665	398	.000	1.03202	.08148	.87182	1.19221
	Equal variances not assumed			12.388	173.369	.000	1.03202	.08331	.86759	1.19645

Source: *Researchers Field Survey (2023)*

Table 5 above shows that the t_{cal} is 12.665, which is greater than the t_{tab}(3.323, df=398) at 0.05 level of significance. There is enough reason to reject null hypothesis. This implies that there is significant difference between the CGPA of ICT literate students and the CGPA of ICT non-literate students in Taraba State University, Jalingo.

Discussion of Findings

The findings of this study showed that the ICT literacy level of undergraduate students is lower than the acceptable average. The ICTLAT contained very basic topics on the use of ICT for daily task performance including educational purposes but only few respondents could score up to 60 percent. The finding supports Bailey (2021) who

found from a National Youth Survey that only 45% of Nigerian youths have Word Processing skills. The finding of this study is however incongruent with the findings of John, Izang and Akorede (2015) which found that over 80% of the undergraduates in Tai Solarin University of Education (TASUED), Ijagun, and Babcock University, Ogun State, Nigeria are competent in the use of ICT and are information literate. Demographic and sociocultural dynamics between the two populations may need to be studied further to establish a basis for such disparities in generalizability of findings.

The study further revealed a high and significant mean difference between the CGPA of ICT literate students and the ICT non-literate students in favour of the former. This finding agrees with Oseghale and John (2014) who found that computer literate students performed better than non-computer literate students in academics in Esan West Local Government Area, Edo State, Nigeria. The finding resonates with that of Nwosu, Ogar and Danjuma (2021) who found that ICT skills acquisition significantly influenced graduates' employability in Cross River State, Nigeria. Findings also agree with that of John, Izang and Akorede (2015) who established that ICT competence and Literacy improved the academic performance of students. A computer literate student is exposed to the opportunity of relating abstract concepts to concrete equivalents in the absence of the concrete ones. This increases their scope of interaction with instructional content when studying for examinations.

Conclusion

The study investigated influence of Information and Communication Technology (ICT) literacy on the academic performance of undergraduate students in Taraba State University, Jalingo, Nigeria. Based on the findings, the study conclude that ICT literacy significantly influence academic performance of undergraduates in Taraba State University, Jalingo. The fact that undergraduate students with high ICT literacy had a higher mean CGPA than students with low ICT literacy implies that ICT literacy is very important for the students to do well academically. These findings reveal real-life implications for curriculum review and implementation to actualize the ideals enshrined in the Nigerian National Policy on ICT.

Recommendations

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

i. Every programme coordinator in the university should actively inculcate the use of ICT for instructional purposes as this will encourage learners to engage ICT the more thereby increasing the students' ICT literacy. The students should be encouraged to utilize ICT for assignments and research as it has been found to boost retention and recall of content.
ii. The ICT Directorate of the University should be actively involved in the orientation exercises of matriculating students so as to acquaint them with the facilities at their disposal and how to put them to good use while on campus.

References

Ajai, J. T. & Amuche, C. I. (2015). *Educational research methods and statistics.* Abuja: Academic House Publishers.

Asian Development Bank (2017). *Innovative strategies for accelerated human resource development in South Asia. Information and Communication Technology for Education Special Focus on Bangladesh, Nepal, and Sri Lanka*. Philippines: ADB.

Bailey, B. (2021). Only 45% of Nigerian youths have word processing skills. Retrieved December 10, 2022 from: https://businessday.ng>News.

Buabeng-Andoh, C. (2012) An exploration of teachers' skills perceptions and practices of ICT in teaching and learning in the Ghanaian Second Cycle Schools. *Contemporary Educational Technology*, 3(1), 36-49.

ISkills Assessment (2007). *Digital transformation: A framework for ICT literacy*. A report of the International ICT Literacy Panel. Educational Testing Service: Princeton, New-Jersey.

