An Analysis on the Application of Information and Communication Technology (ICT) in Teaching Health Education Students in Tertiary Institutions of Adamawa State, Nigeria

Mohammed Adamu, Danjuma M. Baba, Nuhu I. Musa, Ibrahim Goni*,
Usman Mohammed & Wamanyi Yohanna

*Department of Health Education and Promotion, Department of Environmental Health, Department of General Studies, Adamawa State College of Health Technology Mubi, Nigeria. Email: algonis1414@gmail.com**

ABSTRACT

The paper sought to analyse the application of Information and Communication Technology (ICT) in teaching Health Education students in tertiary institutions in Adamawa State. A survey research design was used for the study. The population for the study comprised of 4 tertiary institutions offering Health Education out of which 2 were sampled. A simple random sampling was used in selecting 150 students from each of the institutions sampled making a total of 300 respondents. Data was collected with the use of questionnaire which was subjected to validity and reliability test. The mean and ANOVA was used in establishing the correlation between the variables in the study. The researcher accepts a result if the average mean is above 2.6 which is on the high side and shows a significant relationship. The researchers also reject a result if the average mean is below 2.5 which is on the low side and shows no significant relationship. Based on the findings of this study, it is recommended that: institutions and their management should have more ICT training centers on campus, the management of the institutions should urgently make sure ICT facilities are available for students' use, the students should be given assignments, course project, group work, which will involve sourcing for information from the internet, lecturers should encourage students to organize mini seminars for presentation of assignments through the use of power point among others.

Keywords: Information, Communication, Technology, Application, Health, Education.

1. Introduction

The presence of Information and communication technology (ICT) can increasingly make teaching and learning quite easy. It can assist in making lecturers work very easy and students having access to information to boost their knowledge. Information and Communication Technology if properly maximized in academic front will greatly improve teaching and learning, as well as produce an employable workforce for the country. Following the current trend in the world; illiteracy is not just about one's inability to read and write, but also includes one's inability to use the computer. Hence, a study that was carried out some years ago proved that technology improves literacy, gives students access to information, enhances learning and build students' self-esteem (O'hara; Pritcharch & Bacon 2014, West, 2012). It is clear that technology helps students build and diversify their personal knowledge (Wikipedia, 2009).

The introduction of ICT into tertiary institutions clearly changed the way education is conducted; it paves the way for a new pedagogical approach, where students are expected to play more active role than before (i.e. getting more involved in the teaching and learning process, being active participants of knowledge creation not mere recipients of knowledge) using information and know ICT tools in education, students should be able to communicate, create preservatives in power point, and interact with colleagues and teachers using technology. According to Yusuf (2005), 'Culture and society which are major factors of education, have adjusted to meet prevalence and rapid development in ICT has transformed human society from information age to the knowledge age. The use of ICT in education by staff and students is becoming a necessity as it can be used to improve the quality of teaching and learning in any tertiary institution.

Oduma (2013) likened ICT to a utility like water and electricity which plays a major role in education and has impacted on the quality and quantity of teaching and learning as well as research in educational methodology to initiate a new age in education. Internet as a digital tool of ICT has strengthen teaching and learning as it provides powerful resources and services for students, thereby enabling them meet their educational needs, it also allows for networking among students and teachers to facilitate exchange of ideas and improve opportunities for connecting schools to the world as learning is expanding beyond the classroom, so real life context can be established (Dotimi and Hamilton – Ekeke, 2013).

Nigeria as a country is yet to make available and use ICTs to transform its educational system. Olulube (2008) indicated the benefits of internet use in education, and also found positive and moderately high achievement at all educational level, from compute use in school subjects, which allows students to focus on strategies and interpretation of answers rather than spend time on tedious computational calculation. It is then generally believed that the use of internet in the educational sector in a developing nation like Nigeria would help bridge the information barrier between developed and developing nations.

Information and Communication Technology performs the function of storing, retrieving and processing, transferring and receiving information (Ajisufe, 2014). Technology includes the use of internet, projector and Computer in information dissemination. Information and Communication Technology (ICT) has changed many aspects of the way people manage information and communication. If one is to compare such field as medicine, tourism, business, law, banking, engineering and architecture with ICT, the roles of Information and Communication Technology during the past two or three decades have been enormous. The way these fields operate before is different from the way they operate at present.

