

Readiness Factors and the Integration of Information and Communication Technologies (ICTs) into Basic Schools in Ogoja Education Zone of Cross River State, Nigeria

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Abstract

The study investigated the relationship between teachers' competence, the availability of ICT facilities and infrastructure, and the integration of Information and Communication Technologies (ICTs) into basic schools in Ogoja Education Zone, Cross River State, Nigeria. Two null hypotheses were formulated to guide the study. A correlational research design was employed. Data was collected from 535 respondents employing a questionnaire. The data was analysed using the Pearson Product Moment Correlation technique. Findings revealed a positive relationship between teachers' competence, the availability of ICT facilities and infrastructure, and the integration of ICTs in Basic Education. Consequently, it was concluded that teachers' competence and availability of facilities and infrastructure, which are lacking in basic schools in the study area, are components for effective integration of ICT into the teaching/learning process at the basic level of education. It was recommended that teachers should be trained and that ICT facilities and infrastructure provision should be made a priority for effective integration of ICTs in Basic Education.

Keywords: readiness, factors, integration, information, communication

Introduction

With the multiple literacy requirements of the 21st-century environment comes the urgent demand for competencies and for the acquisition of 21st-century skills needed for survival.

This also brings to focus the need to become self-reliant outside the school and to be globally competitive with the ability to function effectively across local and international boundaries. With globalization, it has become necessary that people should acquire a high standard of education that will make learners cope and adapt to the changing world. With this, the traditional and prevalent system of education that dominated the 19th and 20th centuries is seen to be rapidly giving way to the new ideals of the 21st century. Information and Communication Technology (ICT) remains the vehicle for the transmission of these new ideals.

The various kinds of Information and Communication Technology (ICT) products available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counselling, interactive voice response system, audiocassettes, and CD ROMs are used for different purposes (Sharma, 2003). Information and Communication Technology (ICT) is a conventional way of facilitating information electronically via processing, transmission, and display. It is also referred to as the handling and processing of information (text, images, graphics, instructions, and others) for use, through electronic and communication devices such as computers, cameras, and telephones (Sharma, 2003; Ozoji in Jimoh, 2007). The combination of Information and Communication Technology (ICT) with the internet, initiates a channel for students to acquire a vast human experience and guides students to enter the global community. The use of ICT in education is necessary for effective handling of the rapid knowledge explosion which has become the order of the day.

According to Yusuf (2005), ICTs have the potential to accelerate, enrich, and deepen skills to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers as well as strengthen teaching and bringing change to schools. The use of Information and Communication Technology (ICT) which brings about a powerful learning environment and transforms the learning and teaching process, aids students in dealing with knowledge in an active, self-directed, and constructive way (Volman & Van Eck, 2001). Thus, ICTs are not only considered as a tool, which can be added to existing teaching methods but is seen as an important instrument to support new ways of the teaching-learning process. ICT is a versatile tool that promotes teaching and learning in a school environment. It has initiated a global paradigm shift from a natural resource-based economy to that of knowledge-based resources for generating wealth. Education is the only resource that can help to transform not only the present state of a nation's economy in line with the new paradigm but also that of the future.

In Wang and Woo (2007) opinion, ICT can be hardware (such as computers, digital cameras), software (such as Excel, discussion forums), or both. In the educational context, it mainly refers to various resources and tools (software) presented on the computer. ICT is not particularly reserved for education. The common point in the ICT definition is that it is a tool to realize learning objectives (Koçak-Usluel et al., 2007). Aribisola (2006) noted that ICT infrastructure is increasingly playing an important role in organizations and is heralded as the instrument for the post-industrial age and foundation for a knowledge economy due to its ability to facilitate the transfer and acquisition of knowledge. Quek et al. (2007) pointed out that technology can play a part in supporting face-to-face teaching and learning in the classroom with the availability of hardware such as computers, printers, scanners, and others.

Many researchers assert that the use of computers and other hardware can help students to become knowledgeable, and faster, reduce the amount of direct instruction given to them, and allow teachers to help those students with needs (Iding et al., 2002; Samantha et al., 2004). According to Gillespie (2006), new technologies can be used in primary science education to enable students to collect science information and interact with resources, such as scanning to produce images, using webcams for videos and to encourage communication and collaboration.

