



ICT Literacy and Usage for Quality Education in Public Tertiary Institutions in Anambra State, Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Author OFO designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors OKP and OFO managed the analyses of the study and literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

The study investigated the extent of ICT literacy and usage for quality education in tertiary institutions in Anambra State. Two research questions and two hypotheses guided the study. Descriptive survey research design was adopted. The population of the study comprised 905 lecturers from 5 public tertiary institutions in Anambra State, while 200 lecturers representing 110 females and 90 males (22%) were drawn as the sample size using simple random technique. The instrument for data collection was a 23 item questionnaire validated by three experts, one from Educational Management and Policy Department and one expert from Measurement and Evaluation Unit in Educational Foundations Department, Nnamdi Azikiwe University, Awka. Reliability of the instrument was determined using Cronbach Alpha which yielded co-efficient value of 0.78. Data obtained were analyzed through mean and t-test statistic at 0.05 level of significance. The findings indicate that lecturers in Anambra State public tertiary institutions have low extent of ICT literacy for they still operate on the emerging stage but their usage of some basic ICT device like phones and browsers was relatively high. Lack of training on ICT, inadequate ICT facilities and government support/provisions militate against ICT literacy and usage by lecturers in tertiary institutions. Gender has no significant effect on the extent of ICT literacy and usage by tertiary

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institution lecturers for quality education. Based on the findings, the study recommended inter alia that, ICT training and re-training of lecturers should be upheld by the administrators of tertiary institutions while government's adequate provisions for ICT facilities is an imperative, to enhance lecturers productivity and efficiency.

Keywords: Information communication technology; literacy; usage; quality education; tertiary institution.

1. INTRODUCTION

Education in a technological driven society is navigated with ICT literacy and usage for social transformation and national development. Accordingly, education remains a veritable tool upon which the development of any nation rests. Little wonder developed societies are evidently leading in the profiles of educational investment.

Consequently, the philosophy of Nigeria Education as enshrined in the National Policy on Education [1] encapsulates that,

Education shall continue to be highly rated in the National development plan because education is the most important instrument of change in the intellectual and social outlook of any society that has to be preceded by an educational revolution.

By dint of the above assertion, the premium placed on education as the pivot of any national development is truism. However, the researchers are not oblivious of the fact that any nation's education system is majorly affected by the quality of its teachers. In effect, FRN, [1] asserts that "since education system may not rise above the quality of its teachers, teacher education shall continue to be given major emphasis in all education planning and development." It was on this premise that Akudolu, [2] advocates that modern societies are increasingly based on information and knowledge, teachers in institutions of learning should be equipped with Information and Communication Technology (ICT), knowledge and skills to handle information and adopt a problem solving approach in order to generate knowledge in learning. Hence, ICT plays a considerable role if quality education is desired.

Considering the import of ICT, Nigerian government on its part enacted a policy on computer education to improve the quality of her education system in 1988. The policy was geared towards the recognition of the role of ICT in improving quality education in the country [3].

Information and Communication Technology globally recognized as an inter-connectivity of different types of computer networks linked together is defined by Anderson and Glen, [4], as those technologies that are used to access, gather, manipulate and present or communicate information. They include hardware such as computer and other devices, software applications, connectivity and video conferencing. ICT entails collating, analyzing, processing, manipulating, storing, retrieving, transmitting and communicating of data in different forms that may include audiovisual, audio and visual formats. Broadly speaking, ICT encompasses technologies such as radio, television, video, DVD, telephone (land lines and mobile phones), satellite systems, computers, hardware and software network as well as the equipment associated with these technologies like video conferencing, e-mail and logs [5]. In a similar development, World Bank,[6] conceptualized ICT as consisting of hardware, software, networks and media for collecting, storage, processing, transmitting and presenting of information, voice data, text and images. It is a new development with tremendous potentials on tertiary education and business education.

Asides the foregoing, ICT is fast becoming indispensable in virtually all aspects of human life; hence its impact in the education sector has been enormous. Furthermore, the advancement of world technology via education indicates the import of ICT in education especially in the 21st century. Therefore, ICT is an indispensable part of the contemporary world of education. Hence, Ofojebe, Olibie and Chukwuma, [7] opine that, "... it is necessary that everyone be acquainted with ICT."

