Information and Communication Technology on Course Leverage and the Development of Teacher Education at Kwara State College of Education, Ilorin

Dr. K. K. Salau
Kayode_salau@yahoo.com

Dr. MUSTAPHA, A.
mustaphaabdulrafiu67@gmail.com
Borstal Training Institue, Ilorin

Mrs. ADEFILA, E. J[1]
adebu08@yahoo.com
Department of Mathematics

Mr. IFABIYI, A. O.[2]
fabson01@gmail.com
Technical Education

Mrs. AJIBOLA O. E[3]
Oluwafemi.Ibilola@yahoo.com
Computer Science Department
[3,4,5]Kwara State College of Education, Ilorin

Abstract
The study was carried out to examine application of Information and Communicatio Technologies (ICTs) on course leverage and the development of teacher education i Kwara State College of Education, Ilorin. Specifically, the study examined the influenc of ICTs on course leverage and develo pment of teacher education. The study adopte descriptive survey and made use of questionnaire to elicit information from th respondents. Data gathered were analysed using inferential statistics of t-test. To ensur the instrument used for data collection is valid, it was given to experts in test an measure, while test and retest technique was employed to test the reliability. Th instrument was administered on respondents who were not part of the target populatio twice within an interval of two weeks. Data gathered from the two administrations wer subjected to Pearson product moment correlation and a coefficient obtained, 0.86 wa considered high enough. This confirmed that the instrument was valid. The dat analysed revealed that there was no significant difference between the mean ratings o male and female lecturers on the influence of application of ICTs on course leverage. Furthermore, the result of the study showed that there was no significant difference between the mean ratings of male and female lecturers on the influence of application o ICTs on the development of teacher education. The study concluded that application o ICTs in tertiary institutions has the potentials of fostering development in the educational system. It also brought to light the synonymous opinions of male and female lecturers as regard the tendency of ICTs to serve as leverage in the development of teacher education. On the basis of these findings, the study recommended that the State Government should provide adequate computers and other ICT resources and infrastructure to ensure a meaningful integration and implementation of ICT in teaching and learning process.

Keywords: Information and Communication Technologies (ICTs), Course Leverage, Development of Teacher Education.

Introduction

Education is a contrivance to foster national development and a potent tool towards achieving national goals. It is also recognised as one of the crucial allies of the development process and essential for human societies; it is a fundamental leverage for social preservation and economic growth. For centuries, the way education is performed remained the same: the teacher talks and acts, while pupils listen, watch and write. Printing machines made textbooks widely available and knowledge rapidly spread. Meanwhile, education in its entirety has it strength on the success or otherwise of teaching and learning process.

In Nigeria, the challenge of teacher training and professional development appears to be the most daunting challenge facing the education system in Nigeria, especially when considering the centrality of teachers and educational administrators' role to course leveraging and the development of teacher education (Abdul-rahman, 2020). Also, the way education was performed did not change so much and remained teacher-centered. With the emergence of new technological devices for handling picture and sound, new possibilities for knowledge transmission emerged. Instead of handmade drawings, photos could be used to present study subjects. Using audio recordings, pupils learning foreign languages could at their convenience listen to native speakers and practise their lessons.

With animated pictures and movies, a science oriented course could be illustrated with the visual transcription of a complex experiment. Television took education a step further as lectures and seminars could be broadcasted. Rapid development in Information and Communication Technologies (ICT) is shaping a new world in which education at all levels can no longer be assimilated to a group of learners in a classroom listening and watching a teacher with a textbook following a fixed curriculum. With ICT, learning is shifting from teacher-centered to learner-centered and can potentially be undertaken anytime and anywhere, from classrooms to homes and offices.

Researchers such as Abdul-rahman (2020), Tahir (2020) and Olakulehin (2017) have observed that out of all the educational problems that beset the education sector today, none is as persistent or as compelling as the one relating to the training of competent teachers. Moyosore (2021) posed that student enrolment is soaring record high and for higher education system, which includes colleges of education, to cope, classes are rapidly increasing in size and Staff-Student Ratio (SSR) – the ratio of full time equivalent staff to full time equivalent students – are perpetually decreasing. Questions arise as to the quality of teaching and learning process that takes place in large classroom.

Statement of the Problem

There is no doubt the link between teacher education and falling standard of education in Nigeria. Apart from several other reasons advanced for the falling standard of education in Nigeria (Ogunyinka, 2015); level of development of teacher education also contributes to the educational challenge. Although teacher education, both pre-and in-service, programmes are offered in Nigeria by different teacher education institutions (as provided in the National Policy on Education), and varying degrees of success recorded, various problems still confront the programme with far reaching consequences in Nigeria's educational system. While other countries of the world have taken advantage of Information and Communication Technology to develop their education system, it is unfortunate that Nigeria has not fully taken the advantage. Thus, the study examined information and communication technology on course leverage and the development of teacher education at Kwara State College of Education, Ilorin.

Research Objective

This study examined the influence of Information and Communication Technologies (ICTs) on course leverage and development of teacher education.

Research Hypotheses

Ho_1: There is no significant difference in the mean ratings of male and female lecturers on the influence of application of ICTs on course leverage in Kwara State College of Education, Ilorin.

Ho_2: There is no significant difference in the mean ratings of male and female lecturers on the influence of application of ICTs on development of teacher education in area such as self-evaluation, pedagogical learning, adaptability, communication, organisation, innovation, leadership, and continuous learning in Kwara State College of Education, Ilorin.

Conceptual Definitions

Information and Communication Technologies (ICTs) and course leverage were the two major concepts operationally defined here for avoidance of ambiguity in their meaning.

Information and Communication Technologies (ICTs):

Information and Communication Technologies (ICTs) are electronic technologies used for information storage and retrieval purposes. ICT can be regarded as the collection of various technological gadgets and resources to communicate, generate, distribute, collect and administer information among others (Bandele, 2018). This is the totality of methods and tools that could be used to gather, store, process, communicate and share information in diverse ways. The coming of ICT is consequential to growth and development of any nation in all areas of human endeavour. It is noted today, if not in all walks of life, that almost everything is tailored to online transactions with the application of ICT strategies. Fast development in Information and Communication Technologies (ICT) is shaping a new world in which education at all levels can no longer be assimilated to a group of learners in a classroom listening and watching a teacher with a textbook following a fixed curriculum. With ICT, learning is shifting from teacher-centered to learner-centered and can potentially be undertaken anytime and anywhere, from classrooms to homes and offices.