For standards to be maintained in the education of any nation, a global information society has been pin-pointed as a feasible instrument for uplift. Consequently, it is pertinent for the education given to children, especially at the elementary level, to be administered in a way that equips them for a knowledge-based economy. This makes the integration of Information and Communication Technologies (ICTs) into the education of children, a matter of necessity. According to Wang and Woo (2007), ICT integration is defined as a process of using any ICT (including information resources on the web, multimedia programmes in CD-ROMs, learning objects, or other tools) to enhance students' learning. Also, Bamidele (2006) stated that advancement in ICT has influenced the globalization of various aspects of man's life. This has extremely altered or affected the objectives of education. This shift in objectives, therefore, implies a shift in the way teachers teach and they must fully fit in and adapt to the use of ICT.

To reap the full benefits of the use of Information and Communication Technologies (ICTs) by a society and possibly for the future of education, depends to a great extent, on its integration in schools, which is necessary for the improvement of quality in teaching and learning. Unfortunately, the application and utilization of these tools are still low in

most schools, and thus, most teaching-learning institutions still lack a general theoretical framework for its integration into basic education. Integration means unification into a whole. Integration of ICTs is not a product but a process. It means using ICTs effectively and efficiently in all dimensions of the processes including the necessary infrastructure, teaching programmes, and teaching-learning environments. Researchers identified many barriers affecting ICTs integration process (Pelgrum, 2001; Ertmer, 2005, Pelgrum & Law, 2003; Hew & Brush, 2007).

The successful integration of ICTs into the teaching-learning process is highly dependent on the readiness of certain factors. Beginning with the teachers, ICTs integration requires their readiness. If teachers are expected to integrate ICTs into the school curriculum, readiness must be seen at the pre-service teacher education level. Teacher preparation programmes will be seen focusing on the need for student-teachers to have ICT skills for, not only their use in the preparation of materials for teaching and learning activities but also to facilitate the direct use in students' learning activities within the classroom situation and develop in their students a critical awareness of ICTs applications and the social implications.

Teachers' competence is not controversial but crucial in the precept of development, enhancement, and impartation of knowledge in Information and Communication Technologies (ICTs). However, Yusuf (2005) maintained that teachers in Nigerian secondary schools are not competent in basic computer operations and in the use of generic software. Ijeoma et al. (2010) reported that Information and Communication Technologies (ICTs) utility enhances human capacity in every field, including business operations, industrial processes, educational programmes, and general life activities. The researchers' investigation on ICT competence among academic staff in universities in Cross River State, Nigeria, revealed that a greater part of the academic staff was self-finance ICT trained; increased number of their laptops; gained access to the internet at public cyber-café; and majority (53.3%) rated their ICT competence as low. Insufficient ICT facilities, excess workload, and financing were discovered as serious problems to ICT utilization by academic staff. Bhebbe and Maphosa (2020) reported that some schools are far from enhancing teaching and learning by integrating ICTs due to a lack of infrastructural facilities for effective teaching and learning.

The 21st-century environment is characterized by learner-centred and inquiry-based teaching and learning. Students, cutting across all levels, nowadays almost live digitally and daily make use of phones, computers, the internet, social networks, and others and are

very fluid at operating and using them to find and circulate information. Consequently, teachers need to acquire skills in using and applying ICTs to connect with today's learners. Being globally aware in terms of education will translate to renewing the curriculum on a regular basis considering new competencies, individualized learning, greatly reduced class sizes, inquiry method of learning, problem-solving and students' centred approaches, use of internet and electronic facilities to support teaching and learning (Peretomode & Ikoya, 2010).

Badau and Sakiyo (2013) conducted a study by assessing the competence of ICT of rural and urban secondary school ICT teachers for the implementation of ICT curriculum in Northeastern Nigeria. Data was analysed through mean, standard deviation, and percentage. Results reveal that the competence of ICT teachers in policy, curriculum, pedagogy, technology, administration, and professional development was low. Obstacles to ICT teacher's competencies were identified as lack of hardware, software, and financial resources, lack of electricity in most rural schools, and insufficient information and experience of teachers in ICT applications.