Acquaintance of ICT by everyone involves lecturers' literacy and usage of ICT in tertiary institutions in Anambra State. This aids effective and efficient pedagogy, administration and communication geared towards quality education. In enhancing quality education, tertiary institution lecturers are expected to imbibe ICT which is seen as the fastest means of

communication aided in tertiary institutions by electronic mails, social media, telephone calls, internet and others. Consequently, Anene, Ikerionwu and Danladi, [8] opined that teachers in university use most simple ICT facilities such as phones for communication and to browse information for writing, updating knowledge and information. The burning issue is to ascertain the extent of lecturers' literacy and usage of ICT in tertiary institutions in order to enhance quality education.

In the context of this study, ICT literacy implies the ability to access, manipulate, have knowledge to exchange information and communicate, create, collect, collaborate, store, and retrieve the information garnered in ICT technology. Also, ICT literacy is the ability to use tools of information communication technology to organize and synthesize one's information with best ICT tools available in order to use it effectively and responsibly [9].

By implication, when these are applied, the aspect of ICT usage is implied. Therefore, ICT usage entails everyday usage of digital technology which includes when you use a computer, tablet or mobile phone, send email, browse the internet, and make a video call, using ICT skills and technology to communicate [10].

There is no gainsaying that the advancement in ICT literacy and usage in tertiary institutions in Anambra State, Nigeria would go a long way to enhance quality education of the learners. In effect, quality education is one that is pedagogically and developmentally sound and educates the student in becoming an active and productive member of the society, not education merely measured by test scores or how many words per minute a 5-year-old child can read. Moreover, to hark back to these simplified measurements is to do a disservice to both the student and the phrase Quality Education itself [11].

Corroborating Slade's view was the Association for Supervision and Curriculum Development (ASCD's) statement and Education International (EI) definition of quality education thus:

A quality education is one which focuses on the whole child – the social, emotional, mental, physical and cognitive development of each student regardless of gender, race, ethnicity, socioeconomic status or geographic location it prepares the child for life, not just for testing.

In addition, Slade opined that there are some who argue that quality education is met by focusing only on literacy and numeracy. Education is meant for all children to reach their full potential and be productive in society. This was in line with the 2012 UN Secretary General, Ban Ki-moon's [12], assertion that, "schools must improve so that students are prepared to be productive citizens, ready to lead the future".

Sequel to the above, school improvement geared towards having productive citizens' demands investigating the extent of lecturers ICT literacy and usage in public tertiary institutions in Anambra State for quality education. The 21st century tertiary education system has taken advantage of technological exploits to improve quality education. However, Onasanya, [13] opined that most tertiary institutions lecturers in Nigeria lack adequate pedagogical knowledge for effective utilization of ICT resources for teaching.

Going by Onasanya's stance, there appears to be a gap regarding ICT literacy and usage during teaching and learning processes depicting incompetence on the part of some lecturers in Anambra State tertiary institutions. Hence, Bolaji, [14] and Kelly, [15] stated that ICT application in tertiary institutions fall below expectation. Okwudishu, [16], collaborated this view when he noted that, non-availability of some ICT resources in schools hamper education utilization of ICT resources in tertiary institutions. It is uninteresting and common observing some tertiary institution lecturers adopting analogue teaching method which may result to disservice to the students. In the light of the foregoing, Kpai, Joe-Kinane and Ekeleme, [17] opined that in Nigeria University of Education student teachers are not equipped with ICT skill while in university. Corroborating the view, Mba, [18] noted that some teachers in Anambra State are not ICT literate due to the fact that they were not trained with ICT in school. Training of teachers is done across board irrespective of gender affiliation; therefore, gender of lecturers may not determine the extent of their ICT literacy and usage in tertiary institutions in Anambra State. This may contradict the views of O' Donnell and Sweetman, [19], that, "a gender gap exists in access to ICTs, but far greater divides exist in relation to the create and control content".

In view of the foregoing, the study was designed to investigate whether lecturers gender affiliation affect extent of their ICT literacy and usage in

tertiary institutions in Anambra State Nigeria. The outcome of this investigation will enhance the optimal benefit of ICT literacy and usage for teaching and learning. Against this backdrop, the researchers were spurred to investigate the extent of ICT literacy and usage in public tertiary institutions in Anambra State, Nigeria.

1.1 Statement of the Problem

Observation through repeated visitations to some public tertiary institutions in Anambra state appears that, the traditional lecture method and use of textbooks still engross classroom instructions and are upheld as the common practice. This depicts the level of literacy and usage of ICT by some lecturers in some tertiary institutions, the benefits of ICT notwithstanding. However, in a technological driven environment yearning for global connect, tertiary institutions like the ones in Anambra State, Nigeria should engaged in pragmatic effort to improve teaching and learning. This calls for the adoption of information and communication technology literacy and usage in various tertiary institutions. Notably, ICT is an invaluable intervention geared towards qualitative education in modern times.

