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UTILISATION OF INFORMATION COMMUNICATION TECHNOLOGY (ICTS) IN THE TEACHING AND LEARNING PROCESSES AT FEDERAL COLLEGE OF EDUCATION (TECHNICAL), BENIN CITY

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ABSTRACT

In today's global educational setting, improved strategies for imparting knowledge and skills to students are evolving with serious implications for teachers and students. Information and Communication Technology (ICT) is widely used in education for collection, management and analysis. Nigeria being a developing nation recognizes the relevance of ICTs in national development and particularly in education. Hence, the deployment of ICT in Nigerian education system has received considerable attention. Despite the perceived importance and benefits associated with the use of ICT in the teaching and learning processes, there are still doubts among scholars on the actual impacts of ICT in the teaching and learning processes. In Nigeria, even though ICT facilities have been deployed in many learning institutions; there is little or no impact studies conducted to determine ICTs effect on teaching and learning outcomes. Hence, this study evaluated the impact of ICT in the teaching and learning processes in Federal College of Education (Technical), Benin City. The research design was descriptive survey using the ex post facto method while the main instrument of data collection was a structured questionnaire for teachers and students in the selected institution. Analysis was done using mainly descriptive statistics and result shows non- availability of many ICT facilities and low integration of ICT facilities in the teaching and learning processes. It further identifies the challenges to ICT utilization to non-availability of ICT facilities. In view of the importance of ICT, the paper calls for policies to address challenges facing ICT utilization in the Nigerian educational system

Introduction

In today's global educational setting, improved strategies for imparting knowledge and skills to students of all ages and educational levels are evolving with serious and vital implications for both the teachers and the students. One of such effective methods of current discussion in the world is the use of Information Communication Technologies (ICTs). Schools have embraced a wide range of ICT tools to enhance communication, information management, and learning experiences. This includes innovative methods like interactive whiteboards, utilizing students' personal devices for learning, and implementing the "flipped classroom" model. Information and

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Communication Technology (ICT) is widely used in education for collection, management, and analysis. ICT use can influence teaching and learning styles by changing the emphasis from a teacher-centered to a learner-centered style and provides opportunities to improve information-reasoning skills, communication skills, higher thinking skills, creativity, and problem solving (Tang, 2021). Nigeria being a developing nation recognizes the relevance of ICTs in national development and particularly in education. Hence the deployment of ICT in Nigerian education system has received considerable attention. The formulation of the National Policy on Computer Education in 1988 contained information on the application of ICT at various levels of the country's educational system.

Previous studies (Christmann, 2003; Waxman, 2003) have indicated that ICT driven instructional materials have the potential for enhancing student learning. Learning can be reinforced with ICT of different variety because they stimulate, motivate as well as arrest learner's attention for a while during the instructional process. Although in the developed countries of the world, quite a large number of scholars (Christmann, 2003; Waxman, 2003; Suarezrodriguez, Almerich, Orellana & Diazgarcia, 2018 and Tang, 2021) have identified a positive influence of ICT in the teaching and learning processes. However, several other scholars (Blackmore et al., 2003; Leuven 2004; Aristovnik, 2012; Cox and Marshall, 2007; Shaikh, and Khoja, 2011) have found little or no effect of ICT in the entire teaching and learning processes. Thus, despite the perceived potential advantages of ICT use, findings from the impact evaluation studies of ICT on learning outcomes have not shown consistent results (Aristovnik, 2012; Shaikh, and Khoja, 2011). In Nigeria, even though ICT facilities have been deployed in many learning institutions; there is little or no impact studies conducted to determine ICTs effect on teaching and learning outcomes (Amusa, & Atinmo, 2016). Hence, this study will evaluate the impact of ICT in the teaching and learning processes in Federal College of Education (Technical), Benin City, with a view to filling identified the above research gap.