Krumsvik (2008) emphasized that specific competence, besides ordinary technology competence, is required from teachers because the focus of their work is on education and instruction. The author defined teachers' ICT competence as a teacher's proficiency in using ICT in a professional context with good pedagogic-didactic judgment and his or her awareness of its implications for learning strategies. Kabakci (2009) proposed a framework for developing teachers' ICT resources competence. The framework was built on a stage-based model introduced by Zhao and Cziko (2001) presenting teachers and technology use according to the following four stages: Survival stage, Mastery stage, Impact stage, and Innovation stage. Kabakci (2009) proposed that the most important aspect of the framework is that teachers should participate in professional development programmes according to the stages of technology use, and media resources-related activities should be realized under each teacher's current stage of ICT use. Also, Bingcag (2015) found that there was a positive correlation between ICT competence and utilization of ICT in teaching and learning situations.

In a review of several research publications modelling the ICT competency areas for teachers, Sabaliauskas et al. (2006) constructed the following list of areas included in teacher ICT competencies: basic ICT competencies; Technological ICT competencies; ICT policy competencies; competencies in the ethical areas of ICT use; Competencies of ICT; The integration into the teaching subject; competencies of didactical methods based

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on the use of ICT; and competencies of managing teaching/learning process working with ICT. Also, Emmanuel and Adelabu (2015) observed, after examining the influence of teacher competence and availability of e-learning resources in secondary schools in Oyo Northern Senatorial District, that teachers had low-level competence in utilization of ICT and this impacted negatively on their teaching ability.

A great number of serving teachers tend not to be equipped with basic computer operational skills, which calls for their retraining with education curriculum relevant for the contemporary knowledge age. Yusuf and Balogun (2011) reported that teachers in Nigerian secondary schools are not competent in basic computer operation and in the use of generic software even though they have a positive attitude towards the use of computers. The findings of their study revealed a low level of ICT penetration in the Nigerian school system. Lakkala et al. (2011) reiterated that there is a double dimension in teachers' competence: they are role models for students' use of ICT resources, and they must make educational decisions about how ICT resources may enhance their learning possibilities, in addition to using ICT resources for personal purposes.

Experience has shown that in most Nigerian schools, ICT facilities are either not there at all, or are dilapidated or not properly utilized by the personnel in charge, thus, reducing the life span of such facilities (Jimoh et al., 2017). Amuchie (2015) carried out a study to ascertain the various Information and Communication Technology resources available for teaching and learning in the Secondary Schools in two local government areas in Ardo Kola and Jalingo, all in Taraba state. A sample of 264 respondents was selected from the population of secondary school teachers and principals in forty secondary schools in the study area using a stratified random sampling technique. The instrument used for the collection of data was a set of researcher-made questionnaire. Data collected was analyzed using frequency counts and simple percentages. The results show that the extent of availability of ICT resources in secondary schools in Ardokola and Jalingo is very low; the extent of utilization of ICT resources in teaching and learning is equally very low; ICT resources were not available in the schools for the use of teachers and students for learning activities; poor power supply, high cost of computers and accessories among others were factors constraining the use of ICT in secondary schools.

An investigation on the level of availability and use of ICT in some Southwestern Nigerian Colleges of Education was carried out by Tella (2011). The data for the study were gathered through a questionnaire administered to 200 respondents who were accessible in the School of Education in all the Colleges of Education in the South-Western part of

Nigeria. In total, 180 copies of the questionnaire were retrieved which represents a 90% return rate. The data were analyzed quantitatively using SPSS. The results of the study revealed a low level of usage of ICT attributed to the non-availability of some ICT gadgets and equipment. Tella's research was focused on Colleges of Education. The present study is, however, focused on basic schools. Ajayi and Ekundayo (2009), who after carrying out a descriptive survey on the integration of ICT in Nigerian secondary schools, found that ICT facilities were lacking in schools, making it difficult to adopt and integrate ICT into the teaching and learning process.