The use of Information and communication technology in classroom allows schools to expand their marketers, respond to the business and environment requirements, support cross cultural and cross functional teams of students to engage and work together and allows faster and more practical cooperation between lecturers from various nations while maintaining the targeted level of quality delivery of knowledge in education. The use of Information and Communication Technology in teaching Health Education can allow more time and space flexibility for both lecturers and students to use the Health Education instructional materials. It can also allow for continuous testing of students on the contents of such materials, and allow the students more freedom in taking initiatives, learn or their own, be more creative, and individual study at their own space. However, Thierer (2000) pointed out that the role of technology in teaching and learning is rapidly becoming one of the most important and widely discussed issues in contemporary educational policy. Experts in the fields of education have agreed that, if ICT is properly used, it holds great promise to improve teaching and learning in addition to shaping workforce opportunities.

Aishah and Zeema Salim (2017), pointed out that ICT improves the quality and the quantity of education and causes better innovative, creative and cognitive thinking, higher productivity, efficiency, and positive educational outcomes. The application of ICT in teaching Health Education will prove beneficial in improving tertiary education system and gives students a better education. Moreover in schools where new technologies are used,

students have access to tools that adjust to their attention span and provide valuable and immediate feedback for literacy enhancement which is currently not fully implemented in the tertiary education system. The ability to use computers effectively has become an essential part of everyone's education. Skills such as book keeping, clerical and administrative work, stock taking, and so forth, now constitute a set of computerized practices that form the core IT skills packages; spreadsheets, word processors, and database (Effel and Whitworth, 2010). The demand for ICT literacy is increasing in Nigeria because employees realize that Computer and other ICT facilities can enhance efficiency. On the other hand, employees have also realised that Computers can be a threat to their jobs, and the only way to enhance job security is to become Computer literate. With the high demand for Computer literacy, the teaching and learning of these skills is a concern among professionals. This is also true of other ICT components.

Improved education is essential to the creation of effective human capital in any country. The application of ICT in higher institutions of learning cannot be overemphasized. In this technology-driven age, everyone requires ICT competence to survive. Organisations are finding it very necessary to train and retrain their employees to establish or increase their knowledge of Computers and other ICT facilities and these calls for early acquisition of ICT skills by students.

Considering the fast development of ICT, Mathipa and Mukhari (2014) were certain that many educational institutions would be formalizing the integration of ICT in teaching and learning. This is particular important for remote or physically challenged students who intend to access formal education with ease. Thus, schools should no longer continue to only be viewed as venues where knowledge is transmitted from the teachers to learners by using textbooks as the only source of information. Consequently, teachers are encouraged to integrate ICT into teaching. As the use of ICT is increasing in all sectors, Ghavifekr, Kunjappan, Ramasamy & Anthony (2016) believe that its use in education has the potential to transform teaching for the desired results.

The current trends in education require a paradigm shift from the mere supply of ICT in Education into a comprehensive use or application of ICT in education. However, the perceptions teachers hold towards the use of ICT in teaching and learning are the key determining factors to the success or failure of the use of ICT in Education (Apeanti, 2014). Khokhar and Javaid (2016) opine that teachers should have access to ICT devices, such as desktop PCs, laptops, tablets, ipads, and internet-enabled Smart phones. The usuage of these devices has quite similarities such as enhancement of communication with colleagues, information search and preparation of assigned tasks and lesson.

Silviyanti and Yusuf (2015) noted that teachers with e-readiness can use and adopt technologies into their classrooms when perceive that technology can be a useful tool in delivering quality lessons in a learner centered learning environment. Teachers can also use Twitter for educational purposes. Twitter can be used in the classroom to help engage students and teachers in the teaching and learning processes. Twitter as a media can serve as a back channel for teachers after a lesson to share resources, extend the class discussion, promote brainstorming, and to indorse students a sense of community (Wright & Forbes, 2016). Heemskerk, Brink, Volman and Ten Dam (2005) noted that ICT applications are not only substituting the existing teaching and learning tools, but teachers also use ICT to promote a new kind of learning in which they support and teach their students effectively.

Gebremedhin and Fenta (2015) opines that ICT when used in the teaching of Health Education increases the quality of productiveness in teaching as lecturers will be more efficient in their delivery of lectures.

