



PROBLEMS AND PROSPECTS OF INTEGRATING ICT IN TERTIARY EDUCATION IN KADUNA STATE, NIGERIA

^{*1}Shafi'u NUHU, ²Wada HUDU, ¹Asma'u Dalhatu ALHASSAN

¹Department of Curriculum and instructional, Federal University of Education, Zaria, Nigeria

²Department of Educational Technology, Federal University of Education, Zaria, Nigeria

*Corresponding Author: shafiunuhu123@gmail.com; 07036937609

Abstract

This paper examined, Problems and Prospects of Integrating ICT in Tertiary Education in Kaduna state, Nigeria. The study was guided by two objectives; to examine electricity supply in the integration of ICT and examine the availability of ICT facilities among tertiary institutions in Kaduna state. Research questions and hypotheses were in line with objectives of the study. The study adopted descriptive research survey. The population of the study was 3520, comprises of 2120 300L students of Faculty Education, ABU, Zaria, and 1400 Year Three (NCE III), College of Education, Zaria. While a sample size of 346 was used in the study. Simple random techniques was used in selecting the respondents, while purposive sampling techniques was used in selecting the two institutions. Frequency and percentage count was used to analyse the bio data of the respondents, mean and standard deviation was used to respond to the research questions raised in the study, while Chi-Square was used to test the two hypotheses raised in the study. Finding shows that, there is significant difference of electricity supply in the integration of ICT (p-value of $0.002 < \alpha 0.05$). There is adequate availability of ICT facilities among tertiary institutions in Kaduna state, Nigeria (p-value of $0.004 < \alpha 0.05$). The study concluded, there is adequate supply of electricity in the schools, electrical fittings in the schools are well maintained, alternative electricity source is well maintained and there is provision for lighting points in an appropriate location and recommendations were made; Government at all level as well as private business owners should recognize the used to adequately equip higher institutions with adequate electricity supply in order to enhance the use and integration of ICT in schools.

Keywords: Problems, Prospects, Integrating ICT, Higher Institutions

Introduction

The effects of ICT have often regarded as a positive change, and as if there is change there is always an improvement. However, 'change' and 'improvement' are not synonyms, and the changes, when using ICT, are not merely beneficial or expected; similarly as Rogers (1995) depicts unexpected consequences of innovations. In this study, the theme was investigated by using different points of view of the main actors in tertiary institution, i.e. lecturers and students. In addition, various research methods were applied based on how well they met the research topic and objects dissemination of technology.

The significance of education in the growth of every country cannot be underestimated. Tertiary education especially universities have over the years become the core of every economy's growth. However, people have become disturbed about the falling standards of tertiary education in the country. One of the contributing factors is poor teaching. Teaching is core the success of education and the role of information and communications technology in adding teaching in the tertiary education is very significant.

There has always been debate among educators on how the technology should be used and what improvements in teaching could be expected. Initially microchip or integrated circuit (IC) computers were used to teach programming but the development of the microprocessor in the early 1970s saw the introduction of affordable microcomputers into tertiary institutions at a rapid rate. Computers and applications of technology become more pervasive in society which led to a concern about the need for computing skills in everyday life.

Tertiary education broadly refers to all post-secondary education, including but not limited to universities. Universities are clearly a key part of all tertiary systems, but the diverse and growing set of public and private tertiary institutions in every country colleges, technical training institutes, community colleges, nursing schools, research laboratories, centres of excellence, distance learning centres, and many more forms a network of institutions that support the production of the higher-order capacity necessary for development.

ICT provides opportunities for teachers and students to operate, store, manipulate, and retrieve information, encourage independent and active learning, and self-responsibility for learning, motivate teachers and students to continue learning even outside school hours, plan and prepare lessons, design materials and facilitate sharing of resources, expertise and advice. ICT as a versatile instrument has the capability not only of engaging students in instructional activities to increase their learning, but of helping them to solve complex problems to enhance their cognitive skills.

In fact, innovative use of ICT can facilitate student centered learning, Hence, every classroom teacher should use learning technologies to enhance their student learning in every subject because it can engage the thinking, decision making, problem solving and reasoning behaviours of students. These are cognitive behaviours that students need to learn in an information age. Although ICT may facilitate independent self-paced learning, the potential of ICT may not be optimized if there is no shift in the learning and teaching paradigm. In fact, teachers play an important role in the teaching-learning paradigm shift. They must understand the potential role of technology in education. Also, they should become effective agents to be able to make use of technology in the classroom.