Ezeuwa (2014) conducted a study aimed at ascertaining the availability and extent of utilization of ICT facilities for effective management of education in Ebonyi State public secondary schools. The entire population of 290 respondents drawn from the 145 public secondary schools in the state was used for the study as there was no sampling. A Checklist on the Availability of ICT facilities (CAIF) and a Questionnaire on the Extent of Utilization of ICT Facilities (QEUIF) were the instruments used for data collection. Data collected were analyzed using simple percentages, mean, and standard deviation. It was found that ICT facilities were available in Ebonyi State public secondary schools but bedeviled by low utilization.

In most cases, teachers who are supposed to use ICTs in delivering instruction to pupils lack the competence to do so. This situation has affected the ability of students and teachers to excel in the use of these ICTs, which are fast becoming part of daily living. Also, ICT facilities are found lacking in basic schools for the incorporation of the tools. Owing to the importance of ICT in the world of today, there is a need to find out the extent of readiness of schools towards the integration of ICT into the teaching/learning process, especially at basic schools, for the effective absorption of the products of educational institutions into the digital society of today. The question is, if utilization of ICT tools is almost totally absent in schools, what are those factors that have contributed to this challenge? This study sought to examine the factors of teacher competence in the use of ICT tools and the availability of ICT facilities and infrastructure concerning the integration of ICTs into Basic Education in Ogoja Education Zone of Cross River State, Nigeria.

Hypotheses

Two hypotheses were formulated to direct the study:

Ho1: There is no significant relationship between teacher competence and the integration of Information and Communication Technologies (ICTs) into basic education.

Ho2: There is no significant relationship between the availability of hardware in schools and the integration of Information and Communication Technologies (ICTs) into basic education.

Methodology

The design used for the study is correlational. The use of this design is predicated on the fact that it seeks to establish the relationship between the independent variables of teacher competence and availability of hardware and the dependent variable of integration in basic education. The area of this study is Ogoja Education Zone of Cross River State, Nigeria. The zone is situated in the Northern Senatorial District of the state. It shares boundary with Benue State to the North, Boki Local Government Area of Ikom Education Zone to the South, the Cameroon Republic to the East, and Ebonyi State to the West. Its geographic coordinates are between latitudes 5° 32' and 4° 27' North and longitudes 7° 50' and 9°28' East. It has an area of 306 Square Kilometers (118 sq mi). According to the National Population Commission (2015), the zone has a projected population of 1,044,056 people which implies 526,266 males and 517,790 females. It consists of five (5) Local Government Areas: Bekwarra, Obanliku, Obudu, Ogoja, and Yala. Majority of the older people in the study area are illiterates. But the younger ones are educated. This could be attributed to the many schools at various levels, distributed in the study area. There is one state university campus (Cross River University of Technology-CRUTECH) in Ogoja, the Federal College of Education, Obudu, the Private School of Nursing, Bekwara, several secondary and primary schools located in the area.

The population of the study comprised all teachers in basic education schools in Ogoja Education Zone of Cross River State. The total number of teachers from the zone amounted to five thousand, three hundred and fifty-three (5,353) from four hundred and twenty-nine (429) basic schools (State Universal Basic Education Board, Calabar, 2017/2018). To sample respondents for the study, the researchers employed a multi-faceted strategy. The stratified sampling technique was used to select primary schools based on the number of local government areas in the zone. Then the proportional stratified sampling was used to balance up the proportions from the sub-groups. The basis for proportional sampling is that for each local government area, the proportion of the sample selected reflects the total number of teachers.

The simple random sampling technique was then used to sample five hundred and thirty-five (535) teachers for the study. This figure represents 10% of the population (5,353) of the study. The sample was selected from 30 schools being 7% of the total number of

schools in the zone. Table 1 shows a summary of the distribution of the population and sample of the study.