Course Leverage:

Leverage is used to describe the relationship between interrelated variables. Information and Communication Technology is used as independent variable; thus it is kept constant. As such, the indicators of the dependent variable, that is, development of teacher education, are self-evaluation, pedagogical learning, adaptability, communication, organisation, innovation, leadership, and continuous learning. As a result of this, course leverage represents the relationship between ICTs and development of teacher education.

ICTs for Course Leverage and Development of Teacher Education

The idea that teaching and learning can successfully take place through the application of electronic communication facilities between teachers and students is one which had generated, sometimes, hope and dismay and at other times, excitement and fear. Hope that many more learners can be reached at a more convenient pace that had erstwhile been the case, dismay that the infrastructures necessary for deploying an

effective ICT platform is lacking in low-income countries like Nigeria. However, the use of information and communication technologies in the educative process has been divided into two broad categories: ICTs for Education and ICTs in Education (Olakulehin, 2017). Olakulehin (2017) stressed that ICTs for education refers to the development of information and communications technology specifically for teaching/learning purposes, while the ICTs in education involves the adoption of general components of information and communication technologies in the teaching learning process.

Generally, the educational relevance of computers and other components of information technology cannot be overemphasised. According to Osuagwu, Agbasonu, Ndigwe, Irene and Sulaiman (2019), from the period when Skinner applied programmed instructions to teaching machines, through Brunner's experiment with computers in instruction, to the current wave of information transmission and exchange via the worldwide web, we have seen different applications of ICTs in enhancing cognitive development.

In a classification by Enang and Okute (2019), the application of computers and other communication technologies in education was divided into three broad categories: Pedagogy, Training and Continuing Education. The pedagogical applicability of the ICTs is concerned, essentially, with the more effective learning with the aid of the various components of ICTs. Almost all subjects ranging from mathematics (the most structured) to music (the least structured) can be learnt with the help of computers. According to Olakulehin (2017), it should be emphasised 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

In fact, the 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 communications technologies. Besides 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 (Enang & Okute, 2019).

As Olakulehin (2017) puts it pedagogy through the application of information and communications 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 are trained with 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. The concept of training refers to the development of skills and a skill as we know, is a well coordinated psychomotor activity.

Any training programme is thus concerned with improved ways of doing things, of carrying out various activities in a professional manner. The contribution of the information and communications technologies can be very useful tool 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 subjects like sciences and languages, but also to various aspects of professional courses like engineering and teacher training. ICTs could assist in development of administrative skills related to student management, tutoring, course writing, pedagogic skills in education and examinations such as Computer Based Test (CBT). The concept of lifelong education is associated with a learning society, in the contemporary society; the end of formal education does not mean the end of one's learning.

From the broad categorisations of the applications of ICTs defined above, the relevance of ICTs for and in education with specific reference to the professional development of teachers in Nigeria can be easily understood. There are general ICT competencies, common to all users in education, regardless of the subject area. There are also specific competencies and skills which find expression more in specific subject areas and specialisation of teachers and trainee-teachers. The general ICT competencies include the general understanding of the basic building blocks of the computer systems, literacy in operating the computer and using the windows interface called windows explorer and other similar interfaces such as Mackintosh or Apple.

The understanding of word processing activity, usage of PowerPoint slides to enunciate aspects of their teaching activities, through to the application of basic features of spreadsheet packages or excel sheets and using facilities like Microsoft access to create databases for their students' records, would comprise the general skills and abilities required of would-be teachers. This is the more popular view of what computer education portends in the existing teacher training process. All teacher trainees are expected to have all these rudimentary skills in computer application irrespective of whether they specialize in the arts, sciences, or the social sciences.

Application of ICTs in continuing education is well pronounced in Nigeria. In defining continuing education, there are relatively few assertions that one can make without generating controversies and queries. One can assert that, without disputation: that continuing education is within the bigger concept of education and therefore obeying the major criteria that differentiate education from other ordinary social activities; that it is not the initial or the beginning education for anybody undergoing such education; and that it is concluded outside of the formal/ institutionalised school system and hence called out of school education (Muhammad, Abdullahi & Isah, 2019).

According to Tahir (2020), Continuing Education connotes that subset of adult education that seeks to positively link the needs and aspirations of individuals with educational activities, for development of their potentialities and for the socioeconomic and political development of a nation state. Furthermore it is a process of adoption of the worker training to technological changes and the resultant increase in the minimum knowledge required (Tahir, 2020). Continuing Education as a form of education activity organised and run outside the formal school system at times, parallel to it but often times go beyond the preview of the school system.

Muhammad, Abdullahi and Isah (2019) asserted that application of Information and Communication Technologies has helped in the conduct of examination, processing of students' admission, dissemination of information, keeping of students' records, and enhancement of teaching and learning process in many continuing education centres in Nigeria.

The specific ICT competencies refer to the special skills a teacher trainee acquires in other to enhance the quality of the teaching and learning that takes place in the school. The special skills cannot be acquired without the general abilities, and the

general abilities are not of much benefit if a teacher does not possess specific skills for applying ICTs in his teaching activities. Studies in ICT development in both developed and developing countries identify at least four broad approaches through which ICTs could be adopted for teacher training and professional development. The four broad approaches, according to Thakral (2021), are providing courses in a mutual situation, training in demand, orientation and refresher courses through video conferencing and online.

Methodology

The descriptive survey design was used for this study. The population for the study consisted of the lecturers of all the three selected schools at Kwara State College of Education, Ilorin, viz.: School of Sciences, School of Social Sciences, and School of Languages. The population of lecturers in these schools is 91. This figure serves as the population of the study. Furthermore, two departments were randomly selected from each of three schools and five lecturers each randomly selected from the six departments. The sample for the study was made up of 30 lecturers randomly selected. A self-designed questionnaire tagged "ICT on Course Leverage and the Development of Teacher Education" was used to collect the data for the study. To ensure validity of the instrument, it was given to two experts in test and measure. Their observation and suggestions were considered in making the final draft. Also, test and retest method was used to ascertain reliability of the instrument. The instrument was administered twice to 20 lecturers in the School of Vocational and Technical Education, Kwara State College of Education, Ilorin who were not part of the study. Data collected from the two administrations were subjected to Pearson product moment correlation and the coefficient obtained was 0.86. All lecturers at the participating schools were asked to complete a questionnaire to collect data about their opinions on the application of ICTs on course leverage, and efficient use of ICT tools in development of teacher education. The questionnaire was administered by the researchers in the individual schools. Personal contacts of the researchers with the respondents enhanced good and prompt response from the respondents. Data collected were analysed using t-test statistical tool through Statistical Package for Social Sciences (SPSS) version 17.0.