Due to ICT's importance in society and possibly for the future of education, identifying the possible obstacles to the use of ICT in educational institutions would be an important step in improving the quality of teaching and learning in the education system of Nigeria. Aleksander (2012) argue that although educators appear to acknowledge the value of ICT in institutions, difficulties continue to exist during the processes of adopting these technologies. This study therefore aimed to bring together the findings and the key points from a review of a significant part of the available literature associated with difficulties that teachers are facing in using ICT in teaching-learning process. Identifying the fundamental problems may assist teachers and educators to overcome these problems and become successful technology adopters.

ICT plays various roles in learning and teaching processes. According to Barker (2014), several studies have reviewed literature on ICT and learning and have concluded that it has great potential to enhance student achievement and teacher learning. Aremu (2014) point out that technology can play apart in supporting face-to-face teaching and learning in the classroom. Many researchers and theorists assert that the use of computers can help students to become knowledgeable, reduce the amount of direct instruction given to them, and give teachers an opportunity to help those students with particular needs. It can help the teachers enhance their pedagogical practice and equip them with the knowledge and skills to use different computer technologies to access, analyse, interpret process and disseminate information to learners. It can also help the educational institutions to provide ICT capacity (resources) to ensure that all teachers and students have immediate access to all software that are required to support the curriculum and adequate support to implement its use in classroom teaching-learning process without any difficulties. Furthermore, it can also help to enhance the quality of education by increasing learner motivation and engagement.

Statement of the Problem

There have been a number of problems impeding the wholesale uptake of ICT in education across all sectors. These have included such problems as a lack of funding to support the purchase of the technological gadgets, a lack of training among established teaching practitioners, a lack of motivation and need among teachers to adopt ICT as teaching tools (Flieshman, 2011).

The material conditions may be the insufficient number of computers and copies of software. The non-material obstacles include teachers' insufficient ICT knowledge and skills, the difficulty of integrating the use of ICT in instruction, and insufficient teacher time. Another perspective presents the obstacles in the use of in educational institutions as pertaining to material and non-material conditions. The material conditions may be the insufficient number of computers and copies of software. The non-material obstacles include teachers' insufficient ICT knowledge and skills, the difficulty of integrating the use of ICT in instruction, and insufficient teacher time.

Inadequate electricity supply as well as unavailability of ICT facilities such as computer, projectors, software, problem of sufficient training to ICT personnel are indeed constraining the integrating of ICT in high institution, how then can teachers sufficiently use ICT in teaching, research and delivery of knowledge. Inadequate equipment and tools can hamper the integration of ICT, problem of skilful personnel, teachers' reluctance to the new

knowledge, lack of confidence, one of the issues that could prevent the integration of ICT in tertiary institutions, problem of confidence in the life of lecturers as well as lack of knowledge in integrating ICT into pedagogical practices. Time limitation is also a problem affecting the integration of ICT into educational learning and teaching. Many lecturers have skills in using computer in the classroom but still do not use this technology because of lack of time sufficient lecturers' identity, lack of time as the reason why they do not use computer and other ICT facilities. The focuses of this paper therefore was to problems and prospects of Integrating ICT in Tertiary Education in Kaduna State.

Objectives of the Study

The study was guided by two objectives:

1. to examine electricity supply in the integration of ICT in tertiary institutions in Kaduna state, Nigeria; and
2. examine the availability of ICT facilities among tertiary institutions in Kaduna state, Nigeria.

Research Questions

The study raised two research questions:

1. What is the level of electricity supply in the integration of ICT in tertiary institutions in Kaduna state, Nigeria? and
2. What is the availability of ICT facilities among tertiary institutions in Kaduna state, Nigeria?

Hypotheses

Two hypotheses were formulated:

1. There is no significant different in the opinion of respondents on electricity supply in the integration of ICT in tertiary institutions in Kaduna state, Nigeria; and
2. There is no significant different in the opinion of respondents on the availability of ICT facilities among tertiary institutions in Kaduna state, Nigeria.