In view of the foregoing, ICT has been widely accepted as the key that unlocks the fruitfulness of modern teaching, learning and research endeavours by male and female lecturers across Anambra State tertiary institutions. Hence, World Bank, [6] recommended electronic networking of institutions involving e-mails, communication capacity for teaching, research, management and performance monitoring of systems. Lucidly, the recommendations of the World Bank appeared to be beautiful blueprints that are lacking in concrete practical terms in tertiary institutional framework. Till date, irrespective of gender differences, some lecturers seem to lack the requisite knowledge and adequate usage of ICT which go a long way to incapacitate their productivity, hence depriving students of quality educational outcome. Some lecturers cannot engage their students in effective on-line conferencing, test and research. Therefore, they experience total disadvantage in harnessing the myriad benefits associated with ICT literacy and usage. In pursuit of quality education for all, the need for ICT literacy and usage by both male and female lecturers should be at the front burner in all tertiary institutions.

In the light of the above problem, the study was poised to investigate the extent of ICT literacy and usage for quality education in public tertiary institutions in Anambra State.

1.2 Research Question

The following research questions guided the study:

1. What is the extent of ICT literacy for lecturers in tertiary institutions in Anambra State?
2. What is the extent of ICT usage in teaching of courses by lecturers in tertiary institutions in Anambra State?

1.3 Hypotheses

Ho1 There is no significant difference between male and female lecturers ICT usage in teaching of courses in tertiary institutions in Anambra State.

Ho 2 There is no significant difference between male and female lecturers ICT literacy for proficiency during lectures in tertiary institutions in Anambra State.

2. METHODS

Descriptive survey design was adopted for the study. The extent of ICT literacy and usage for quality education in public tertiary institutions in Anambra State, Nigeria was sought. Two research questions and two hypotheses guided the study. The population of the study comprised 905 lecturers from 5 public tertiary institutions in Anambra State, while 200 lecturers representing 110 females and 90 males (22%) were drawn as the sample size using simple random technique. The researchers developed 23 item questionnaire was used for data collection. Three experts validated the instrument, one from Measurement and Evaluation unit of Educational Foundations department and two experts from Educational Management and Policy department, all in Nnamdi Azikiwe University, Awka. Reliability was determined using Cronbach Alpha which yielded a co-efficient value of 0.78. Data were analyzed using mean and the hypothesis tested using t-test statistic at 0.05 level of significance.

Decision rule set at a mean cut off point of 2.50 and above was regarded as high extent while 2.49 and below was an indication of low extent of ICT literacy and usage by lecturers.

3. RESULTS

Research Question 1: What is the extent of ICT literacy for lecturers in tertiary institutions in Anambra State?

Table 1 reveals that lecturers are ICT complaint in 3 out of the 10 items listed. Many lecturers have low extent ICT literacy in items 1,2,3,4,5,7 and 10 with mean scores of 1.9,2.3, 2.4,2.3,2.0,2.4 and 2.0 respectively. These are below 2.5 which is the accepted mean score. However, items 6, 8 and 9 are above 2.5 which depict the areas lecturers have high extent of ICT literacy.

Research Question 2: What is the extent of ICT usage in teaching of courses by lecturers in tertiary institutions in Anambra State?

Table 2 shows that the mean for items 12, 13, 17, 18, 22 and 23 are below 2.5 and therefore lecturers ICT usage is of low extent while items 11, 14, 15, 16, 19, 20 and 21 are above 2.5 indicating high extent of ICT usage by lecturers.

Ho1: There is no significant difference in the male and female lecturers ICT usage in teaching of courses in tertiary institutions in Anambra State.

From the result presented in Table 3, the calculated t-value at 188 degree of freedom and 0.05 level of significance is 0.2356. Since the calculated t-value is less than the critical table value of 1.96, the null hypothesis is accepted. This is an indication that male and female lecturers do not differ significantly in their ICT usage in teaching of courses in public tertiary institutions in Anambra State, Nigeria.

Ho 2: There is no significant difference between male and female lecturers ICT literacy for proficiency during lectures in tertiary institutions in Anambra State.

Table 4 reveals that the calculated t-value at 188 degree of freedom and 0.05 level of significance is 0.4052. Since the calculated t-value is less than the critical table value of 1.96, the null hypothesis is accepted. This depicts that gender of the lecturers do not differ significantly in their ICT literacy for proficient lectures in Anambra State tertiary institutions.

