

The Influence of Information and Communication Technology (ICT) on Teacher Education and Professional Development in Delta State, Nigeria

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Abstract: This study was designed to investigate the Influence of Information and Communication Technology (ICT) on Teacher Training in Delta State, Nigeria. The population comprised all teacher trainers (lecturers) of Colleges of Education in Delta State. The sample of 135 lecturers, subjects were randomly selected using the stratified sampling technique. Four hypotheses were raised and tested at the alpha level of 0.05 significance using Pearson Product Moment Correlation statistics. The results revealed that there was no significant relationship between ICT and lesson presentation and access to information on teaching materials. The study also revealed a non-significant relationship between ICT and students effective learning and professional supports. Based on the findings and conclusion, it was recommended that government should provide ICT accessories and infrastructures in all colleges of education, adequate fund and proper electricity should be provided. Also refresher courses should be organized for teacher trainers and trainees on the operation and usage of ICT.

Key words: Information communication technology, teacher education, lecturers, teacher trainees, ICT accessories, ICT Infrastructures

INTRODUCTION

In Nigeria the need for qualified teachers has gained pre-eminence because it is considered that teacher education is a means of not only providing teachers with the necessary skills and knowledge needed to adequately carry out their teaching jobs but as well as for professional growth (Osunde and Omoruyi, 2004). Teacher education is the process of training that deals with the art of acquiring professional competences and professional growth. It is essential exercise that enhances the skills of learning and teaching. Teacher education is designed to produce highly motivated, sensitive, conscientious and successful classroom teachers who will handle students effectively and professionally for better educational achievement (Ololube, 2005a, b). Amedeker (2005) opined that inadequate teacher preparation programmes results in majority of teachers inability to demonstrate adequate knowledge and understanding of the structure, function and the development of their disciplines. Therefore, an effective teacher education programme is a prerequisite for a reliant education which leads to a good level of confidence to both the teacher and their students as a result of which learning is coordinated effectively and professionally and problem inherent in

teacher's education rectified and solved (Lawal, 2003). Teacher education programmes in Nigeria are under the supervision and control of government organizations.

Information and Communication Technologies (ICTs) have become key tools and had a revolutionary impact on how we see the world and how we live in it. This phenomenon has given origin to the contemporary advances in the ways of life. ICT is having a revolutionary impact on educational methodology globally. However, this revolution is not widespread and need to be strengthened to reach a large percentage of the population. In a complex society like Nigeria specifically in Delta State many factors affect ICT use and integration, so an interdisciplinary and integrated approach is very necessary to ensure the successful development of teacher educational programmes (MacIkemenjima, 2005). The integration of Information and Communication Technologies (ICTs) in higher education has been the topic of good deal of debate. In Delta State, the relationship between the development of ICTs penetration and use in teacher education programmes and its diffusion into the programmes in colleges of education is dependent upon governmental policies. The pervasiveness of ICT has brought about rapid changes in technology, social, political and global

economic transformation. However, the field of education has not been unaffected by the penetrating influence of information and communication technology. Unquestionably, ICTs has impacted on the quality and quantity of teaching, learning and research in teacher education. Therefore, ICT provides opportunities for student-teachers, academic and non-academic staff to communicate with one another effectively during formal and informal teaching and learning (Yusuf, 2005). In the same vein, teachers need training not only in computer literacy but also in the application of various kinds of educational software in teaching and learning (Ololube, 2006). Furthermore, they need to learn how to integrate ICTs into their classroom activities and school structure. The quality of teachers is known in virtually all countries to be a key predictor of students learning (Ololube, 2005a, b). Therefore, teacher training is enhanced using ICTs because ICTs are tools that can facilitate teachers training and help them take full advantage of the potentials of technology to enhance student learning (UNESCO, 2003).

There are deluge of challenges confronting the application of ICTs in teacher training and in the educational system in general. These challenges include limited ICT infrastructure, lack of information literacy in teachers and teacher trainers-technophobia, poor or non-existence internet connectivity, inadequate learning resources including related educational tools, course curriculum and other learning materials, attitude of teacher-trainees and teacher-trainers which indicate a gross lack in independent learning skills and reluctance to take responsibility for their own learning, software license and highly prohibitive costs associated with the maintenance and technical support as well as poor power supply.

From the foregoing it is distressing to observe that Delta State fall below expectations regarding the use of ICTs in general and particularly in instructional and learning activities in teacher training programmes. The disparity in access to information and communication technology is occasioned by many and diverse problems including, low bandwidth for internet access, lack of fund to embark on full scale computerization, irregular supply of power, inadequate functional telephone lines and other infrastructural facilities needed to support the efficient and effective introduction and development of the technology.