Results and Discussion

Ho_1: There is no significant difference in the mean ratings of male and female lecturers on the influence of application of ICTs on course leverage in Kwara State College of Education, Ilorin.

Table 1: Analysis of male and female lecturers' responses on influence of application of ICTs on course leverage

Variable	N	$\bar{x}$	S.D	df	t-cal	p-value	Decision
Male	18	11.0	5.88	4	1.037	2.775	Ho_1 is accepted
Female	12	8.0	5.88				

at 0.05 alpha level (2-tailed), p-value= .358

Table 1 shows the analysis of male and female lecturers' responses on influence of ICTs on course leverage. It is observed from the table that the t-statistic, t =1.037, critical t-value is 2.775 and p = .358; that is, value of t-calculated is less than critical t-value and the p-value is greater than 0.05. The null hypothesis is accepted, since p>0.05 (in fact p = 0.358) at 0.05 alpha level and degree of freedom 4 (2 tailed). Therefore, there is statistical evidence (t =1.037, p = 0.358) that both male and female lecturers perceived

the influence of application of ICTs on course leverage as important.

Ho_2: There is no significant difference in the mean ratings of male and female lecturers on the influence of application of ICTs on development of teacher education in Kwara State College of Education, Ilorin.

Table 2: Analysis of male and female lecturers' responses on influence of ICTs on development of teacher education

Variable	N	$\bar{x}$	S.D	Df	t-cal	p-value	Decision
Male	18	13.0	6.71	4	1.586	2.775	Ho_2 is accepted
Female	12	7.0	6.71				

at 0.05 alpha level (2-tailed), p=.223

Table 2 shows the analysis of male and female lecturers' responses on influence of application of ICTs on development of teacher education. It is observed from the table that the t-statistic, t=1.586, critical t-value is 2.775 and p=.223; that is, value of t-calculated is less than the critical t-value and the p-value is greater than 0.05. The null hypothesis is accepted, since p>0.05 (in fact p=0.223) at 0.05 alpha level and degree of freedom 4 (2 tailed). Therefore, there is statistical evidence (t= 1.586, p = 0.223) that male and female lecturers perceived the influence of application of ICTs on development of teacher education as significant.

Discussion of Results

The findings of the study revealed that both male and female lecturers perceived the influence of application of ICTs on course leverage as important. This agrees with the findings of Osakwe (2020). Osakwe examined influence of Information and Communication Technology (ICT) on teacher education and professional development in Delta State, Nigeria and found that there was no significant relationship between ICT and lesson presentation and access to information on teaching materials. Osakwe, however, found that male and female teachers perceived influence of ICTs on teacher education and professional development as important.

Also, the findings of the study showed that male and female lecturers perceived the influence of application of ICTs on development of teacher education (self-evaluation, pedagogical learning, adaptability, communication, organisation, innovation, leadership, and continuous learning) as significant. This is similar to what Olakulehin (2017) found in the study of information and communication technologies in teacher training and professional development in Nigeria. Olakulehin reported that out of all the educational problems that beset the education sector today, none is as persistent or as compelling as the one relating to the training of competent teachers in the use of Information and Communication Technology.

Conclusion

The study concludes that application of ICTs in tertiary institutions has the potentials of fostering development in the educational system as it helps in producing the skills and knowledge that are needed in the electronic-world through the use of new technologies that could facilitate personalised learning, foster technology-enabled collaborative learning, reduce time and space barriers and apply evolving technologies in the teaching profession. The study brought to light the synonymous opinions of male

and female lecturers as regard the tendency of ICTs to serve as leverage in the development of teacher education. It also explained how technology-enabled collaboration could foster development in teaching and learning process.

Recommendations

The study recommends that, as a matter of urgency, the State Government should provide adequate computers and other ICT resources and infrastructure to ensure a meaningful integration and implementation of ICT in teaching and learning process. The study also recommends that lecturers in Kwara State College of Education, Ilorin should take the advantage of Information and Communication Technology to improve on self-evaluation, pedagogical learning, adaptability, communication, organisation, innovation, leadership, and continuous learning.

References

Abdul-rahman, A.I. (2020). ICT competences and level of its application for educational studies in Nigeria in the mid of Covid-19. *Journal of Economics and Sustainable Development, 11*(16), 92-100.

Bandele, S. O. (2018). Development of modern ICT and internet system. In Agagu, A.A. (ed). *Information and communication technology and computer applications.* Abuja: Pan of Press.

Enang, C.E. & Okute, A.L.(2019). Leveraging on new technologies for skill acquisition ofbusiness education in tertiary institutions in Nigeria for thee-world. *Nigerian Journal of Business Education, 6*(1), 331-337.

Moyosore, S.E. (2021). The use of activity theory to explain the complexities surrounding the use of ICT in overcrowded university classroom: The case of Nigeria. Unpublished Ph.D. thesis, Auckland University of Technology, Auckland.

Muhammad, S.H., Abdullahi, U.A. & Isah, N.K. (2019). Continuing education in Nigeria (meaning, objectives, forms and prospects). *European Scientific Journal, 9*(10), 168-175.

Ogunyinka, E. (2015). Teacher education and development in Nigeria: An analysis of reforms, challenges and prospects. *Education Journal, 1*(1), 10.11648/j.edu.20150403.14.

Olakulehin, F.K. (2017). Information and communication technologies in teacher training and professional development in Nigeria. *Turkish Online Journal of Distance Education– TOJDE, 8*(1), 133-142.

Osakwe, N.R. (2020). The influence of Information and Communication Technology (ICT) on teacher education and professional development in Delta State, Nigeria. *Asian Journal of Information Technology, 9*(5), 280-285.

Osuagwu O.E., Agbasonu, V.C., Ndigwe, C., Irene, E. & Sulaiman, U. (2019). ICTand pragmatism: Creating sustainable employment for graduates in Nigeria. *West African Journal of Industrial and Academic Research, 13*(1), 41-53.

Tahir, G (2020). *Continuing education policy provisions and options in Nigeria* Germany: John Meinert publishing.