Table 1. Mean ratings of the responses on the extent of lecturers ICT literacy in tertiary institutions in Anambra State

S/No	Items	F	VHE	HE	LE	VLE	\bar{X}	Remark
1	I was trained as a student teacher with ICT	200	15	30	81	74	1.9	LE
2	I have undergone computer training with ICT facilities before I was employed.	200	35	55	45	65	2.3	LE
3	I have received in-service training on ICT after being employed.	200	40	50	65	45	2.4	LE
4	I trained myself on ICT after being employed.	200	40	54	32	74	2.3	LE
5	Partaking in online discussion room (i.e Skype, Imo, etc)	200	25	30	65	80	2.0	LE
6	I can engage students in virtual classroom	200	92	78	11	19	3.2	HE
7	Ensuring that teachers/students undertake courses on internet	200	40	56	50	54	2.4	LE
8	Monitoring daily routine and classroom instruction with close circuit television	200	106	54	0	40	3.1	HE
9	My phone has internet access, video and camera devices and I can operate very well.	200	56	60	40	44	2.6	HE
10	Ensuring that both tutorial and administrative members of staff can operate a desktop/laptop	200	28	36	60	86	2.0	LE

Table 2. Mean ratings of responses on the extent of lecturers ICT usage in tertiary institutions in Anambra State

S/No	Items	F	VHE	HE	LE	VLE	\bar{X}	Remark
11	I can comfortably operate ICT facilities such as computers.	200	60	80	38	22	2.9	HE
12	I can use ICT facilities such as television, camera, projector and materials in teaching.	200	25	28	68	79	2.0	LE
13	I can type material with computer.	200	36	36	60	68	2.2	LE
14	I can browse with ICT facilities such as computer and phones	200	63	65	38	34	2.8	HE
15	Sending e-mails to teachers	200	51	48	52	49	2.5	HE
16	Using projectors for meetings and classroom instruction.	200	54	43	47	56	2.5	HE
17	Using smart board for classroom instruction.	200	40	48	54	58	2.4	LE
18	I can use spread sheets package to compute students' result.	200	34	46	70	50	2.3	LE
19	Ensuring that both tutorial and administrative staff can use spread sheet in result computation.	200	54	74	42	30	2.8	HE
20	I ensure that all departments use photocopying machine/printer and scanner	200	36	40	60	64	2.2	LE
21	Lecturers use search engine like Google and Firefox to browse information.	200	58	62	43	37	2.7	HE
22	Lecturers use micro soft excel package and Corel draw.	200	48	32	70	50	2.4	LE
23	I can use software for statistical analysis of my research data	200	62	28	42	68	2.4	LE

Table 3. T-test difference in mean ratings of male and female lecturers ICT usage in teaching in tertiary institutions

Variables	N	\bar{X}	SD	DF	Sig level	T-cal	T-crit	Decision
Male lecturers	90	2.51	0.2749	188	0.05	0.2356	1.96	Not significant
Female lecturers	110	2.43	0.2754					

P>0.05, DF 188

Table 4. T-test difference in mean ratings of male and female lecturers ICT literacy for proficient lectures in tertiary institutions

Variables	N	\bar{X}	SD	DF	Sig level	T-cal	T-crit	Decision
Male lecturers	90	1.90	0.5711	188	0.05	0.4052	1.96	Not significant
Female lecturers	110	2.42	0.3630					

4. DISCUSSION

Findings on Table 1 show that lecturers in some tertiary institutions in the study area have low extent of ICT literacy because they were not trained, equipped as ICT teachers, hence were not fully ICT complaint in many areas. This is in

line with Kpai, Joe-Kinanee and Ekeleme, [17] who opined that in Nigeria University of Education student teachers are not equipped with ICT skill while in the university. Concurring with the view, Mba, [18] noted that some teachers in Anambra State are not ICT literate due to the fact that they were not trained with ICT

while in school. Items 2-4 indicate that some lecturers did not receive ICT training before they were employed and equally were not trained after being employed. Some lecturers' usage of spread sheet package for result computation, usage of projectors, laptops in classroom interaction were to a low extent. The low extent of ICT literacy is exemplified in the traditional teaching/lecturing method used in many classrooms by lecturers in public tertiary institutions. Some still glue their eyes to textbooks, dictation of notes and others, irrespective of whether white board; projectors are mounted in the classrooms. Moreover, some lecturers can use their Microsoft excel package, coral draw, software for statistical analysis of their research to a low extent. This points to inadequate productivity since tertiary institutions in Nigeria depend on publish or perish syndrome.