There is also short of manpower for effective utilization of software and for maintenance. Qualified programmers, engineers and technicians are equally difficult to find and when they are found, the (public) education sector cannot afford to retain them as competition from the private sector is fierce. This lack of

manpower breeds a compendium of other problems. Teachers can only pass on skills and ideas to the learners, if they are masters of their trade and they are at the cutting-edge of knowledge and development in their disciplines. This is unfortunately the case here in Delta State, most teachers at all sectors of the education system have minimal or low ICT skills and hardly use existing opportunities to develop them. But this generation cannot survive the challenges posited by the contemporary social realities with this level of ignorance, technophobia and information paranoia of the teaching force. This development, therefore call for a re-thinking of the strategies that are adopted for teacher production in order to enhance the drive towards sustainable development.

Fundamentally, the slow access to basic ICT equipments, low internet connectivity and computers and the inadequacies in the use of audiovisual materials and equipment including films, slides, transparencies, projectors, globes, charts, maps, bulletin boards, plus programmed materials, information retrieval systems and instructional television in teacher education programmes are barrier to the effective and professional development of teachers in Nigeria (Ololube, 2006). Therefore administrators and trainers need to make educational technology an integral part of teaching and learning to provide a clear demonstration of how the use of instructional technology tools can address the personal and general concerns of teaching and learning in Nigeria.

Any training programme is thus concerned with improved way of doing things or carrying out various activities in a professional manner. The contribution of the information and communication technologies can be very useful for the development of skills as it provides effective training programmes which can be attributed to its capacity for stimulation, model-building and interactive adaptation. This usage applies not only to subject like sciences and languages but also to various aspects of professional courses like teacher training. ICTs could assist in development of administrative skills related to student management, tutoring, course writing and pedagogic skills in education.

Information and communication technologies can be very effective for facilitating teacher education, programme both as a tutor or student. On the more positive side, there are several reported benefits of introducing and using ICT as part of the teaching and learning process. Lafarriere *et al.* (1999) argue that there are significant benefits in using ICT as part of the teaching and learning process as long as teachers recognize the relationship between use of ICT and the overall curriculum. With reference to the Nigerian situation, the ICT policy for education also stresses the

importance of integrating ICT across the curriculum, rather than teaching about ICT. Furthermore, there is need for thorough curriculum planning for successful integration of ICTs.

Haddad and Daxler claim that different ICTs do make some valuable contributions to various parts of educational development and effective learning through expanding access, promoting efficiency, improving the quality of learning, enhancing the quality of teaching and improving management systems. Roberts looks at how the use of technology can enhance teaching and learning to improve student achievements and provide access to a variety of educational materials.

Nonetheless, all the potentials of ICT for education cannot be realized without an effective educational policy in place making concrete decisions about teaching with ICT making sure the necessary infrastructure is in place having more than enough relevant content prioritise professional development and decide on how it must be integrated.

Olakulehin (2007) emphasized that pedagogic application of ICTs involves effective learning with the aid of computers and other information technologies, serving the purpose of learning aids which plays complementary roles in teaching/learning situations, rather than supplements to the teacher/instructor/facilitator. Computer is regarded as add-on rather than a replacing device. The pedagogic uses of the computer necessitate the development among teachers as well as students of skills and attitude related to effective use of information and communication technologies. Aside of literacy, ICTs also facilitates learning to programme, learning in subject areas and learning at home on one's own and these necessitate the use of new methods like modeling, simulation, use of data bases, guided discovery, closed-word exploration etc. The implications in terms of changes in the teaching strategy, instructional content, role of the teachers and context of the curricula are obvious as well as inevitable.

Pedagogy through the application of information and communication technologies has the advantage of heightening the motivation helping recall previous learning; providing new instructional stimuli; activating the learner's response providing systematic and steady feedback; facilitating appropriate practice; sequencing learning appropriately and providing a viable source of information for enhanced learning. Teachers who use this system of instructional strategy would be able to kindle in the hearts of the learners a desirable attitude towards information technology tools in their entire way of life.

Statement of problem: It is appalling that despite effort by both the federal and state governments to establish valuable and effective teacher education programmes in Nigeria to help in the preparation of competent teachers, there is a fundamental problem which has incapacitated its development.

This problem is the lack of adequate ICTs infrastructure available in the teacher education programmes, this has reduced access to ICT instructional materials to teacher trainers and trainees. Even at the school level, teachers hardly come in contact with ICT aided instructional materials.

Many Nigerian teachers have been unable to find effective ways to use technology in their classrooms or any other aspect of their teaching and learning life. The possible explanation for this lack of success by teachers is that the use of technology in the classroom has not been encouraging and teachers are not well trained in using ICTs in teaching as a means for educational sustainability (Ololube, 2006).