Literature Review

The greatest impact is found in relation to lecturers who are experienced users and who from the start had already come far with the integration of ICT in their teaching. Lecturers who perceive a highly positive impact of ICT use ICT in the most project-oriented, collaborative and experimental way (Ramboll Management, 2006). With ICT, the lecturer tends to become more of an advisor, critical dialogue partner and leader for specific subject domains (ITU, 2004).

The impact of ICT is highly dependent on how it is used. The impact of a specific ICT application or device depends on the capacity of the lecturer to exploit it efficiently for pedagogical purposes. Factors beyond the lecturer's control influence ICT uptake, e.g. institutional cultures, leadership, the curriculum and assessment (Ramboll Management, 2005 and 2006.). Lecturers do not yet exploit the creative potential of ICT and engage students more actively in the production of knowledge. Lecturers' use of ICT for communication with and between students is still in its infancy. ICT is not fully utilized to create learning environments where students are more actively engaged in the creation of knowledge rather than just being passive consumers. The researcher also found more transformative use of ICT where it was used within a curriculum context, more "built in" than "bolt on". Here again simple distinction between "built in" or "bolt on" does not tell the whole story.

Another way in which emerging ICTs are impacting on the content of education curricula stems from the ways in which ICTs are dominating so much of contemporary life and work. Already there has emerged a need for educational institutions to ensure that graduates are able to display appropriate levels of information literacy, "the capacity to identify and issue and then to identify, locate and evaluate relevant information in order to engage with it or to solve a problem arising from it" (McCausland, Wachc & Berk, 1992). The drive to promote such developments stems from general moves among institutions to ensure their graduates demonstrate not only skills and knowledge in their subject domains but also general attributes and generic skills. Traditionally generic skills have involved such capabilities as ability to reason formally, to solve problems, to communicate effectively, to be able to negotiate outcomes, to manage time, project management, and collaboration and teamwork skills. The growing use of ICTs as tools of everyday life have seen the pool of generic skills expanded in recent years to include information literacy and it is highly probable that future developments and technology applications will see this set of skills growing even more.

Just as technology is influencing and supporting what is being learned in schools and universities, so too is it supporting changes to the way students are learning. Moves from content-centred curricula to competency-based curricula are associated with moves away from teacher-centred forms of delivery to student-centred forms. Through technology-facilitated approaches, Contemporary learning settings now encourage students to take responsibility for their own learning. In the past students have become very comfortable to learning through transmissive modes. Students have been trained to let others present to them the information that forms the curriculum. The growing use of ICT as an instructional medium is changing and will likely continue to change many of the strategies employed by both teachers and students in the learning process. The following sections describe particular forms of learning that are gaining prominence in universities and schools worldwide.

The use of ICT in educational settings, by itself acts as a catalyst for change in this domain. ICTs by their very nature are tools that encourage and support independent learning. Students using ICTs for learning purposes become immersed in the process of learning and as more and more students use computers as information sources and cognitive tools (eg. Reeves & Jonassen, 1996), the influence of the technology on supporting how students learn will continue to increase.

Generally, three objectives are distinguished for the use of ICT in education: (a) the use of ICT as object of study; refers to learning about ICT, which enables students to use ICT in their daily lives; (b) the use of ICT as aspect of discipline or profession; refers to the development of ICT skills for professional or vocational purposes; (c) the use of ICT as medium for teaching and learning; focuses on the use of ICT for the enhancement of the teaching and learning process. It is a fact that teachers are at the centre of curriculum change and they control the teaching and learning process. Therefore, they must be able to prepare young people for the knowledge society in which the competency of using ICT to acquire and process information is very important. ICT plays various roles in learning and teaching processes teaching and learning in the classroom.

According to Ibrahim (2011), technology integration is meant to be cross-curricular rather than become a separate course or topic in itself. Technology should be used as a tool to support educational objectives such as skills for searching and assessing information, cooperation, communication and problem solving which are important for preparation of students for the knowledge society.

The study adopted the theory of constructivism

The emergence of ICTs as learning technologies has coincided with a growing awareness and recognition of alternative theories for learning. The theories of learning that hold the greatest sway today are those based on constructivist principles (eg. Duffy & Cunningham, 1996). These principles posit that learning is achieved by the active construction of knowledge supported by various perspectives within meaningful contexts. In constructivist theories, social interactions are seen to play a critical role in the processes of learning and cognition (eg. Vygotsky, 1978).