The Purpose of the Study

The purpose of this study is to evaluate the impact of ICT in the teaching and learning processes in Federal College of Education (Technical), Benin City. Specifically the study intends to:

1. Identify the available ICT facilities for teaching and learning processes at the Federal College of Education (Technical), Benin City
2. Determine the present status of ICT integration in teaching and learning, curriculum development
3. Identify the benefits associated with ICT integration in the teaching and learning, curriculum development and students' assessment at the Federal College of Education (Technical), Benin City.

4 Identify the challenges to ICT integration in the teaching and learning processes at the Federal College of Education (Technical), Benin City.

Research Questions

Based on the foregoing, the following research questions are raised:

1 What are the available ICT facilities for teaching and learning processes at the Federal College of Education (Technical), Benin City?
2 What is the present status of ICT facilities integration into teaching and learning, curriculum development?
3 What are the benefits associated with ICT usage in teaching and learning, curriculum development and students' assessment at the Federal College of Education (Technical), Benin City?
4 What are the challenges to ICT integration in the teaching and learning, curriculum development and students' assessment at the Federal College of Education (Technical), Benin City?

Significance of the Study

Impact evaluation is now high on the development agenda. In the evaluation of the impact of ICT integration in the teaching and learning processes, the result will help to learn from the previous experiences in order to help the education sector improve the integration of ICTs in education. The impact evaluation findings will also help to uphold accountability which is important for various stakeholders who promote ICTs integration in the teaching and learning processes. This paper will therefore be of immense benefits to the Ministry of Education, the National Commission for College of Education (NCCE) and the country at large. It will enable them to know the effectiveness or otherwise of ICT as instructional technology in the teaching and learning processes. The result of this study will be of benefit to the schools, as they will be informed about the impact of ICT on both teachers and students in our schools and colleges. This study will also create awareness in the teachers and students as to the impact of ICT in teaching and learning process particularly. Beyond this and most critically, the impacts of ICT on learning outcomes have not shown consistent results globally and in Nigerian very little impact studies have been conducted to determine ICTs effect on teaching and learning outcomes. Hence, this study which will evaluates the impact of ICT in the teaching and learning processes in Federal College of Education (Technical), Benin City, will contribute to the literature on impact of ICT in the teaching and learning processes in Nigeria.

Theoretical framework

The main framework used in the paper is the ICT Impact Assessment Model. This model is conceived as a conceptual framework for researchers on impact assessment and is made up of the themes generated from (Adedokun-Shittu, 2012)'s study and named ICT Impact Assessment Model. The themes are: positive effects, challenges, incentives

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and integration as illustrated in the Figure 1 below. This model is represented in a cyclic form because the assessment process can start from any stage and the assessment could be done individually or holistically. This makes it useful for both formative and summative assessment of ICT integration in teaching and learning.