Table 1: Distribution of population and sample of schools and teachers selected for the study

S/N	LGA	Total No. of Schools	No. of Schools Selected (7%)	No. of Teachers	Sample selected (10%)
1.	Obudu	66	5	1094	109
2.	Obanliku	78	6	975	98
3.	Bekwarra	61	4	851	85
4.	Ogoja	91	6	1369	137
5.	Yala	133	9	1064	106
	TOTAL	429	30	5,353	535

The instrument for data collection was a questionnaire named: Readiness Factors and Integration of Information and Communication Technologies (ICTs) into Basic Education Questionnaire (RFIICTQ). The questionnaire was divided into two sections. Section ‘A’ was designed to collect the respondents’ demographic data such as sex and LGA. Section B contained thirty-six (36) items structured along a four-point Likert-type scale, designed to measure teachers’ competence, availability of hardware, and ICTs integration into basic education. Each item required the respondents to indicate the degree of their opinion under “Strongly Agree” (SA), “Agree” (A), “Disagree” (D), and “Strongly Disagree” (SD).

Experts in Educational Statistics, Measurement and Evaluation from the University of Calabar, were used to establish face validity. There were forty items proposed but at the end of the validity exercise, they were pruned to thirty-six. The reliability of the questionnaire was determined using test-retest administration. The reliability was carried out using 25 teachers drawn from the study area but outside the sample of the study. The questionnaire was administered to the teachers, and after a two-week interval, it was re-administered to the same teachers. The reliability coefficient was calculated using Pearson Product Moment Correlation. The result is presented in table 2. Data were collected with the use of a questionnaire. The information obtained from the respondents was treated with utmost confidentiality and used solely for the research.

Table 2: Reliability of the instrument

S/N	Variables	N	No. of Items	No. of Administrations	\bar{x}	SD	Reliability Coefficient
1.	Level of competence	25	6	1 st	12.76	3.26	0.79
			6	2 nd	9.40	3.08	
2.	Availability of hardware	25	6	1 st	13.80	4.60	0.68
			6	2 nd	11.72	4.88	
3.	Integration of ICT into basic schools	25	6	1 st	13.04	4.22	0.82
			6	2 nd	11.24	4.09	
Reliability coefficient for all variables							0.77

Presentation of results

Ho1: There is no significant relationship between teachers' competence and integration of Information and Communication Technology into basic education.

Hypothesis one sought to investigate the relationship between teachers' competence and the integration of information and communication technologies in basic education. The independent variable of the hypothesis is teachers' competence while the dependent variable is integration of information and communication technologies in basic education. Data were analyzed using Pearson Product Moment Correlation and the results are shown in table 3.

Result of data analysis in table 3 revealed that the calculated r value of ($r = 0.894$) is greater than the critical r value at 0.05 level of significance. This means that there is a strong relationship between teachers' competence and the integration of ICTs in basic education. Therefore, the null hypothesis is rejected at 0.05 level of significance and the alternate hypothesis is accepted. Thus, there is a significant relationship between teachers' competence and integration of ICTs in basic education. Invariably, teachers' competence is required if ICTs integration into basic education would be achieved in Ogoja Education Zone.

Table 3: Pearson Product Moment Correlation Analysis of relationship between teachers' competence and integration of ICT in basic education (N = 535).

Variable	Σx	Σx^2	Σxy	R
	Σy	Σy^2		
Teachers' competence	8435	155199		
Integration of ICT into basic education	5776	66102	91014	0.894

*Significant at 0.05; df – 533; critical r = 0.138.

Ho2: There is no significant relationship between the availability of ICT facilities and infrastructure and the integration of ICT into basic education.

Hypothesis two sought to find out if there is any relationship between the availability of ICT facilities and infrastructure and the integration of Information and Communication Technologies into basic education. The independent variable of the hypothesis is the availability of ICT facilities and infrastructure, while the dependent variable is the integration of Information and Communication Technologies (ICT) into basic education. Data were analyzed using Pearson Product Moment Correlation. The result of the analysis is presented in Table 4.

The results of data analysis in table 4 revealed that the calculated r-value of 0.931 is greater than the critical r-value. This means that there is a positive relationship between the availability of ICT facilities and infrastructure and the integration of ICT into basic education. Therefore, the null hypothesis is rejected at 0.05 level of significance, and the alternate hypothesis is accepted thus: There is a significant relationship between the availability of ICT facilities and infrastructure and the integration of ICT into basic education. This means that the integration of ICTs into basic education is predicated on the availability of ICT facilities and infrastructure. The positive relationship shows that the unavailability of these ICT facilities and infrastructure will mean the absence of ICT integration in basic education.