Therefore, the statement of problem is how does Information Communication Technology (ICT) influence teacher education and professional development in Delta State of Nigeria?

Hypothesis: The following hypotheses were formulated to guide the study and tested at 0.05 level of significance:

- There is no significant relationship between ICT and lesson presentation
- There is no significant relationship between ICT and access to information on teaching materials
- There is no significant relationship between ICT and students effective learning
- There is no significant relationship between ICT and professional supports

Purpose of the study: The purpose of this study is to examine the influence of Information Communication Technology (ICT) on teacher training and professional development in Delta State of Nigeria. This study also intends to examine:

- How ICT influences lesson presentation
- If there is a relationship between ICT and access to information on teaching materials
- Whether there is a relationship between ICT and students effective learning
- The relationship between ICT and professional supports

MATERIALS AND METHODS

The survey method was adopted for this study. This study was correlational in nature because it sought to establish the relationship between the dependent and independent variables. The population of the study comprised all teacher trainers (lecturers) of colleges of education in Delta State of Nigeria.

The sample was made up of 135 lecturers which were selected using the stratified random sampling technique. The selection was restricted to only master's degree holders (M.Ed) and doctorate degree holders (Ph.D) in education. A four point scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) was used to measure the 58 items in the instrument.

The face and content validity of the instrument was established. The reliability of the instrument was tested using the test-re-test method and the (r) value obtained was .72 as the coefficient of subject stability. The hypotheses were analyzed using the Pearson product moment correlation coefficient statistics and tested at alpha level of significant of 0.05.

RESULTS AND DISCUSSION

Hypothesis 1: There is no significant relationship between ICT and lesson presentation. In Table 1, the r-calculated value of 0.068 was less than the r-critical value of 0.1946. Hence, the null hypothesis was retained. This shows that there was no significant relationship between ICT and lesson presentation on teacher education and professional development.

Hypothesis 2: There is no significant relationship between ICT and access to information on teaching materials. Table 2 shows that the r-calculated value of 0.015 was less than the r-critical value of 0.1946. Hence, the null hypothesis was retained. This indicates that there was no significant relationship between ICT and access to information on teaching materials on teacher education and professional development.

Hypothesis 3: There is no significant relationship between ICT and students effective learning. Table 3 shows that the r-calculated value of 0.091 was less than the r-critical value of 0.1946. Hence, the null hypothesis was retained. This shows that there was no significant relationship between ICT and students effective learning on teacher education and professional development.

Hypothesis 4: There is no significant relationship between ICT and professional support. In Table 4, the r-calculated value of -0.108 was less than the r-critical value of 0.1946. Hence, the null hypothesis was retained. This shows no relationship between ICT and professional support on teacher education and professional education and development.

This study tested four hypotheses on the influence of Information Communication Technology (ICT) on teacher training and professional development. Hypothesis one in the study revealed that there is no significant relationship between ICT and lesson presentation. This could be as a result that there are little or no ICT infrastructural facilities in the teacher training institutes that were used in this study. This finding agrees

Table 1: Pearson product moment correlation coefficient of ICT and lesson presentation

Variables	N	\bar{X}	SD	DF	r-cal	r-crit	Level of sig.	Decision
ICT	135	18.20	2.36	268	0.068	0.1946	0.05	Not significant
Lesson presentation	135	16.81	2.09	-	-	-	-	(Retained)

Table 2: Pearson product moment correlation of ICT and access to information on teaching materials

Variables	N	\bar{X}	SD	DF	r-cal	r-crit	Level of sig.	Decision
ICT	135	18.20	2.36	268	0.015	0.1946	0.05	Not significant
Access to information	135	16.54	2.00	-	-	-	-	(Retained)

Table 3: Pearson product moment correlation coefficient of ICT and student's effective learning

Variables	N	\bar{X}	SD	DF	r-cal	r-crit	Level of sig.	Decision
ICT	135	18.20	2.36	268	0.091	0.1946	0.05	Not significant
Students learning	135	16.58	2.02	-	-	-	-	(Retained)

Table 4: Pearson product moment correlation coefficient of ICT and professional supports

Variables	N	\bar{X}	SD	DF	r-cal	r-crit	Level of sig.	Decision
ICT	135	18.20	2.36	268	-0.108	0.1946	0.05	Not significant
Professional supports	135	17.43	1.87	-	-	-	-	(Retained)

with MacIkemenjima (2005) who said that in a complex society like Nigeria, many factors affect ICT's use and integration, so an interdisciplinary and integrated approach is very necessary to ensure the successful development of teacher education programmes.

Hypothesis two showed that there is no significant relationship between ICT and access to information on teaching materials. This finding is at variance with Lafarriere *et al.* (1999) who opined that there are significant benefits in using ICT as part of the teaching and learning process including accessibility to information materials from all parts of the world.