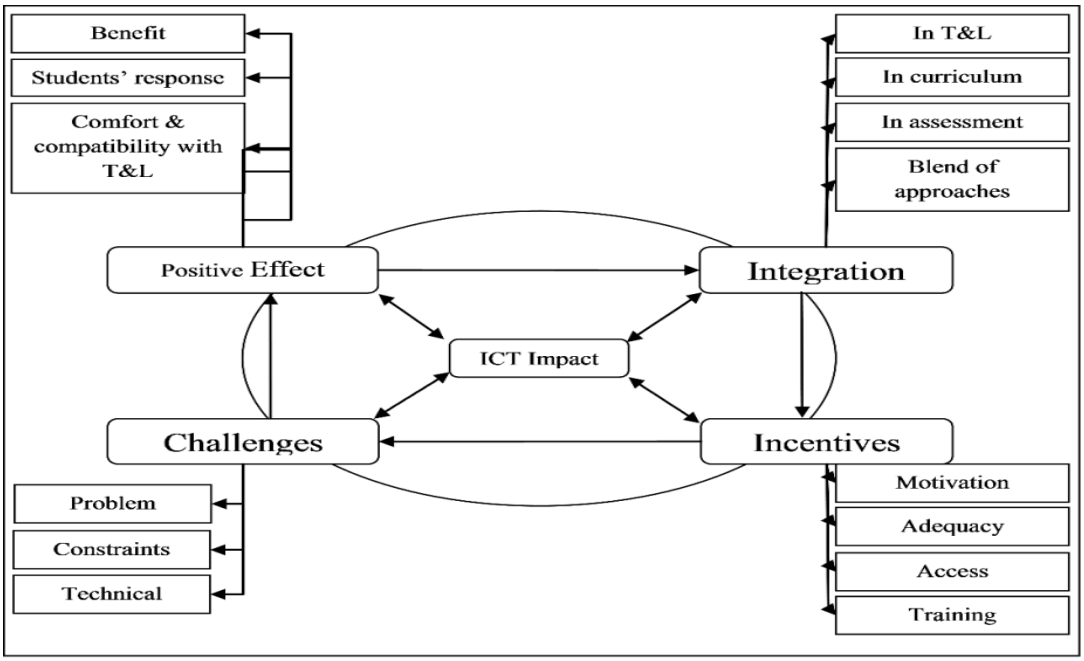


Figure 1: Adedokun-Shittu ICT Impact Assessment Model Layout (2012)

Positive effects comprise benefits, students' response and ICT compatibility/comfort in teaching and learning. The benefits include; ease in teaching and learning, access to information and up to date resources, online interaction between staff and students, establishing contact with the outside world through exchange of academic work and achieving more in less time are some of the contributions of ICT to teaching and learning. Among the students' response to the use of ICT identified by both students and lecturers are; students' punctuality and regularity in class, attentiveness, high level of ICT appreciation. The class is interactive and students enjoy it and prefer online assignment to offline. They use internet to search for resources and are often times ahead of the lecturer, teach lecturer use of some softwares and they contribute greatly in class. Students are pleased with the product of their learning with ICT and lecturers' proficiency in ICT skills has aided their comfort level and their ability to adapt

it to their teaching needs. Authors like Rajasingham (2007); Wright, Stanford & Beedle (2007) also found similar outcomes as positive effects of ICT in teaching and learning.

Challenges in this model include; problems, constraints and technical issues. Among the problems are; plagiarism, absenteeism and over reliance on ICT. Constrains identified especially in the Nigerian context are; large students' population, inadequate facilities and limited access in terms of working hours, insufficient buildings for the conduct of computer based exam, insufficient technical staff, no viable policy on ICT in place and epileptic power supply. The technical issues revolve around hardware, software and internet services. Many authors such as Ajayi (2002); Abolade and Yusuf (2005); Adedokun-Shittu, Shittu, Sheikh and Othman (2012) have discussed some of these issues as challenges of ICT in education settings.

The third component of this model is incentives and compose of four issues that include; accessibility, adequacy, training and motivation. King, et.al (2007) in a related study also derived incentives as part of the four themes found in their study. Other researchers that have suggested these incentives as part of ICT integration and evaluation issues are; King, et.al (2007); Madden et.al (2007); Yusuf (2005). These incentives need to generate some impact to be felt in the area of integration into teaching and learning before the deployment of ICT facilities in Higher Education Institutes could be deemed productive. Hence, the fourth part of this model is integration. Some of the areas where integration is required are; ICT integration in teaching and learning, ICT integration in curriculum, ICT-based assessment, and a blend of ICT-based teaching and learning methods with the traditional method. The ICT impact assessment model as discussed extends the CIPP and Kirkpatrick models of evaluation by adding an important element "challenges". The evolving nature of ICTs in education necessitates addressing the challenges related to teacher preparation, curriculum, pedagogy, assessment, technical issues, updating and maintaining ICT facilities and return on investment. This is why the extension element "challenges" is crucial for impact assessments and it gives the model an edge over existing models that are devoid of this element. The ICT impact assessment model will therefore be adopted for this study and it will guide the development of the instruments (survey questionnaire, interview questions).