In the past, the conventional process of teaching has revolved around teachers planning and leading students through a series of instructional sequences to achieve a desired learning outcome. Typically these forms of teaching have revolved around the planned transmission of a body of knowledge followed by some forms of interaction with the content as a means to consolidate the knowledge acquisition. Contemporary learning theory is based on the notion that learning is an active process of constructing knowledge rather than acquiring knowledge and that instruction is the process by which this knowledge construction is supported rather than a process of knowledge transmission (Duffy & Cunningham, 1996).

The strengths of constructivism lie in its emphasis on learning as a process of personal understanding and the development of meaning in ways which are active and interpretative. In this domain learning is viewed as the construction of meaning rather than as the memorisation of facts (eg. Lebow, 1993; Jonassen & Reeves, 1996). Learning approaches using contemporary ICTs provide many opportunities for constructivist learning through their provision and support for resource-based, student centered settings and by enabling learning to be related to context and to practice (eg. Berge, 1998; Barren, 1998). As mentioned previously, any use of ICT in learning settings can act to support various aspects of knowledge construction and as more and more students employ ICTs in their learning processes, the more pronounced the impact of this will become.

Methodology

The study adopted descriptive survey, the choice of the design was based on the premise that the study involved collecting of data from a high population (Akorede et al., 2022) involving three hundred level students of Faculty of Education, Ahmadu Bello University, Zaria and Part three NCE III students FCE, Congo, Zaria. The study population was 3520, comprises of 2120 three hundred level students of Faculty Education, Ahmadu Bello University, Zaria, and 1400 part three NCE, College of Education, Zaria. The total sample size of the study was 346, this sample size was drawn, based on the recommendations Sambo (2008) representing 10% of the study population simple random was used to select the social studies students.

The instrument used in the study for collection of data was a modified instrument titled Problems and Prospect of Integrating ICT in Higher Institution (PPIICTHI). The researcher adopted a modified Licker scale questionnaire of Strongly Agree (SA), Agree (A) Disagree (D) and Strongly Disagree (SD). The rating was: SA = 4, A = 3, D = 2, SD = 1. The questionnaire was divided into two sections, A B, and C, Section A looks at the bio-data of the respondents while section B and C had a total of 20 test items that investigated the variables of the paper. The instrument was validated by experts from Instructional Technology Section of the Department, in the Department of Educational Foundation and Curriculum, Test Measurement and Evaluation all in the Faculty of Education, Ahmadu Bello University Zaria validated the instrument in order gets face and contents of the instrument. The pilot tested instrument was subjected to statistical analysis using cronbach alpha, it was tested at 0.05 significant level, the result obtained was 0.78 which was closed to 1, which actually shows that, the instrument under consideration was reliable enough to measured what it was supposed to measured.

Direct administration and collection of the instrument was personally done by the researcher with help of 1 research assistant, the instrument were distributed and collected as soon as they were filed and ticked. Two statistical tools were employed in the conduct of data analysis descriptive statistics in form of frequency. Percentage court was used. Mean and standard deviation was used to answer the research questions raised in the study, chi-square was used to test the null hypotheses, all were test at 0.05 alpha level of significance.

Results

Research Question 1: What is the level of electricity supply in the integration of ICT in tertiary institutions in Kaduna State, Nigeria.

To answer this research question, the data gathered were analysed using frequency counts, mean and standard deviation. The summary of the analysis is presented in Table 1.

Table 1: Summary of Descriptive analysis posed to determine the level of electricity supply in the integration of ICT in tertiary institutions in Kaduna state, Nigeria.

S/N	Item Statement	SA	A	D	SD	Mean	STD
1	There is adequate supply of electricity in the schools.	87	51	84	84	3.56	1.16
2	All the electrical fittings in the schools are well maintained.	107	33	84	82	2.23	1.25
3	The alternative electricity source is well maintained.	88	86	48	84	2.83	1.20
4	There is provision for lighting points in an appropriate location.	84	44	83	95	2.36	1.25
5	There is functional alternative source of power supply.	103	97	58	66	2.84	1.11
6	There is provision of light in all the classes.	96	67	106	33	2.38	1.16
7	The electrical connections are well fitted.	92	75	80	69	2.50	1.10
8	Generators are provided.	85	74	86	61	2.87	1.12
9	Electrical pump and lightening are well positioned.	87	83	79	57	3.92	1.10
10	Electricity are provided in libraries and lecture theatres.	40	10	118	138	1.69	1.01
Cumulative mean score						2.71	1.14