Hypothesis three pointed out that there is no significant relationship between ICT and students effective learning. The plausible reason for this finding is that there are little or no ICT instructional and infrastructural facilities/equipment in the teacher education institutions that were used for this study. This finding is at variance with that of Robert who is of the view that the use of ICT enhances teaching and learning to improve students achievement and provide access to variety of educational materials.

Hypothesis four revealed that there is no significant relationship between ICT and professional support on teacher training and professional development. This finding is at variance with Haddad and Draxler who observed that ICT make valuable contributions to various parts of educational development and effective learning through expanding access, promoting efficiency, improving the quality of learning, enhancing the quality of teaching and improving management systems.

CONCLUSION

There is no significant relationship between ICT and lesson presentation. The reason could be that teacher trainers in these institution lack up to date information on the desired motives behind ICT. There is no significant relationship between ICT and access to information on teaching materials. The plausible reason could be that there are little or no infrastructural facilities and equipment.

There is no significant relationship between ICT and students (teacher trainees) effective learning. Inadequate ICT instructional facilities and constant electricity supply which accounts for little usage of ICT could be the reason for this result. There is no significant relationship between ICT and professional development. The reason for this result could be due to lack of information literacy in teacher trainers and trainees, poor or non-existence internet connectivity, inadequate learning resources,

attitude of teacher trainers and trainees which indicate a gross lack in independent learning skill and high prohibitive costs associated with the maintenance and technical support.

RECOMMENDATIONS

The following recommendations were made that:

- Government should provide computers, internet and other ICT infrastructures in all the colleges of Education in Delta State so as to encourage lecturers to use them
- Teacher training and professional development oriented policies should support ICT-related teaching models that encourage both students and lecturers to play active role in teaching and learning activities. Emphasis must be placed on the pedagogy behind the use of ICTs for teaching and learning
- Parents should encourage their children and wards to take advantage of the numerous benefits provided by ICT by making available computers and other information communication tools to enhance their learning
- Refresher courses in form of workshops, conferences or seminars should be organized for teacher trainers and trainees on the operation and usage of ICT
- Adequate fund should be provided for colleges of education for proper management of ICT accessories available
- There should also be constant supply of electricity

REFERENCES

- Amedeker, M.K., 2005. Reforming Ghanaian teacher. Education towards preparing an effective pre-service teacher. *J. Educ. Teaching*, 31: 99-110.
- Lafarriere, T., A. Breuleux and R. Bracewell, 1999. Benefits of Using Information Communication Technologies (ICT) for Teaching and Learning in K-12/13 Classrooms. Schoolnet, Canada.
- Lawal, H.S., 2003. Teacher education and the professional growth of the 21st Century Nigeria Teacher. The African Symposium, Vol. 3.
- MacIkemenjima, D., 2005. E-education in Nigeria: Challenges and prospects. Proceedings of the 8th UN ICT Task Force Meeting April 13-15, Dublin, Ireland.
- Olakulehin, F.K., 2007. Information communication technologies in teachers training and professional development in Nigeria. *Turk. J. Distance Educ. TODJE*, 8: 133-142.

- Ololube, N.P., 2005a. School effectiveness and quality improvement: quality teaching in Nigerian secondary schools. *Afr. Symp. Line J. Afr. Educ. Res. Network*, 5: 17-31.
- Ololube, N.P., 2005b. Benchmarking the motivational competencies of academically qualified teachers and professionally qualified teachers in Nigerian secondary schools. *Afr. Symp. Line J. Afr. Educ. Res. Network*, 5: 17-37.
- Ololube, N.P., 2006. Teachers instructional material utilization competencies in secondary schools in Sub-Saharan Africa: Professional and non-professional teachers perspective. *Proceedings of the 6th International Educational Technology Conference EMU*, April 19-21, North Cyprus, pp: 1303-1314.
- Osunde, A.U. and F.E.O. Omoruyi, 2004. An evaluation of the national teachers institutes manpower training programme for teaching personnel in mid-Western Nigeria. *Int. Educ. J.*, 5: 405-409.
- UNESCO, 2003. Manual for pilot testing the use of indicators to access impact to ICT use in education. <http://www.unescobkk.org/education/ict/themes/measuring-and-monitoring-change/indicators-database-asia-pacific-regional-survey/manual-for-pilot-testing-the-use-of-indicators-to-assess-impact-of-ict-use-in-education/>.
- Yusuf, M.O., 2005. An investigation into teachers self-efficacy in implementing computer education in Nigerian secondary schools. *Meridian: A Middle School Comput. Technol. J.*, Vol. 8, Issue 2.