Table 4: Pearson product-moment correlation analysis of the relationship between the availability of ICT facilities and integration of ICT in Basic Education (N = 535).

Variable	Σx Σy	Σx^2 Σy^2	Σxy	r
Availability of ICT facilities and infrastructure	11043	230609	119390	0.931
Integration of ICT into basic education	5776	66102		

*Significant at 0.05; df – 533; critical r = 0.138.

Discussion of the findings

Hypothesis one investigated the relationship between teachers' competence and integration of ICT in Basic Education; finding showed that there is a positive relationship between teachers' competence and integration of ICT in basic education. This means the more competent teachers are in the use of information communication technology tools, the more the possibility of their integration into the teaching/learning process. Invariably, teachers' competence is required if ICT integration into basic education would be achieved in Ogoja Education Zone. However, a lack of competence in the use of ICT tools on the part of the teachers would mean a low level of integration of these tools into the teaching/learning process. This finding corresponds with the result of a study by Emmanuel and Adelabu (2015), who observed, after examining the influence of teacher competence and availability of e-learning resources in secondary schools in Oyo Northern Senatorial District, that teachers had low-level competence in utilization of ICT and this impacted negatively on their teaching ability.

When teachers are competent in utilizing ICT media to deliver instructions to students, their utilization will be well integrated into the Universal Basic Education system, thereby enhancing pupils' academic performance and leading to the attainment of UBE goals. The finding that a positive relationship exists between teachers' competence and integration of ICT in basic education also agrees with the result of a study by Bingcag (2015) that there is a positive correlation between ICT competence and utilization of ICT in teaching and learning situations. The finding is also supported by an earlier study by Pelgrum and Law (2003), who observed that initially computers were used to teach computer programming but due to the development of the microprocessor, ICT utilization has become more

pervasive in society orchestrating the need for computing skills and competence in everyday life, including teaching.

Hypothesis two investigated the level of availability of hardware and integration of ICT in basic education. Findings revealed that there is a significant relationship between the level of availability of facilities and the integration of ICT in basic education. When ICT hardware devices such as computer CPUs, monitors, projectors, laptops, uninterrupted power supply (UPS), and cables among others are available for teaching and learning, there will be a progressive integration of ICT in basic education. But if these devices are unavailable, integration of ICT into the basic education programme will not be achieved. The finding agrees with that of Ajayi and Ekundayo (2009), who after carrying out a descriptive survey on the integration of ICT in Nigerian secondary schools observed that ICT facilities were lacking in schools, making it difficult to adopt and integrate ICT into the teaching and learning process.

Similarly, an earlier study by Tella (2011) in some South-west Nigerian colleges revealed that low level of usage of ICT in schools was attributed to non-availability of some ICT gadgets and equipment. Even if teachers are competent in utilizing ICT facilities to teach pupils, if the hardware are not in place, integrating ICT into basic education by instructing students via ICT gadget will be unattainable.

Hypothesis two examined the relationship between the availability of ICT facilities and the integration of ICT in basic education. Findings revealed that there is a positive relationship between the availability of infrastructure and facilities and the integration of ICT in basic education. This means that whenever resources or facilities are available for teaching, there is a corresponding integration of ICT in teaching in basic education. The finding also agrees with that of a study by Bhebbe and Maphosa (2020) that some schools are far from enhancing teaching and learning by integrating ICTs due to a lack of infrastructural facilities for effective teaching and learning. The result of a study by Ajayi and Ekundayo (2009) also suggests that the availability of infrastructural facilities relates to the effective integration of ICT into the school curriculum. The study revealed that because ICT facilities were lacking in schools, integration of ICT in teaching and learning in schools was hampered and limited. Other researchers with similar result are Jimoh et al. (2017) who found out that ICT facilities are not available in secondary schools, thereby making the teaching and learning of ICT/Computer studies/education subject difficult.