Materials and Methods

The descriptive survey using the ex post facto method was used to collect the data for this study. The ex post facto method examines possible cause and effect relationship and was adopted in this study to explore the impact of ICT integration in the teaching and learning processes at the Federal College of Education (Technical), Benin City, Edo state. The study was carried out at the Federal College of Education (Technical), Benin City, in Edo State. The

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population of the study consists of all lecturers and the two hundred level students at the Federal College of Education (Technical) Benin City. The study adopted a multi-stage sampling technique. First, the College was divided into five schools based on the existing schools at the College in selecting the five departments used for the study. The student respondents were selected using systematic random sampling technique. A total of 200 students were drawn from the five departments while 50 teachers were randomly selected from the five departments. The main instrument is a questionnaire called the Impact of ICT in the Teaching and Learning Processes Questionnaire (IITLPQ). The questionnaire is divided into five sections as identified in the ICT Impact evaluation model. Section A is made up of demographic characteristics of the Respondents. Section B examines present status of ICT integration in teaching and learning. Section C focused on benefits associated with ICT integration in teaching and learning. Section D focuses on challenges to ICT integration in the teaching and learning processes. The questionnaire comprised of 50 items and each item was structured on a five point Likert scale ranging from a score of 1 to 4, with 1 = strongly disagree and 4= strongly agree. The validity of the instrument was done with the assistance of the researcher's supervisor and other experts in the Department in the Faculty of Education, University of Ibadan. Their comments, corrections and observations made on the test items were effected before the instrument was certified to be adequate for the study, thereby ensuring the face and content validity. The test re-test method was used to check the reliability of the instrument. The data were collated and analyzed using frequency counts and mean ($\overline{X}$?). The point of decision was fixed at 2.0 since the questionnaire is a four point scale. Any item that attracted a mean of 2.0 and above was regarded as agreed while any item that attracted a mean of less than 2.0 was regarded as disagree.

Analysis of Research Questions

Research Question One: What are the available information Communication Technology at the Federal College of Education (Technical), Benin City

The first research question of the paper attempts to determine the level of availability of ICT resources at the Federal College of Education (Technical), Benin City. Table 1 shows the available information Communication Technology at the Federal College of Education (Technical), Benin City. There are a total of 13 different ICT resources assessed at the college (Table 1).

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Table 1: Available Information Resources in the Federal College of Education (Technical) Central Library

S/N	What are the available information Communication Technology at the College of Education Benin City?	Available (A)	Not Available (NA)
1	Radio	A	-
2	Satellite	-	NA
3	Interactive CD	-	NA
4	Mobile/Internet Smart Phones	A	-
5	Multimedia Projector	A	-
6	Video Player	-	NA
7	Screen	-	NA
8	Laptops/Tablets/Ipads	-	NA
9	Internet connected computers and Laptops	-	NA
10	Standby generators	A	-
11	Digital camera	-	NA
12	Interactive white board	A	-
13	College Website	A	-
	Availability in Percentage (%)	**46.2**	**53.8**

The table indicates that out of the 13 stated ICT resources that are expected to be provided for the teaching and learning processes, only 46.2% were provided. The majority (54.8%) of the ICT are not available at the college. Information communication technology resources lacking in the college include satellites, interactive CD, video player, internet connected computers and laptops among others. Colleges and the schools systems are supposed to equipped with these facilities. The absence of these facilities only implies that they will not be available to the teachers and students in the teaching and learning processes of the college.

Research Question Two: What is the present status of ICT facilities integration into teaching and learning, curriculum development?

The second research question of the study examines the status of ICT facilities integration in the teaching and learning processes at the Federal college of Education (Technical), Benin City.