Thakral, P. (2021). Role of ICT in professional development of teachers. *Learning Community, 6*(1), 127-133.

Identification of Development Training Needs for the Integration of Ict in Instructional Delivery in Public Secondary School in Bayelsa State

KOLUBOWEI, Woyengikuro
Kolus1964@yahoo.com, +2348066824376.
Department of Educational Management
Faculty of Education
Ignatius Ajuru University of Education
Port Harcourt, Rivers State

Abstract

The study investigated identification of development training needs for the integration of ICT in instructional delivery in public secondary school in Bayelsa State. The study adopted descriptive survey design. The population of the study is 354 teachers in all the public secondary chools in Byelsa State. Among this number, 1865 are male while 1649 are female. Through a stratified random sampling technique; a sample of 467 teachers whose gender distribution were 211 male and 243were female were randomly selected. The instrument for data collection was a self-designed instrument captioned "Identification of ICT Needs for Teachers Development Questionnaire (IINTDQ)". The questionnaire was rated according to the modified Likert scale of Very High Extent (VHE)-4, High Extent (HE)-3, Low Extent (LE)-2, Very Low Extent (VLE)-1. The instrument was content and face validated and a reliability coefficient of 0.88 was determined through the Cronbach alpha statistics. In analyzing the data, simple percentage was used to answer the research question 1, while mean score and standard deviation was used to answer research question two 2 and 3. The hypotheses were analysed using z-test. It was revealed among others that to a very low extent, teacher applies ICT competencies in the integration of ICT in instructional delivery in public secondary school in Bayelsa State. It was also concluded that when teachers have the appropriate training, they may use ICT to assure quality instructional delivery. Based on the conclusion, it was recommended among others that the government and the school boards should liaise with private institutions that are very competent to train and retain teachers to develop the needed skills and the competencies to integrate ICT for instructional delivery in public secondary school in Bayelsa State, and that government should encourage teachers to enroll on ICT training by professional.

Keywords: Identification, Development, Training, Integration of ICT.

Introduction

The school input is changing as the realities in the larger societies are changing. This is because the school stands as the laboratory for social reconstruction. The major emphases now in education bothers significantly in the changes in the nature of learners, population explosion in the school, and other associating factors has changed the strong indicators for an effective teacher to one who fully acquainted with the required knowledge to adopt the available technologies to effectively deliver classroom general and specific objectives (Makrakis, 2011; Fong & Tony, 2011). Hence the notion of routine training for teachers are at this level not a topic to continue with, but an issue that needs radical change to the current realities in the teaching and learning process

(Rohatgi et al., 2016). Considering the observable deficit in performance of teacher who are so subjected to routine teacher development training and promotional exams, one would begin to ask questions bothering on the concept development, when the training has not yielded any developmental value that would be beneficiaries to the end beneficiaries who are the student (Ramírez et al., 2017).

Development is a multidimensional concept; it widely applies in organisation when they clearly show an attempt to make an all encompassing and progressive change in the organisational operations. But more conservatively, development according to Todaro and Smith (2006) the three main objectives of development includes: raising peoples' living levels, (i.e. incomes and consumption, levels of food, medical services, education through relevant growth processes); creating conditions conducive to the growth of peoples' self-esteem through the establishment of social, political and economic systems and institutions which promote human dignity and respect; increasing peoples' freedom to choose by enlarging the range of their choice variables, (e.g. varieties of goods and services) (Amin, 2013). Hence, the concept of development is applicable to the context to which it can be used. Alternatively development can be considered as the qualitative and quantitative upward advancement in the society. Transcending to the school scenario, teacher development entails training that ensures an overall improvement in their life, especially their job performance (Angadi, 2014). Teacher's development and teachers professional development has been long integrated in most schools, but the nature of the integration has not sufficiently reflected the current training needs of the teachers (Bindu, 2016). At current times, an effective teachers training has to reflect the technological needs to effectively function in a world of technology driven school (Buabeng-Andoh, 2019). The technological aspect of the school includes the integration of information and communication technology (ICT). The integration of ICT is when computers, telephone lines and wireless signals, as well as necessary enterprise software, middleware, storage and audiovisual are all components of information technology (IT), which allows teachers to access, store, transmit, understand and manipulate information. ICT is an extensional term for IT, emphasising the role of unified communications and the integration of all these technologies. However, there is death of ICT skills among teacher who still rely on the traditional methods to pass instruction.

Using technology in the classroom to enhance student-centered learning is a major concern in education (Comi et al., 2017). To help students improve their skills in a broad range of subjects, teachers may now use a number of software programmes. For teachers, there is an abundance of options for tailoring instruction based on available technology. Access to a wider variety of materials is required for ICT integration in teaching and learning than had previously been deemed viable (Owolabi, 2013). In order for students to get a deeper knowledge of essential topics, the ICT must encourage higher-order thinking and lifelong learning. Students' learning, productivity, and creativity are all enhanced by the use of technology (Vasslios, 2012). As a result, the ICT is tailored to meet the needs of all children. Students' research, publishing, collaboration, and communication skills are aided and developed through the use of technology. However, the school system filled up with teacher who lacks ICT competencies that meets teaching needs of the 21t century (Sunday, 2015).

The training in this regards are heavily bothered on the certification basically acquired to meet up with criteria for promotion, while the actual training that leads to the

proper integration of ICT in the actual teaching learning process is very critical, the quality of the training is much more important (Sinha & Lamba, 2016). When the criteria of the training are met, the teacher is supposed to demonstrate proficient skill in world wide web, email, desktop conferencing, video conferencing to name but a few among other skills for resume. As a skilled educator, the teachers must be able to integrate these skills (Toyo, 2017).