John, H.C., Izang, A.A., & Akorede, O.J. (2015). *Information and Communication Technology (ICT) Competence and Literacy among Undergraduates as a factor for Academic Achievement*. Paper Presented at the 1st International Conference on Applied Information Technology 7-9 October, 2015.

Katz, I.R. & Macklin, A.S. (2006). Information and Communication Technology (ICT) literacy: Integration and assessment in higher education. *Systemics, Cybernetics and Informatics.* 5(4), 50-55.

Krejcie, R.V. & Morgan, D.W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610.

Kumar, T. K. and Murali, G. (2013). Information and communication technology literacy (ICTL): Skills for library professionals in the digital era. In *Information Management Today and Tomorrow: Festschrift in Honor of Prof. S. Sudarshan Rao* (353-366). BR Publishing Corporation.

Lamas, H. A. (2015). School performance. *Journal of Educational Psychology-Propositos y Representaciones*, 3(1), 351-385.

Latifah, L., Herlambang, A.D., & Wijoyo, S.H. (2021). Mastery of technological, pedagogical and content knowledge (TPACK) Prospective Teacher in ICT Expertise Brawijaya University. *Journal of Information Technology and Computer Science*, 6(3), 319-329.

Nwosu, P.O., Ogar, J.O., & Danjuma, J.S. (2021). Lecturers' perception of Information and Communication Technology (ICT) skills acquisition and graduates' employability in Cross Rivers State, Nigeria. *International Journal of Multidisciplinary Research and Analysis, 4*(11), 1588-1592.

Nyanganji, M., & Awu, C. O. (2018) Harnessing the full potential of ICT in Taraba State University: Progress and impediments. In Talla, N. S.; Akombo, E.T. and Atando, A. D. (Eds.), *Taraba State University at 10: History, developments, challenges and prospects* (pp. 367-377). Jalingo: TSU Press.

Obeka, S.S. (2010). Effect of inquiry and demonstration method on students' academic performance and retention in some environmental education concepts of Geography. *Journal of Studies in Science and Mathematics Education*, 1(1) 52-58.

Obeka, S.S., Bichi, S.S., & Yusuf, A. (2012). Effects of integrating instructional models with lecture method on academic performance of senior secondary school students of various class-sizes in environment concepts of Zaria Education Zone. *Journal of Educational Research and Development* 6(3), 68-79.

Okoro, C. O., & Ekpo, E. E. (2016). Effects of Information and Communication Technology (ICT) application on academic achievement of students in Christian Religious Studies in Cross River State. *International Journal of Interdisciplinary Research Method.* 3(2), 14-24.

Olumorin, O. C., Fakomogbon, A. M., Fasasi, A. Y., Olawale, O. C. & Olafare, O. F. (2013), "Computer based tests: A system of assessing academic performance in university of Ilorin, Nigeria. *American Academic & Scholarly Research Journal* 5(2).

Oseghale, A.J., & John, O. (2014) The Impact of computer literacy on students' academic performance in senior secondary schools in Esan West Local Government Area, Edo State, Nigeria. *Journal of Education and Human Development*, 3, 265-270.

Rouse, M. (2017). ICT (information and communications technology, or technologies). from https://searchcio.techtarget.com/definition/ICT-information-and-communications-technology-or-technologies.

Saade, R., & Kira, D. (2009). Computer anxiety in e-learning: The effect of computer self-efficacy. *Journal of Information Technology Education,* 8, 177–191.

Shirzad, M., & Shirzad, H. (2017). The effect of computer literacy on the participant's writing ability in TOEFL Ibt. *Theory and Practice in Language Studies 7*(2),

Spence, R., & Smith, M. (2010). *A dialogue on ICT, human development, growth and poverty reduction: A background paper.* The Harvard Forum. Berkman Center for Internet & Society at Harvard University and Canada's International Development Research Centre.

UNESCO, Bangkok (2010). *ICT Transforming Education: A Regional Guide.* Thailand: Asia and Pacific Regional Bureau for Education.