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Table 2: Status of ICT Facilities Integration into Teaching and Learning processes

S/N	Items	Cumulative	$\bar{X}$	Decision
1	I Use the internet to find teaching material.	80	1.60	Agreed
2	I employed ICT facilities for subscription for on-line exam	75	1.50	Agreed
3	I utilize ICT facilities for online registration and follow of students learning activities	55	1.10	Disagreed
4	I employed instructional packages in digital audios and CD-ROMS for instruction	90	1.80	Disagreed
5	My students are giving assignment to download internet materials	120	2.40	Agreed
6	I use e-mail to send information to students on assignment	75	1.50	Disagreed
7	I utilize ICT facilities in the distribution of learning materials tasks for students	95	1.90	Disagreed
8	I use computer to prepare teaching material.	100	2.0	Agreed
9	Use computer to keep confidential information	115	2.30	Agreed
10	I use computer to solve teacher's duty	120	2.40	Agreed
11	I use Power Point slide in teaching activity.	88	1.76	Disagreed
12	I deploy computer as a teaching aid tool during teaching	85	1.75	Disagreed
13	Encourage students to use computer in learning process	95	1.90	Agreed
14	Use computer to present teaching material	85	1.75	Disagreed
15	I utilize internet materials for research and publications	195	3.90	Agreed
16	ICT is taught as a separate subject in my college	115	2.30	Agreed
17	ICT is integrated in my subject because I choose to do so	88	1.76	Disagreed
18	ICT is integrated in my subject because of curriculum requirements	100	2.0	Agreed
19	I use ICT to provide feedback and/or assess students' learning	80	1.60	Disagreed
20	Use applications to prepare presentations for lesson	90	1.80	Disagreed
	Average	**1946**	**1.96**	**Disagreed**

ICT facilities are usually important component of the school system. They are expected to be provided and at the same time integrated in the day to day running of the school system most especially in the teaching and learning processes. As shown in Table 1, most of the necessary ICT facilities needed for the purposes of teaching and learning are not available at the college. Similarly, Table 2 shows low level of ICT integration by the teachers in the teaching and learning processes at the college. An overall mean of 1.96 clearly indicates the low integration of ICT facilities by the teachers at the college. Out of the 20 different strategies of ICT integration in the teaching and learning processes examined, only 7 of the items were agreed to by the teachers as being used in the teaching and learning processes with mean ranging from 2.0 to 3.90. Other vital strategies scored mean of less than 2.0 meaning that the teachers do to agree to their utilization in the teaching and learning processes.

Research Question Three: What are the benefits associated with ICT usage in teaching and learning at the Federal College of Education (Technical), Benin City?

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Table 3 A: Benefits Associated with ICT Usage in Teaching and Learning at the Federal College of Education (Technical), Benin City

S/N	Items	Cumulative	$\bar{X}$	Decision
1	I maintain my focus on teaching by using ICT facilities in teaching activity.	180	3.60	Agreed
2	ICT helps me to build students interests in my teaching activity	124	2.48	Agreed
3	ICT help me to diversify my teaching methods	100	2.0	Agreed
4	ICT facilities integration in my teaching process causes my teaching to be more effective.	100	2.0	Agreed
5	ICT facilities integration in my teaching process helps me to teach systematically	95	1.90	Disagreed
6	ICT facilities integration in my teaching process helps to build my confident in my teaching process.	124	2.48	Agreed
7	ICT integration in my teaching process makes me more energetic in teaching.	75	1.50	Disagreed
8	ICT facilities integration creates a conducive classroom environment for learning	75	1.50	Disagreed
9	Students concentrate and understands faster when I ICT facilities are integrated into my teaching	175	3.50	Agreed
	Average	116.4	2.33	Agreed

Table 3a indicates that the teachers generally agreed that ICT integration in the teaching and learning processes accrues several benefits to them in the teaching and processes even though many of them do not integrate it in their teaching and learning process. An overall mean of 2.33 clearly shows that the teachers agree to the benefits of ICT integration. Of the total 9 benefits of ICT integration in the teaching and learning processes, the teachers agrees to 6 of the benefits. The implication of this is that when ICT facilities are made available to the teachers, the teachers will generally integrate them into the teaching and learning processes. On the part of the students, the paper attempts to understand the benefits of ICT integration and Table 3b shows students perception on the benefits on ICT integration.