For instance, word processors are among the most ancient software still available on modern computers, and they are still in use today. A teacher must be proficient in the use of the most up-to-date word processors (Owolabi, 2013). However, it is necessary to be in a position to create extensive and well-formatted papers in order to succeed in this field. The ability to also use spreadsheets is also a vital 21st-century skill for teachers. Such software will be a windfall for instructors who want to carry out their duties in an effective and thorough way. Keeping track of students' grades and presenting them in a visually appealing way are two of the most important aspects of this job (Abdulrahman & Habila, 2017). A teacher must also be familiar with databases. To do this, you need to be able to construct and manage database tables, as well as save and retrieve data from them. In addition to being able to generate the correct queries for the data stored in your institute's databases. Teacher's instructional responsibilities include the use of electronic presentation software (Ioryem, et al., 2017). Thus, students must also show proficiency in the creation of electronic presentations for classroom use. It's commonly known that the Internet is a vast reservoir of information, which may make teaching less stressful. Teachers, in general, must be quick and knowledgeable in their use of the internet to locate relevant instructional materials or data that will benefit their students' learning. The instructor must also be familiar with the fundamentals of advanced search, particularly the use of Boolean operators in search engine queries to get the right information search for (Daramola, 2016). In both professional teaching and personal life, email is now the primary method of written communication (Comi et al., 2017). Teachers must be proficient in a wide range of Computer Applications and email as part of their job duties. Educators are expected to be familiar with a wide range of features and functions offered by these computer programmes (Ekwelem, 2019). Even the use of email attachments in contacts with colleagues and pupils falls under this category (Vasslios, 2012). In order for teachers to stay relevant in their respective disciplines, they must learn the fundamentals of computer networking (Fong & Tony, 2011). They should also do their utmost to study how the school computer network works and how it might aid them in their professional responsibilities (Ottong, 2014). Finally, educators in the 21st century must learn touch typing, which is a vital computer skill (Daramola, 2016). This talent may help you enhance your typing speed and accuracy greatly. By using your motor reflexes instead of sight when typing, you may achieve this (Akele, 2013). The teacher will be able to write more thorough and correct texts in a shorter amount of time if you learn to touch type (Toyo, 2017). When teaching typing, the instructor must show that they are knowledgeable about how to include certain "best practises" in order to avoid accidents and exhaustion. Using the correct typing posture and finger placement on your keyboard are part of this (Amin, 2013). According to Kwok-Wing Lai (2008) in Makrakis (2011), when ICT is utilised in combination with traditional instruction, children learn more in the traditional curriculum and essential skill areas (Angadi, 2014). The use of computers in combination with traditional teaching leads to improved academic achievement in a

variety of subject areas (Adomi, 2015). Children may learn more quickly and retain more of what they learn when they use computers. Students like learning on computers, and their attitudes toward school and education improve as a consequence of their participation with technology. Nevertheless, there are a lot of factor bedeviling factors inhibiting adequate training of teachers for the integration of ICT. Owolabi et al (2013) identified lack of funding as the major challenges to training teachers on the integration of ICT which is instrumental in service delivery. The implication of this is that funding is the bedrock of the entire problems confronting eliciting other challenges. Other problem pointed out are lack technical skills, cost of internet data and shortage of power supply (Vasslios, 2012; Sunday, 2015; Daramola, 2016). Despite the arrays of problems, ICT is a very core of the 21st century and this is a reality that must be accepted if the education system in Bayelsa State must get the needed quality boast.

Statement of the Problem

The school is system is supposed to be al the centre stage where social changes are experimented. Now, the waves of changes have affected the nature-nurture principle of educating a child, the traditional methods are fast giving way to the integration of the innovative and technologically based options. The ICT particularly has become wildly accepted to be a channel for instructional delivery. Most particularly, children who are taught with divorce to the inclusion of ICT may not be able to compete with it counterpart in the international scene. No gain stating the obvious fact that teachers who do not possess the prerequisite skill in computer operation, particularly the preliminary (computer appreciation) knowledge may not attempt utilizing the available ICT facilities. To upgrade their skills, the teachers has been mandated to attend ICT training workshop, that may be organise to boast their knowledge in ICT, other teachers have also privately enrolled with the intention to earn basic certification which are required for their continued stay in the job without gaining the practical knowledge of integrating ICT in their routine teachingjob. This is a clear indication, that even the available ICT facilities in the school may be underutilized as it reflects on the extent of routine classroom integration of ICT in the teaching learning process. Despite the notion that the current situation of ICT training in organized for teacher in public secondary school has laid much emphases of provision of certification devoid of practicability, leaving the actual aim of the process defeated. Furthermore, this has marred the effort of continuous identification of development needs and training needs of the university. Other researches has recommended that more funding should be made available to make ICT training available for teachers irrespective of where they can acquire this training and that the facilities should be made available. Nevertheless, the study did not lay emphases on need to ensure that training made available are tailored to ICT integration in in the school and this constitutes the gap which study intends to bridge by investigating identification of development training needs for the integration of ICT in instructional delivery in public secondary school in Bayelsa State.

Aim and Objectives

The aim of the study is to investigate identification of development training needs for the integration of ICT in instructional delivery in public secondary school in Bayelsa State. But specifically: the study will:

1. Determine the kinds of ICT development training acquired by teachers for the

integration of ICT in instructional delivery in public secondary school in Bayelsa State.

2. Ascertain the extent teacher apply ICT competencies in the integration of ICT in instructional delivery in public secondary school in Bayelsa State?
3. Find out the factors inhibiting adequate training of teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State.

Research Questions

1. What are the kinds of ICT development training acquired by teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State?
2. To what extent does teacher apply ICT competencies in the integration of ICT in instructional delivery in public secondary school in Bayelsa State?
3. What are the factors inhibiting adequate training of teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State?

Hypothesis

The following null hypotheses will be tested at0.05 significant level:

1. There is no significant difference between the mean ratings of male and female teachers on factors inhibiting adequate training of teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State.

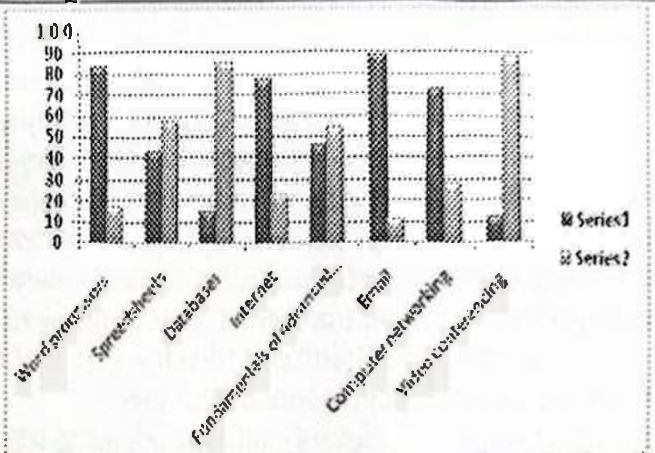
Methodology

The design of the study is descriptive survey design and the population of the study is 3514 teachers in all the public secondary schools in Bayelsa State. Among this number, 1865 are male while 1649 are female. Through a stratified random sampling technique; a sample of 454 teachers whose gender distribution were 211 male and 243were female were randomly selected. The sample size of 359 was determined through the Taro Yamane Formulae of 1967. Among the sample, 169(47%) were male teachers while 190(53%) were female teachers. The instrument for data collection was a self-designed instrument captioned "Identification of ICT Needs for Teachers Development Questionnaire (IINTDQ)". The questionnaire was rated according to the modified Likert scale of Very High Extent (VHE)-4, High Extent (HE)-3, Low Extent (LE)-2, Very Low Extent (VLE)-1. The reliability coefficient of the instrument was 0.88 which was determined through the Cronbach alpha statistics. The entire 359 instrument were administered and retrieved immediately to ensure high retrieval rate. In analyzing the data, simple percentage was used to answer the research question 1, while mean score and standard deviation was used to answer research question two 2 and 3. The hypotheses were analysed using z-test.