Education is one of the most important needs for the wellbeing of individual and that of the society. Thus, education is a powerful instrument of social, political, and economic progress, without which neither an individual nor a society can attain professional growth. However, Health Education is the act of giving simple, accurate and scientific facts in a way they are to be understood, believed, accepted and practiced. Or the process of conveying to an individual or the community, knowledge that is necessary for the prevention of disease and the opportunity to have a full normal life, that is; physically, socially and mentally.

Information and Communication Technology (ICT) roles as instructional resources for teaching of Health Education in Adamawa State tertiary institutions is a noticeable improvement among the institutions and academic output. It is noted that the use of ICT equipment in teaching of Health Education in these institutions does not only assist the lecturers in carrying out their responsibilities effectively but also render qualitative services to the entire academic community. However, in Adamawa State tertiary institutions, these advantages are hindered by the presence of several challenges that arise from the use of various Information and Communication Technologies, including the need for expensive infrastructure and large startup costs, finding qualified instructors, and the lack of face to face instruction which may diminish the students interpersonal, social and communication skills. The purpose of this study is to examine the application of Information and Communication Technology (ICT) in teaching Health Education students in tertiary institutions in Adamawa State. To achieve this purpose, the following specific objectives are drawn:

i) *to determine the extent to which Health Education students make use of ICT facility in tertiary institutions in Adamawa State;*

ii) *to find out the commonly ICT facilities used in teaching Health Education students in tertiary institutions;*

iii) *to identify the challenges faced when using ICT facilities in teaching Health Education students in tertiary institutions and*

iv) *to proffer solutions to the challenges identified.*

This study will shed light on the application of Information and Communication Technology in teaching Health Education students in tertiary institutions in Adamawa State, the findings of this study will help to enhance students' academic achievement, it will also provide support for customized educational programme to meet the needs of individual learners, it will develop the lecturers' ability to reason properly, to solve problems, to communicate effective and to manage time. However, this study will help in changing the institutions administration in many ways, lecturers are expected to know how to use word processors and have their tests done in a proper format as well as record grades and attendance electronically. The researchers and educational planners in the areas of Health Education will find it useful in their research. It will help the governments, Ministry of Education, students and readers to understand those ICT benefits which were neglected in the past. Finally, the

study will create an avenue for more academic research which will benefit the society in terms of producing competent Health Educators.

2. Research Questions

For the purpose of this study, the following research questions are formulated.

i) *To what extent do Health Education students make use of ICT facilities in tertiary institutions in Adamawa State?*

ii) *What are the commonly ICT facilities used in teaching Health Education students in tertiary institutions?*

iii) *What are the challenges faced when using ICT facilities in teaching Health Education students in tertiary institutions?*

iv) *What are the solutions to the challenges identified?*

3. Method

The research design adopted for this study was the survey design. Survey design is appropriate for this work because the opinions of Health Education students are required to if ICT has significant effect on the effective teaching of Health Education in tertiary institutions. The researchers went to some selected institutions to collect data for the study.

3.1 Population and Sample

The population of the study comprised of all tertiary institutions in Adamawa State that are offering Health Education. Two institutions were selected and sued for the study. A simple random sampling technique was used in selecting 150 Health Education students from each of the 2 institutions that were selected. A total of 300 respondents were sampled. The method used for data collection was through questionnaire. A 30 items questionnaire was designed by the researchers which was completed by the respondents. And to ensure instrument validity, experts in ICT field validated the instrument. The data collected was arranged with 4 points modified Likert type scale which response categories were given as follows: Strongly Agreed (SA) 4 points, Agreed (A) 3 points, Disagreed (D) 2 points, and Strongly Disagreed (SD) 1 point. The data collected for this study was analysed using the mean statistical tool.

4. Results and Discussion

4.1 Research Question 1: To what extent do Health Education students make use of ICT facilities in the tertiary institutions?

S/No.	Statements	SA 4	A 3	D 2	SA 1	N	$\sum fx$	x
1.	Lecturers attend computer training classes.	137	118	30	15	300	977	**3.2**
2.	Students attend computer training classes.	122	108	40	30	300	922	**3.1**

3.	Students access internet in search of information.	103	120	50	27	300	899	**3.0**
4.	Students use e-mails for submission of assignments.	87	65	80	68	300	771	**2.6**
5.	Students make use of flash drive as supplementary learning material.	98	80	65	57	300	819	**2.7**
6.	Students have access to school internet only during school registration.	65	80	68	87	300	723	**2.4**
7.	**Students make use of computers for C.A. test.**	**106**	**98**	**60**	**36**	**300**	**874**	2.9

Average Mean = 2.8

All the statements raised had a high mean score of not less than 2.4. This is a clear indication that all the respondents were in agreement that lecturers make use of electronic board for lectures, students attend computer training classes, students access internet in search of information, students make use of computers for C.A. test among others. This is further strengthened by the Average mean score of 2.8.