Research Question Three: What are the benefits associated with ICT usage in teaching and learning at the Federal College of Education (Technical), Benin City?

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Table 3 B: Benefits Associated with ICT Usage in Teaching and Learning at the Federal College of Education (Technical), Benin City

S/N	Items	Cumulative	$\bar{X}$	Decision
1	I concentrate more on what am learning when ICT are integrated into teaching process	500	2.50	Agreed
2	I feel more independent in my learning when ICT are integrated into the teaching and learning processes	520	2.60	Agreed
3	I understand more easily when am learning with ICT	400	2.0	Agreed
5	ICT enables me to work better with other students on tasks	600	3.0	Agreed
6	ICT improves the atmosphere in class (e.g. students are more engaged, there is less disruption)	430	2.20	Agreed
	Average	**490**	**2.46**	**Agreed**

Table 3b shows that the students agreed to all the 6 identified benefits of ICT integration. An overall mean of 2.46 indicates that the students agreed to the benefits of ICT integration. This means that if the right ICT facilities are provided and teachers integrate them into their teaching and learning processes, it will improves teaching outcomes and students achievements. In this light, the paper further attempts to identify the barriers to ICT integration in the process of teaching and learning at the Federal college of Education (Technical), Benin City.

Research Question Four: What are the challenges to ICT integration in the teaching and learning, curriculum development and students' assessment at the Federal College of Education (Technical), Benin City?

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Table 4: Challenges to ICT integration in the teaching and learning at the Federal College of Education (Technical), Benin City?

S/N	Items	Cumulative	$\bar{X}$	Decision
1	Insufficient number of computers	120	2.40	Agreed
2	Insufficient number of internet-connected computers	155	3.10	Agreed
3	Insufficient Internet bandwidth or speed	180	3.60	Agreed
4	Insufficient number of interactive whiteboards	180	3.60	Agreed
5	Insufficient number of laptops/notebooks	160	3.20	Agreed
6	School computers out of date and/or needing repair	50	1.0	Disagreed
7	Lack of adequate skills of teachers	80	1.60	Disagreed
8	Insufficient technical support for teachers	90	1.80	Disagreed
9	Lack of adequate content/material for teaching	95	1.90	Disagreed
10	Lack of content in national language	90	1.80	Disagreed
11	Too difficult to integrate ICT use into the curriculum	95	1.95	Disagreed
12	Lack of pedagogical models on how to use ICT for learning	85	1.70	Disagreed
13	Lack of relevant softwares	145	2.90	Agreed
14	School space organization (classroom size and furniture, etc)	80	1.60	Disagreed
15	Pressure to prepare students for exams and tests	95	1.95	Disagreed
16	Most parents not in favour of the use of ICT at school	80	1.60	Disagreed
17	Most teachers not in favour of the use of ICT at school	75	1.50	Disagreed
18	Lack of interest of teachers	75	1.50	Disagreed
19	High cost of ICT facilities	132	2.64	Agreed
20	Limited access to internet facilities	145	2.90	Agreed
	Average	**110.35**	**2.20**	Agreed

Table 4 attempts to answer research question 4. It identifies the challenges to ICT integration in the teaching and learning processes. The table identifies insufficient number of computers, insufficient number of internet-connected computers, insufficient Internet bandwidth or speed, insufficient number of interactive whiteboards, insufficient number of laptops/notebooks, lack of relevant softwares, high cost of ICT facilities and limited access to internet facilities. All these have means of above 2.0 meaning that the teachers agreed these challenges hinders the integration of ICT facilities in the teaching and learning processes at the Federal College of education (Technical), Benin City. One obvious observation from the challenges is the fact that they are all school related facilities. The implication of this is that effort to promote integration of ICT facilities must focused on school based facilities in the school.