Result

Research Question 1: What are the kinds of ICT development training acquired by teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State?

SN	Kinds of ICT Development Training	Acquired (%)	Not Acquired (%)
1.	Word processors	83	17
2.	Spreadsheets	43	57
3.	Databases	15	85
4.	Internet	77	23
5.	Fundamentals of advanced search	46	54
6.	Email	89	11
7.	Computer networking	72	28
8.	Videoconferencing	12	88



Based on the chart, it can be seen that the respondents indicated that the sampled teachers have acquired ICT development training in terms of word processing. This is against the 17% of teachers who has not acquired this ICT development training as it relates to word processing. This implies however, that more teachers in the school system have knowledge of operating the word processors. This is seconded after an indication of teachers showing that they have acquired competencies to sending receiving of emails which stands at 89% against those who has not acquired this training which stands at 11%. The table and chart shows that 77% of teachers have acquired training on how to use the internet as against the 23% of teachers. This implies that more teachers can use the internet. Also, 72% of teachers indicated that they have acquired training on computer networking as against the 28% who has not acquired this training. However, other training skills below 50% is considered not acquired and hence does not reflect integration of ICT in instructional delivery in public secondary school in Bayelsa State.

Research Question 2: To what extent does teacher apply ICT competencies in the integration of ICT in instructional delivery in public secondary school in Bayelsa State?

Item Statement	Male (160) $\bar{X}_2$	SD	Female (190) $\bar{X}_1$	SD	Mean Set $\overline{xx}$	Remark
9. I use word processor to finish and finally complete all of my written interactions with both my colleagues and student.	2.15	0.94	2.40	0.84	2.27	Very Low Extent
10. I use spreadsheet in keeping track of students' grades and presenting them in a visually appealing way	2.1	0.87	2.11	0.89	2.10	Very Low Extent
11. I network computers to enable me share information with students and my colleagues.	2.0	0.92	2.24	0.94	2.12	Very Low Extent
12. I perform electronic presentation in the classroom during instructional time.	2.03	0.83	2.04	0.89	2.03	Very Low Extent
13. I send emails to my students as a fellow up for classroom activities	2.0	0.96	2.16	0.99	2.08	Very Low Extent
Grand Mean/SD	**2.05**	**0.90**	**2.19**	**0.91**	**2.12**	**Very Low Extent**

Table 2 shows the extent teacher apply ICT competencies in the integration of ICT in instructional delivery in public secondary school in Bayelsa State. From the mean score of 2.12 which is far below the mean criterion of 2.5, thus it shows that to a very lower extent teacher applies ICT instructional delivery. On the same table, item number 9 indicates a mean score of 2.27 which indicates that to a very low extent teachers use word processor to finish and finally complete all of my written interactions with both my colleagues and student. Still on the same table, item number 10 has a 2.10 which is far less than the mean criterion of 2.5, hence indicating that to a very low extent teachers use spreadsheets keeping track of students' grades and presenting them in a visually appealing way. Item number 11 shows a mean of 2.12 which also revealed that to a very low extent; teacher network computers to enable me share information with students and my colleagues Item number 12 has a mean of 2.03 which is less than the criterion mean of 2.5, hence it submitted therefore that teachers perform electronic presentation in the classroom during instructional time. Finally, item number 13 shows a mean score of 2.08 which less than the criterion mean of 2.5 which indicates that to a very low extent teachers sen emails to my students as a fellow up for classroom activities.

Research Question 3: What are the factors inhibiting adequate training of teachers fo the integration of ICT in instructional delivery in public secondary school in Bayels State?

	Item Statement	Male (169) $\bar{x}_2$	Sd_2	Female (190) $\bar{x}_1$	Sd_1	Mean Set $\overline{xx}$	Remark
14.	There is shortage of power supply, hence I cannot apply my ICT skills.	2.17	0.88	2.15	0.86	2.16	Not Agreed
15.	There is absence of ICT facilities in the school.	2.34	0.89	2.65	0.80	2.49	Not Agreed
16.	I lack technical skills to operate ICT facilities.	2.05	0.96	2.07	0.84	2.06	Not Agreed
17.	There is generally no adequate funding of education.	2.50	0.89	2.56	0.89	2.53	Agreed
18.	There is high cost of internet data which is not covered by my remuneration.	2.13	0.98	2.16	0.93	2.14	Not Agreed
	Grand Mean/SD	2.24	0.92	2.30	0.86	2.27	Not Agreed

Table number 3 shows the mean and standard deviation on the factors inhibiti adequate training of teachers for the integration of ICT in instructional delivery in publ secondary school in Bayelsa State. Based on the mean set of 2.27, it therefore shows th shortage of power supply (2.16), absence of ICT facilities (2.49), lack technical skills operate ICT facilities (2.06), high cost of internet data (2.14) are not factors inhibitir adequate training of teachers for the integration of ICT in instructional delivery in publ secondary school in Bayelsa State. However, only item number 17 with mean of 2.5 which indicates that the factors inhibiting adequate training of teachers for th integration of ICT in instructional delivery in public secondary school in Bayelsa State inadequate funding of education.

Test of Hypotheses

Hypotheses: There is no significant difference between the mean ratings of male an female teachers on factors inhibiting adequate training of teachers for the integration o ICT in instructional delivery in public secondary school in Bayelsa State.

Table 4: Mean score, standard deviation and z-test of the difference between the mean ratings of male and female teachers on factors inhibiting adequate training of teacher for the integration of ICT in instructional delivery in public secondary school in Bayels State.