Conclusion

The findings of the study indicated positive relationship between teachers' competence, availability of infrastructure, and the integration of ICTs into basic education. This shows that competence on the part of teachers, as well as availability of ICT infrastructure would make it easy for ICTs use in the teaching/learning process. However, the absence of teacher competence and unavailability of ICT infrastructure make it difficult for ICT use in the teaching/learning process in the study area.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Teachers should be adequately trained through seminars, workshops, and ICT retraining programmes on how to handle and communicate instruction with ICT devices. This will give them the required competence so that ICT can be effectively integrated into basic education. A great number of serving teachers tend not to be equipped with basic computer operational skills. Therefore, for effective integration of ICT resources into the school curriculum, groundwork needs be done for their retraining with education curriculum relevant for the contemporary knowledge age.
2. Curriculum should be designed to reflect and integrate the use of ICT devices in schools to meet up with the demand in the digital age.
3. ICT facilities and infrastructure should be provided in schools to enhance and facilitate teaching and learning in line with the new knowledge paradigm for best global practices and competitiveness.
4. Infrastructural facilities such as buildings and, sources of electricity (solar & generators) should be provided in schools so that ICT devices can be stored safely and used efficiently.

References

- Ajayi, I. A. & Ekundayo, H. T. (2009). The application of information and communication technology in Nigerian secondary schools. *International NGO Journal*, 4(5), 281-286.
- Amuchie, A. A. (2015). Availability and Utilization of ICT Resources in Teaching and Learning in Secondary Schools in Ardo-Kola and Jalingo, Taraba State. *Journal of Poverty, Investment and Development*, 8, 94-101.
- Aribisola, J. O. (2006). Role of Information and Communication Technology in globalization. In Agagu, A. A (Ed.), *Information and Communication Technology and Computer Application*. Abuja: Pan of Press, 68-76.

- Badau, K. M., & Sakiyo, J. (2013). Assessment of ICT Teachers' Competence to Implement the New ICT Curriculum in Northeastern Nigeria. *Journal of Education and Practice*, 4(27), 10-20.
- Bamidele, S. O (2006). *Development of ICT and Internet System: Information and Telecommunication System*. Ado-Ekiti: General United.
- Bhebhe, S. & Maphosa, C. (2016). Examining Teachers' Computer Literacy and Utilization of ICTs in Teaching and Learning at Primary School Level. *Journal of Communication*, 7(2), 231-240.
<https://doi.org/10.1080/0976691X.2016.11884902>
- Bingcag, J. (2015). ICT competency and technology utilization of Philippine science high school teachers. A Paper presented at the 9th International Technology, Education, and Development Conference from 2 - 4 March, 2015 in Madrid, Spain. Pg: 7050-7060. Retrieved from <https://library.iated.org/view/BINGCANG2015ICT>
- Emmanuel, A. & Adelabu, A. O. (2015). An Investigation into teacher's competence on information communication and technologies (ICT) and availability of e-learning resources in the teaching of Mathematics in secondary schools. A Paper presented on 27th June 2015 at the World Conference on Educational Media and Technology, held at Montreal, Canada. Retrieved from <https://www.researchgate.net/publication/280132871>
- Enyi, E., B. I. & Tah, M. M. (2012). Availability and utilization of ICT tools for effective instructional delivery in tertiary institutions in Cross River State, Nigeria. *Global Advanced Research Journal of Educational Research and Review*, 1(8), 190-195. Retrieved from <http://garj.org/garjerr/index.htm>
- Ertmer, P. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration. *Educational Technology Research and Development*, 53(4), 25-39.
- Ezeuwa, L. (2014). Availability and utilization of ICT facilities as panacea for effective management of education in Ebonyi state public secondary schools. *Knowledge Review*, 31(2), 1-7.
- Gillespie, H. (2006). *Unlocking Learning and Reading with ICT: Identifying and Overcoming Barriers*. London: David Fulton.
- Hew, K. F. & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technological Research Development*, 55, 223-252.
- Iding, M., Crosby, M, & Speitel, T. (2002). Teachers and technology: Beliefs and practices. *International Journal of Instructional Media*, 29, 153-170.