4.2 Research Question 2: What are the commonly ICT facilities used in tertiary institutions?

S/No.	Statements	SA 4	A 3	D 2	SA 1	N	$\sum fx$	x
1.	There is a computer training center in the campus.	99	88	65	38	300	838	**2.8**
2.	Computers and printers are made available in the institutions.	118	120	40	22	300	934	**3.1**
3.	There is internet connectivity in the institutions.	128	136	28	8	300	984	**3.3**
4.	Students are using power point for slide show.	108	120	49	23	300	913	**3.0**
5.	Electronic board facilities are made available for teaching and learning.	100	96	73	31	300	865	**2.9**
6.	**Students use smart phones and other hand held devices to access information.**	**120**	**108**	**40**	**32**	**300**	**916**	3.0

Average Mean = 3.0

From the table above, it is evident that computer center, computers and printers, internet, power points, electronic boards, smart phones and other hand held devices among others are the commonly used ICT facilities in the tertiary institutions. It is deduced from the average mean of 3.0, which is on the high side. This collaborates with the views of Mathipa and Mukhari (2014) that they were certain that many educational institutions would be formalizing the integration of ICT in teaching and learning.

4.3 Research Question 3: What are the challenges faced when using ICT facilities in teaching?

S/No.	Statements	SA 4	A 3	D 2	SA 1	N	$\sum fx$	x
1.	Lack of access to the internet.	110	103	50	37	300	886	2.9
2.	Lack of proper maintenance of computer system.	120	135	25	20	300	955	3.2
3.	The required software are not available.	126	108	40	26	300	934	3.1
4.	Lack of computer technologist	109	120	38	33	300	905	3.0
5.	Inadequate power supply.	122	138	28	12	300	970	3.2
6.	Some teachers are not interested in using ICT facilities when teaching.	139	106	40	14	300	970	3.2

Average Mean = 3.1

The table above shows an average mean of 3.1. This is an indication that inadequate power supply, some teacher not interested in using ICT facilities during teaching, lack of required software, inadequate computer technologist, lack of proper maintenance of computer systems among others are the challenges faced when using ICT facilities in teaching. Based on the findings of this table, some teachers are not interested in using ICT facilities during teaching. This contradict with (Apeanti, 2014) opinion, that the perceptions teachers hold towards the use of ICT in teaching and learning are the key determining factors to the success or failure of the use of ICT in education.

4.4 Research Question 4: What are the possible solutions to the challenges?

S/No.	Statements	SA 4	A 3	D 2	SA 1	N	$\sum fx$	x
1.	Institutions should make provision for constant power supply.	148	112	22	18	300	990	**3.3**
2.	There should be proper maintenance of computer systems.	130	141	18	11	300	990	**3.3**

3.	Needed software should be made available.	152	130	14	4	300	1,030	**3.4**
4.	Access to internet facilities should be made available.	160	138	2	0	300	1,058	**3.5**
5.	The service of computer technologist should be employed.	127	140	20	13	300	981	**3.3**
6.	**Teachers should imbibe the culture of using ICT facilities when teaching.**	**146**	**131**	**16**	**7**	**300**	**1,016**	3.4

Average Mean = 3.4

From the table above, it is evident that the provision of internet facilities, provision of needed software, employment of computer technologist, teachers participation in the use of ICT during teaching, provision of constant power supply, maintenance of computer system among others are possible solutions to the challenges. This is deduced from the average mean of 3.4, which is on the high side.

5. Conclusion

Despite the glaring fact that ICT is regarded as the world's most influential instrument for the development of quality teaching, learning, and research in the educational system around the world, ICT have not been adequately integrated in the teaching of Health Education in Adamawa State tertiary institutions, even with its monumental revolution in the education industry. This is a result of the unavailability, acceptability and as well the infrequent usage of ICT facilities within the institutions under study.

The findings of this study indicates that the students from these tertiary institutions do not benefit fully from the educational revolution derived from the frequent use of ICT and as well the impact cannot be felt on teaching and learning experiences of the students.