Table 1 shows the descriptive analysis carried out on to determine the level of electricity supply in the integration of ICT in tertiary institutions in Kaduna state, Nigeria. The table above shows the cumulative mean score of 2.71 which is greater than the decision mean of 2.5. It also shows the standard deviation of 1.14, which implies that the level of electricity supply in the integration of ICT in tertiary institutions are significant. Item 1 and 9 on the

table recorded the highest response mean from all the respondents. This denotes that there is constant electricity supply in the integration of ICT in tertiary institutions in Kaduna state, Nigeria.

Research Question Two: What is the availability of ICT facilities among tertiary institutions in Kaduna state, Nigeria. To answer this research question, the data gathered were analysed using frequency counts, mean and standard deviation. The summary of the analysis is presented in Table 2.

Table 2: Summary of Descriptive analysis on the availability of ICT facilities among tertiary institutions in Kaduna state, Nigeria.

S/N	Item Statement	SA	A	D	SD	Mean	STD
1	Radio cassette recorders are available.	88	29	102	87	2.48	1.15
2	Video cameras are available.	127	49	23	107	2.65	1.36
3	Learning management system are available.	50	31	103	122	1.91	1.01
4	Website interactive tools are available.	152	54	54	46	3.08	1.08
5	Intranet are available.	130	73	58	45	2.99	1.09
6	Grade records software are available.	112	93	75	26	2.98	.981
7	Television/video conferencing are available.	121	48	92	45	2.85	1.14
8	Internet/web environment are available.	57	49	133	67	3.07	1.06
9	Multimedia computers are available.	139	67	53	47	2.96	1.14
10	Projectors are available.	70	35	105	96	2.26	1.21
Cumulative mean score						2.72	1.12

Table 2 shows the descriptive analysis carried out on the availability of ICT facilities among tertiary institutions in Kaduna state, Nigeria. The table shows the cumulative mean of 2.72 which is greater than the decision mean of 2.5. It also shows the standard deviation of 1.12, which implies that, there is availability of ICT facilities among tertiary institutions in Kaduna state. Item 4 and 8 on the table recorded the highest response mean from all the respondents. This denotes there is adequate availability of ICT facilities among tertiary institutions in Kaduna state, Nigeria.

Hypotheses Testing

This section tested the hypotheses in order to have valid decision for the hypotheses stated in the study. The non-parametric statistical tool of chi-square (χ^2) was used to test the hypotheses at 0.05% level of significance. The summary of each of the hypotheses is presented as follows:

Hypothesis One: There is no significant different in the opinion of respondents on electricity supply in the integration of ICT in tertiary institutions in Kaduna state, Nigeria.

The data collected from teachers and students were summarized using tally system based on each school. The summarized data were tested using non-parametric statistical tool of chi-square (χ^2) at 0.05% level of significance. The summary of the hypothesis tested is presented in Table 3:

Table 3: Summary of Chi-square (χ^2) statistics on electricity supply in the integration of ICT in tertiary institutions in Kaduna state, Nigeria

N	χ^2 cal.	χ^2 crit.	df	α	Sig.	Decision
306	84.93	56.22	56	0.05	.002	Rejected

Table 3 shows that the calculated p-value of 0.002 is less than 0.05 level of significance, while the χ^2 calculated value of 84.93 is higher than the χ^2 critical value of 56.22. Consequently, the hypothesis which stated that there is no significant difference of electricity supply in the integration of ICT in tertiary institutions in Kaduna state, Nigeria was rejected. The result is therefore revealed that, there is significant difference of electricity supply in the integration of ICT in tertiary institutions in Kaduna state, Nigeria.

Hypothesis Two: There is no significant different in the opinion of respondents on the availability of ICT facilities among tertiary institutions in Kaduna state, Nigeria.