Variables	N	Df	Mean	SD	Z-cal.	Z-crit.	Decision
Male	169	357	2.24	0.92	-0.72	±1.96	Accepted
Female	190		2.30	0.86			

Table 4 shows a mean score, standard deviation and z-test of the difference between the mean ratings of male and female teachers on factors inhibiting adequate training of teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State. The table shows a degree of freedom standing at 357 with a z-cal determined at -0.72 which is greater than the z-critical of ±1.96 and this indicates that the null hypothesis stating there is no significant difference between the mean ratings of male and female teachers on factors inhibiting adequate training of teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State is accepted. The implication of this that the male and female teacher has same opinion on factors inhibiting adequate training of teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State.

Discussion of Findings

The study revealed that to a very low extent, teacher applies ICT competencies in the integration of ICT in instructional delivery in public secondary school in Bayelsa State. The study also discovered among others that to a very low extent teachers use word processor lo finish. The study found out that to a very low extent, teachers network computers to enable me share information with students and my colleagues. The study further revealed that teachers perform electronic presentation in the classroom during instructional time. Finally, the study also revealed that to very low extent teachers send emails to my students as a fellow up for dassroom activities. These findings are in consonance with the opinion of Owolabi (2013), Ioryem, et al., (2017), and Ekwelem, (2019).

The study reveal that shortage of power supply, absence of ICT facilities, lack technical skills to operate ICT facilities, high cost of internet data did not constitute the factors inhibiting adequate training of teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State. However, the study revealed that generally, no adequate funding of education constitute the factors inhibiting adequate training of teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State. This mean that both male and female teachers have same opinion on the on factors inhibiting adequate training of teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State. This findings are in line with the findings of Vasslios (2012), Sunday (2015) and Daramola (2016).

Conclusion

ICT stands for information and communication technology. "Technology" is the century's tagline. It was concluded that that to a very low extent, teacher applies ICT competencies in the integration of ICT in instructional delivery in public secondary school in Bayelsa State. The study also discovered among others that to a very low extent teachers use word processor to in the teaching service delivery. It further concluded that to a very low extent, teacher's network computers to enable them share information with students and my colleagues as a mean of integrating ICT instructional delivery. The

study reveal that shortage of power supply, absence of ICT facilities, lack technical skills to operate ICT facilities, high cost of internet data did not constitute the factors inhibiting adequate training of teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State.

Recommendations

Based on the conclusion, the following recommendations were handed down:

1. The government and the school boards should liaise with private institutions that are very competent to train and retain teachers in Microsoft word, computer networking, email utlisation, spread sheet, data processing, video conferencing, graphic designing, and advance excel in public secondary school in Bayelsa State.
2. The government should encourage teachers to enroll on ICT training by professional and also fund the training to ensure teachers ICT competencies in the integration of ICT in instructional delivery in public secondary school in Bayelsa State.
3. The government, teacher, and principals should work to address the factors inhibiting adequate training of teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State, by mapping out solutions that would ensure teachers practical application of ICT in the classroom.

References

Abdulrahman, B.A. & Habila, L. (2017). Library and information science education and the challenges of ICT In a depressed society. *Research Journal of Library and Information Science, 1*(1), 25-30.

Adomi, E.E. (2015). Information provision st and use in the 21 century. *Delta Library Journal, 9*(1&2),1-7.

Akele, F. E. (2013). Information and communication technology as teaching and learning space for teachers of english language in schools. *Information and Communication Technology as TeJournal of Emerging Trends in Educational Research and Policy Studies, 5*(1), 100.

Amin, S. N. (2013). An effective use of ict for education and learning by drawing on worldwide knowledge. *Research and Experience,* 1-13.

Angadi, G. R. (2014). An effective use of ICT is a change agent for education. *International Interdisciplinary Research Journal, 4*, 526-528.

Bindu, C. N. (2016). Impact of ICT on teaching and learning: A Literature Review. *International Journal of Management and Commerce Innovations, 4*(1),24-31.

Buabeng-Andoh, C. (2019). Factors that influence teachers' pedagogical use of ICT in secondary Schools. *Contemporary educational technology, 10*(3),272-288.

Comi, S. L., Argentin, G., Gui, M., Origo, F., & Pagani, L. (2017). Is it the way they use it? teachers, ICT and student achievement. *Econ. Educ. Rev.* 56, 24–39. doi 10.1016/j.econedurev.2016.11.007

Daramola, C.F. (2016). Perception and utilization of electronic resources by undergraduates: the Case of Federal University Technology Library, Akure.

American Journal of Educational Research, *4*(5), 366-370. http://pubs.sciepub.com/educati

Ekwelem, C.N. (2019). Information Communication Technology (ICT) and the future of library: A review of related literature. Library Philosophy and practice (e-journal). https://digitalcommons.unl.edu/libphil prac/2232

Fong, R. W. H. & Tony, H. (2011). *A study of teachers' beliefs and practices of using Information and Communication Technology (Ict) in classrooms science education in international contexts 2011*, III, 143-158, DOI: 10.1007/978-94-6091-427-0_11

Ioryem, T.N., Sambe, M.T. & Agyo, E. (2017). Library education in Nigeria and the challenges of Information and Communication Technology in a globally depressed economy. *Benue State University Journal of Education, 17*(3), 162-168.

Makrakis, Vassilios (2011). *Reorienting teacher education to address sustainable development through wikiquesd.* Research on e-Learning and ICT in Education 2012, Part 2, 83-94, hppt://DOI: 10.1007/978-1-4614-1083-6_7

Ottong, E.J. (2014). *The study of library and information science: a conceptual approach.* University of Calabar Printing Press.

Owolabi, T. O., Oyewole, B. K., & Oke, J. O. (2013). Teacher education, information and communication technology: Prospects and challenges of E-Teaching profession in Nigeria. *American Journal of Humanities and Social Sciences, 1*(2),87–91. https://doi.org/10.11634/232907811301314

Owolabi, T. O., Oyewole, B. K., & Oke, J. O. (2013). Teacher education, information and communication technology: Prospects and challenges of e-teaching profession in Nigeria. *American Journal of Humanities and Social Sciences, 1*(2),87–91.

Ramírez, M.S., Mena, J., & Rodríguez, J.A.(2017). In-service teachers' self-perceptions of digital competence and OER use as determined by a xMOOC training course. *Computers in Human Behavior, 77*,356-364

Rohatgi, A., Scherer, R., & Hatlevik, O.(2016). The role of ICT selfefficacy for students' ICT use and their achievement in a computer and information literacy test. Computers &Education, 102, 103-116.