6. Recommendations

Based on the findings from the study, the researchers therefore recommended that:

1) Institutions and their management should have more ICT training centers on campus or involve ICT in their curriculum to enable students the opportunity to be computer literates, so they can accept and use ICT in their everyday studies.

2) *The management of the institutions should urgently make sure ICT facilities are available for students use.*

3) The students should be given assignments, course projects, group work, which will involve sourcing for information from the internet as this will not only expose the students to the use of ICT but will also encourage them to be conversant with the facilities and maximize its potentials.

4) *Lecturers should encourage students to organise mini seminars for presentation of assignment through the use of power point, as this will acquaint them to tap the potentials derived from it.*

5) Institutions should organise ICT training programmes for students, to expose them to the available ICT facilities and enable them have easy use at their own convenience and time.

6) *Institutions should have an organized ICT center, with WiFi for free and easy internet connectivity, an organized e-mail transfer system between management, staff and students, to enable easy transfer of messages between students and staff.*

7) Institution should encourage students to conduct school registrations through the use of ICT facilities in order to maximize the usage.

8) *Institutions should mandate all students to create e-mail address and students related information should be on the institutions' website, for students to log on the institutions portal for information, thereby making them more conversant with these facilities.*

9) Institutions should ensure that lecturers in Health Education departments are well trained on how to make use of ICT facilities in their lectures.

10) *Parents should encourage their students by purchasing a computer system for them to enable them meet the present educational trend.*

11) The Government and Ministry of Education should implement policies on ICT usage in tertiary institutions, so as to adopt ICT use in teaching and learning.

References

Aishah, S. & Zeema, S. (2017). The ICT facilities, Skills, Usage, and the Problems faced by the Students of Higher Education, the EURASIA Journal of Mathematics Science and Technology Education 13(8): 4987 – 4994.

Ajisufe, O.E. (2014). Fostering Utilization of Information and Communication Technology Skills among Students of Business Education. Proc. of the 22nd Conf. of the Association of Business Educators of Nigeria (pp. 171 – 174).

Apeanti, W. (2014). Prospective Mathematics Teachers' Perception about ICT integration in Mathematics Instruction in Ghana. Global Educational Research Journal, 2(10), 174 – 184.

Dotimi, D.A. & Hamilton – Ekeke, J.T. (2013). Information and Communication Technology (ICT) – E – Learning in Nigerian Tertiary Institutions, the Librarian and Information Manager 6(1): 44 – 59.

Gebremedhin, M.A., Fenta, A.A. (2015). Assessing Teacher's Perception on Integrating ICT in Teaching-Learning Process: The Case of Adwa College. Journal of Education and Practice, 6(4) 114 – 124.

Ghavifekr, S., Kunjappan, T., Ramasamy, L. & Anthony, A. (2016). Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions. Malaysian Online Journal of Education Technology, 4(2), 38 – 57.

Heemskerk, I., Brink, A. Volman, M., & Ten Dam, G. (2005). Inclusiveness and ICT in education; a Focus on Gender, Ethnicity and Social Class. Journal of Computer Assisted Learning, 21(1), 1 – 16.

Khokhar, A. J., & Javaid, S. (2016). Students and Teachers Perceptions of ICT Use in Classroom. Pakistani Classrooms.

O'Hara, S. Pritchard, R., & Bacon, P. (2014). Teaching Vocabulary with Hypermedia. Retrieved, Feb. 18, 2020.

Oduma, J. (2013). Teacher Education and Information Communication Technology, in Nwaham, C.O. Moemeke, C.D. & Onyeagwu, F.O. (Eds) In Search of Excellence in Teacher Education in the 21st Century, Agor: Cee Emmy Lyke Venture.

Ololube, N.P. (2008). Computer Communication and ICT attitude and anxiety Among Higher Education Students. In A. Cartelli, (Ed). Encyclopedia of Information and Communication Technology, Pp. 100 – 105. Hershey, PA: Idea Group Publication

Reffell, R., & Whitworth, O.G. (2010). Factors affecting the development of Information Infrastructure in Africa. Library High Tech News 24(2): 15-20.

Wright, N., & Forbes, D. (2016). Twitter in Education.

Yusuf, M.O. (2005). Information and Communication Technologies and Education: Analyzing the Nigerian National Policy for Information Technology. International Education Journal, 6(3), 316 – 321.