The data collected and summarized using tally system based on each school. The summarized data was tested using non-parametric statistical tool of chi-square (χ^2) at 0.05% level of significance. The summary of the hypothesis tested is presented in Table 4:

Table 4: Summary of Chi-square (χ^2) statistics on the availability of ICT facilities among tertiary institutions in Kaduna state, Nigeria

N	χ^2 cal.	χ^2 crit.	Df	α	Sig.	Decision
306	110.16	85.21	56	0.05	.004	Rejected

Table 4 shows that the calculated p-value of 0.004 is less than 0.05 level of significance, while the χ^2 calculated value of 110.16 is higher than the χ^2 critical value of 85.21. Consequently, the hypothesis which stated that there is no significant different in the opinion of respondents on the availability of ICT facilities among tertiary institutions in Kaduna state, Nigeria. was rejected. The implication of this result is that, there is adequate availability of ICT facilities among tertiary institutions in Kaduna state, Nigeria.

Conclusions and Recommendations

The study concluded: There is adequate supply of electricity in the schools, electrical fittings in the schools are well maintained, alternative electricity source is well maintained and there is provision for lighting points in an appropriate location. There is functional alternative source of power supply and provision of light in all the classes are adequately provided. The study recommended that:

1. Government at all level as well as private business owners should recognize the used to adequately equip higher institutions with adequate electricity supply in order to enhance the use and integration of ICT in schools.
2. Government, School Administrators should recognize the need to adequately provide higher institution with current and appropriate modern ICT facilities to enhance teaching and learning in higher institution.

References

- Akorede, S. N., Akorede, A. A., Isiaq, A. T., & Yusuf I. S. (2022). Influence of demographic characteristics on family planning adoption among females in Samaru, Kaduna State. *Kampala International University Interdisciplinary Journal of Social Science and Humanities*, 3(1), 1-12. <http://dx.doi.org/10.59568/KIJHUS-2022-3-1-01>
- Aleksander, A. (2012). *The impact of information communication and technology on education performance and its efficiency in selecting EU and OECD countries: A non-parametric analysis* (MPRA Paper No. 39805). MPRA.
- Alex, C. (2012). *Instructional media in the language classroom*. <http://editionenglishclub.com/left.articles/gender/cl>
- Anaeto, S., & Anaeto, M. (2010). *Development communication: Principles and practice*. Stirling-Horden Publishers.
- Aremu, M. A. (2014). Impacts of the use of ICT in English language pedagogy on Nigerian national development. *International Journal of English Language and Linguistics Research*, 2(1), 56–58.
- Asemah, E. S. (2011). *Principles and practice of mass communication*. University Press.
- Bangkok, A., Blamire, R., & Kefala, S. (2006). *A review of studies of ICT impact on schools in Europe*. European Schoolnet. http://ee.europe.eu/education/pdf/doc254_en.pdf
- Barker, C. (2014). *Blended learning: Teacher plus computer equals success*. Desert News.
- Drent, M., & Meelissen, M. (2007). Which factors obstruct or stimulate teacher educators to use ICT innovatively? *Computers & Education*, 51(1), 187–199.
- Drent, M. (2005). *In transitie: Op weg naar innovatief ICT-gebruik op de PABO [In transition: On the road to innovative use of ICT in teacher education]* (Doctoral dissertation, University of Twente). University of Twente.

- Federal Ministry of Education. (2010). *Rapid improvement followed by strong performance in strong performers and successful reformers in education: Lessons from PISA for the United States*.
- Flichsman, G. (2011). *Using the personal hotspot on your Verizon phone*. Macworld. <http://www.macworld.com/article/158058/2011/02/personalhotspotverizon.html>
- Hassan, S. (2013). *Mass communication: Principles and concepts*. CBS Publishers & Distributors Pvt. Ltd.
- Ibrahim, U. K. (2011). *Influence of instructional materials on the academic performance of students in agricultural science in secondary schools in Kwara State, Nigeria* (Unpublished master's thesis). Ahmadu Bello University.
- Kofi, A. N., & Quaye, F. (2015). The impact of ICT on teaching and learning in tertiary institutions: A case study of Wisconsin International University College, Ghana. *Journal of Information Engineering and Applications*, 5(5).
- Okobiah, O. S. (2010). *The nature and elements of national development and integration in Nigeria*. Enugu Publishers.
- Timinepre, C. C. (2013). *Effect of computer-aided instructional package on social studies students' achievement in Katagum Educational Zone, Bauchi State, Nigeria*.