In another development, the researchers are not oblivious of dearth of ICT infrastructural facilities in some public tertiary institutions which pose major challenge to lecturers ICT literacy and usage during lecture delivery. In addition, lecturers' limited exposure to ICT facilities poses some challenges to their ICT literacy and usage in service delivery in tertiary institutions. This affirmed the findings of Ololube, Ubogu and Egbezor, [20] that ICT infrastructures and facilities are not available for instructional delivery in Nigerian tertiary institutions. Facing the challenges of quality education delivery in tertiary institutions in Anambra State, Nigeria, lecturers must embrace ICT usage during teaching and learning. Hence, effective ICT usage should be sustained through efficient usage of computer hardware, software and other ICT accessories by lecturers of tertiary institutions. Similarly, the finding corroborated the views of Onasanya, [13] that most tertiary institution lecturers in Nigeria lack adequate pedagogical knowledge for effective utilization of ICT resources for teaching.

In spite of that, the findings reveal that lecturers can browse the internet and download some materials using the android phones; some can engage their computer for online conferencing with students and colleagues. This is in accord with the views of Anene, Ikerionwu and Danladi, [8] who posited that teachers in university use most simple ICT facilities like phones for communication and to browse information for writing, updating knowledge and information. However, lecturers do not maximally use ICT facilities in teaching. They still need to integrate ICT facilities like camera, projector, television

and power point to enhance teaching and learning. Some lecturers are still at the lowest level of pedagogy integration with ICT as recommended by UNESCO which is at the front burner regarding quality education. These lecturers are still at the emerging stage of ICT literacy and usage. It is after the emerging stage that they move to applying stage, then infusing stage and finally to transforming stage. By this analogy, public tertiary institution lecturers' low extent in ICT literacy and usage for effective teaching and learning clearly impede quality education.

The finding from hypothesis one indicates that gender has no significant effect on the extent of ICT usage of public tertiary institution lecturers because at the tertiary level of training, both male and female lecturers are exposed to the same platform, gender differences notwithstanding. This implies that irrespective of gender affiliation the extent of lecturers ICT usage are the same. Therefore, the responses of male and female lecturers ICT usage are the same.

The indication that there is no significant difference between the mean ratings of the opinions of respondents on the extent of lecturers ICT usage in tertiary institutions in Anambra State unearth lecturers inadequate service delivery of quality education due to dearth of ICT facilities, epileptic power supply, lack of commensurate ICT training at school and inadequate exposure to be ICT complaint for lecturers. This scenario defies gender barrier, for all the public tertiary institutions in Anambra State, Nigeria operated on co-educational platform, whereby ICT facilities are not segregated based on gender. Hence, the academic attainment of the lecturers at the training stage does not differ significantly. In effect low extent of male and female lecturers ICT literacy and usage drastically impinge quality education delivery in tertiary institutions.

Null hypothesis in Table 4 indicated that there is no significant difference between male and female lecturers ICT literacy for proficiency during lectures in tertiary institutions in Anambra State. This contradicts the views of Tomte, [21] who noted that, the overall picture of the situation relating to gender and information and Communication Technology (ICT) has so far been that men have been dominating the field and have left the women behind. But, her study found that this male domination of the entire ICT field is not the case anymore.

5. CONCLUSION

Lecturers of Anambra State public tertiary institutions ICT literacy is to a low extent, but their use of basic ICT devices like phones, browsers is relatively high. However, there are still challenges impeding lecturers' attainment of ICT literacy and usage of ICT devices during teaching and learning in various tertiary institutions like dearth of ICT infrastructural facilities. The challenge hinders lecturers ICT literacy and usage thereby impinging the delivery of quality education in tertiary institutions.

In other development, finding of the study reveal that to a high extent lecturers in Anambra State tertiary institutions can browse the internet, download some documents with their phones, computers and others. However, they do not maximize usage of ICT facilities in teaching their courses. There is no significant difference in the mean rating of male and female lecturers ICT usage and literacy in public tertiary institutions in Anambra State.

6. RECOMMENDATIONS

The following recommendations were made base on the findings of the study as follows:

1. The need for intensive ICT training and re-training to reposition lecturers for maximum literacy and usage of computers facilities for teaching and learning is imperative.
2. Technical support from the tertiary institutions' management in collaboration with the government to equip lecturers in ICT literacy and usage must be enhanced.
3. Government should enhance the provision of ICT facilities in order to avail both male and female lecturers in tertiary institutions productivity and efficiency in quality education service delivery.
4. Annual evaluation of male and female lecturers ICT literacy and usage should be adopted by tertiary institutions administration.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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