Sinha, S., & Lamba, S. (2016). Role of ICT in higher education. *Anusandhaan - Vigyaan Shodh Patrika, 4*(1),2810–2813.https://doi.org/10.22445/avsp.v4il.4397

Sunday, A. F. (2015). Effective teaching with ICT in Nigerian higher institutions: A solution to graduate employability. *Journal of Educational Review, 8*(3), 231–239

Todaro, M.P. & Smith, S.C. (2006) Economic Development. 8th Edition, Addison-Wesley, Reading.

Toyo, O. D. (2017). Information and Communication Technology (ICT) Adoption and the Educational Growth of Colleges of Education in Agbor and Warri, Delta State, Nigeria. *International Journal of Education and Evaluation, 3*(7), 19–32

Va sslios, M. (2012). *ICT in Education for sustainable Development.* UNESCO ICT in Education, news letter

study reveal that shortage of power supply, absence of ICT facilities, lack technical skill to operate ICT facilities, high cost of internet data did not constitute the factors inhibiting adequate training of teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State.

Recommendations

Based on the conclusion, the following recommendations were handed down:

1. The government and the school boards should liaise with private institution that are very competent to train and retain teachers in Microsoft word, computer networking, email utlisation, spread sheet, data processing, video conferencing, graphic designing, and advance excel in public secondary school in Bayelsa State.
2. The government should encourage teachers to enroll on ICT training to professional and also fund the training to ensure teachers ICT competencies in the integration of ICT in instructional delivery in public secondary school in Bayelsa State.
3. The government, teacher, and principals should work to address the factors inhibiting adequate training of teachers for the integration of ICT in instructional delivery in public secondary school in Bayelsa State, by mapping out solutions that would ensure teachers practical application of ICT in the classroom.

References

Abdulrahman, B.A. & Habila, L. (2017). Library and information science education and the challenges of ICT In a depressed society. *Research Journal of Library and Information Science, 1*(1),25-30.

Adomi, E.E. (2015). Information provision st and use in the 21 century. *Delta Library Journal, 9*(1&2),1-7.

Akele, F. E. (2013). Information and communication technology as teaching and learning space for teachers of english language in schools. *Information and Communication Technology as TeJournal of Emerging Trends in Education Research and Policy Studies. 5*(1), 100.

Amin, S. N. (2013). An effective use of ict for education and learning by drawing on worldwide knowledge. *Research and Experience,* 1-13.

Angadi, G. R. (2014). An effective use of ICT is a change agent for education. *International Interdisciplinary Research Journal, 4*, 526-528.

Bindu, C. N. (2016). Impact of ICT on teaching and learning: A Literature Review. *International Journal of Management and Commerce Innovations, 4*(1),24-31.

Buabeng-Andoh, C. (2019). Factors that influence teachers' pedagogical use of ICT in secondary Schools. *Contemporary educational technology, 10*(3), 272-288.

Comi, S. L., Argentin, G., Gui, M., Origo, F., & Pagani, L. (2017). Is it the way they use it? teachers, ICT and student achievement. *Econ. Educ. Rev.* 56, 24–39. doi 10.1016/j.econedurev.2016.11.007

Daramola, C.F. (2016). Perception and utilization of electronic resources by undergraduates: the Case of Federal University Technology Library, Akure.

American Journal of Educational Research, 4(5), 366-370. http://pubs.sciepub.com/educati

Ekwelem, C.N. (2019). Information Communication Technology (ICT) and the future of library: A review of related literature. Library Philosophy and practice (e-journal). https://digitalcommons.unl.edu/libphil prac/2232

Fong, R. W. H. & Tony, H. (2011). *A study of teachers' beliefs and practices of using Information and Communication Technology (Ict) in classrooms science education in international contexts 2011*, III, 143-158, DOI: 10.1007/978-94-6091-427-0_11

Ioryem, T.N., Sambe, M.T. & Agyo, E. (2017). Library education in Nigeria and the challenges of Information and Communication Technology in a globally depressed economy. *Benue State University Journal of Education, 17*(3), 162-168.

Makrakis, Vassilios (2011). *Reorienting teacher education to address sustainable development through wikiquesd.* Research on e-Learning and ICT in Education 2012, Part 2, 83-94, hppt://DOI: 10.1007/978-1-4614-1083-6_7

Ottong, E.J. (2014). *The study of library and information science: a conceptual approach.* University of Calabar Printing Press.

Owolabi, T. O., Oyewole, B. K., & Oke, J. O. (2013). Teacher education, information and communication technology: Prospects and challenges of E-Teaching profession in Nigeria. *American Journal of Humanities and Social Sciences, 1*(2), 87–91. https://doi.org/10.11634/232907811301314

Owolabi, T. O., Oyewole, B. K., & Oke, J. O. (2013). Teacher education, information and communication technology: Prospects and challenges of e-teaching profession in Nigeria. *American Journal of Humanities and Social Sciences, 1*(2), 87–91.

Ramírez, M.S., Mena, J., & Rodríguez, J.A.(2017). In-service teachers' self-perceptions of digital competence and OER use as determined by a xMOOC training course. *Computers in Human Behavior, 77*,356-364

Rohatgi, A., Scherer, R., & Hatlevik, O.(2016). The role of ICT self efficacy for students' ICT use and their achievement in a computer and information literacy test. Computers &Education, 102, 103-116.

Sinha, S., & Lamba, S.(2016). Role of ICT in higher education. *Anusandhaan- Vigyaan Shodh Patrika, 4*(1), 2810–2813.https://doi.org/10.22445/avsp.v4i1.4397

Sunday, A. F. (2015). Effective teaching with ICT in Nigerian higher institutions: A solution to graduate employability. *Journal of Educational Review, 8*(3), 231–239

[illegible]ro, M.P. & Smith, S.C. (2006) Economic Development. 8th Edition, Addison-Wesley, Reading.

[illegible], O. D. (2017). Information and Communication Technology (ICT) Adoption and the Educational Growth of Colleges of Education in Agbor and Warri , Delta State , Nigeria. *International Journal of Education and Evaluation, 3*(7), 19–32

Vasslios, M. (2012). *ICT in Education for sustainable Development.* UNESCO ICT in Education, news letter