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- Ijeoma, A. A., Joseph, E. O., & Franca, A. (2010). ICT Competence among Academic staff in Universities in Cross Rivers State, Nigeria. *Computer and Information Science*, 3(4), 109-115.
- Jimoh, A. T. (2007). Students' Attitude towards ICT in Nigeria Tertiary Institutions. *Education Focus*, 1(1), 73-79.
- Jimoh, A. A., Osunkunle, A. A., & Mushbahu, B. A. (2017). Assessment of ICT Infrastructure for Computer Education in Secondary Schools: Katagum. Education Zone, Bauchi State, Nigeria. *International Journal of Innovative Research in Technology, Basic & Applied Sciences*, 4(1), 45-50.
- Kabakci, I. (2009). A Proposal of Framework for Professional Development of Turkish Teachers with respect to Information and Communication Technologies. *Turkish Online Journal of Distance Education*, 10(3), 204-205.
- Koçak-Usluel, Y., Mumcu-Kuşkaya, F. & Demiraslan, Y. (2007). Information and communication technologies in the learning-teaching process: teachers' views on the integration process and obstacles. *Hacettepe University Faculty of Education Journal*, 32, 164-178.
- Krumsvik, R. (2008). Situated Learning and Teachers' Digital Competence. *Education and Information Technologies*, 13, 279-280.
- Lakkala, M., Ilomäki, L., & Kantosalo, A. (2011). Which areas of digital competences are important for a teacher? Retrieved on 17 December 2023 from <https://www.researchgate.net/publication/266852341>
- National Population Commission (2015). Population Census. Available at <http://www.nationalpopulation.gov.ng>
- Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: Results from a worldwide educational assessment. *Computer Education*, 37, 163-178.
- Pelgrum, W. J. & Law, N. (2003). *ICT in Education around the World: Trends, Problems and Prospects*. UNESCO-International Institute for Educational Planning.
- Peretomode, V. F. & Ikoya, P. O. (2010). Managing' Nigerian secondary schools reforms to enhance equity and globalization. *Educational Research and Reviews*, 5(6), 298.
- Quek, C. L., Wong, A. F. L. & Divaharan, S. (2007). Secondary school students' perceptions of teacher–student interaction and students' attitudes towards project work. *Learning Environ Res.*, 10, 177–187. <https://doi.org/10.1007/s10984-007-9030-3>
- Sabaliauskas, T., Bukantaite, D. & Pukelis, K. (2006). Designing Teacher Information and Communication Technology Competencies areas. *Vocational Education: Research and Reality*, 12, 152-161.

- Samantha, J. H., Peressini, D., & Meymaris, K. (2004). Technology-sullortes mathematics activities situated within an effective learning environment theoretical framework. *Contemporary Issues in Technology and Teacher Education*, 3(4), 362-381.
- Sharma, R. (2003). Barriers in Using Technology for Education in Developing Countries. *Computers & Education*, 41(1), 49-63.
- Tella, A. (2011). Availability and Use of ICT in South-Western Nigeria Colleges of Education. *International Multidisciplinary Journal, Ethiopia*, 5(5), 315-331. <http://dx.doi.org/10.4314/afrrrev.v5i5.25>
- Volman, M., & van Eck, E. (2001). Gender Equity and Information Technology in Education: The Second Decade. *Review of Educational Research*, 71, 613-634.
- Wang, Q. & Woo, H. L. (2007). Systematic planning for ICT integration in topic learning. *Educational Technology & Society*, 10(1), 148-156.
- 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.
- Yusuf, M. O., & Balogun, M. R. (2011). Student-Teachers' Competence and Attitude towards Information and Communication Technology: A Case Study in a Nigerian University. *Contemporary Educational Technology*, 2, 18-36. <https://doi.org/10.30935/cedtech/6041>
- Zhao, Y. & Cziko, G. A. (2001). Teacher Adoption of Technology: A Perceptual- Control-theory Perspective. *Technology and Teacher Education*, 9(1), 5-7.