Discussion of Results

Bringing ICT into practice has a major impact to facilitate and improve learning. In the study, it was discovered that the majority of ICT facilities that promotes teaching and learning processes are not available at the school. This finding is supported by several scholars who identified lack of ICT

resources as a major factor limiting the integration of ICT facilities in schools. For instance, Sicilia (2015) found that teachers complained about lack of access to computers while Becta (2014) also identified inaccessibility of ICT resources as a major barrier to ICT integration in the teaching and learning processes.

The study further shows that there is poor integration of ICT facilities into the process of teaching and learning. This finding is expected as most of the necessary facilities required for teaching are not available in the school. This finding is supported by Muriithi (2005); (Maduekwe, 2006) and (Kwache, 2007) who separately found that there is low integration of ICT facilities in the teaching and learning processes in many developing countries.

The paper further shows that ICT of importance benefits to teachers and students in the teaching learning processes. However, this finding is of crucial importance because even though the paper shows that there is low integration of ICT facilities, both the teachers and students alluded to the fact that ICT integration benefits both the teachers and the students respectively. This finding is supported by Davis and Tearle, (1999) and Harris (2002) findings which collaborated the fact that ICT benefits both teachers and students when integrated into the teaching and learning.

Finally, the paper identified the challenges militating against the integration of ICT facilities in the teaching and learning process. The challenges are mainly institutionally based implying that when the facilities are provided by the college, these challenges will be eradicated from the school.

Conclusion

ICT integration is valuable for a meaningful teaching and learning process. However, the absence of these basic ICT facilities at the Federal College of Education (Technical), Benin City means that the teachers cannot effectively integrate them into their teaching and learning process. The situation is more critical because most of the challenges identified are institutional based. This places the onus of ICT integration into the teaching and learning processes on the hands of government and the institution. To promote ICT integration at the Federal College of Education (Technical), Benin City, it is important for government and the institution to provide the necessary ICT facilities at the college. This will facilitate the adoption and integration of the facilities by the teachers into their teaching and learning processes.

REFERENCES

Abolade, A.O., & Yusuf, M.O. (2005). Information and communication technology and Nigerian Teacher Education. *African Journal of Educational Studies*, 3(10), 19-23.

Adedokun-Shittu N.A., & Shittu A.J.K. (2011). Critical Issues in Evaluating Education TECHNOLOGY. In Al-Mutairi, M. S. & Mohammad, L. A, (eds.) (2011). *Cases on ICT utilization, practice and solutions: Tools for*

managing day- today issues. Chapter (4), 47–58. IGI global.

Adedokun-Shittu, N., Shittu, A., Sheikh, I., & Othman, J. (2012). The deployment of ICT facilities in teaching and learning in Higher Education: a mixed method study of its impact on lecturers and students. JOURNAL OF APPLIED COMPUTING. 8. 5-11. www.researchgate.net/publication/262011550_The_deployment_of_ICT_facilities_in_teaching_and_learning_in_Higher_Education_a_mixed_method_study_of_its_impact_on_lecturers_and_students/citation/download Retrieved on 23/10/2024.

Ajayi, G.O. (2002). African response to the information communication technology revolution. *ATPS Special Paper No. 8*. Retrieved December 23, 2014 from http://www.atpsnet.org/docs/Ajayi.pdf.

Amusa, O. I., & Atinmo, M. (2016). Availability, Level of use and Constraints to use of ElectronicResources by Law Lecturers in Public Universities in Nigeria. Italian Journal of Library and Information Science. 7(3), 139-172.

Aristovnik, A. (2012). The Impact of ICT on Educational Performance and its Efficiency in Selected EU and OECD Countries: A Non-parametric Analysis, *The Turkish Online Journal of Educational Technology*, *11(3)*.144-152.

Becta.(2014). A Review of the Research Literature on Barriers to the Uptake of ICT by Teachers. Retrieved from: http://partners.becta.org.uk/page_documents/research/barriers.pdf.

Blackmore, J., Hardcastle, L., Bamblett, E. and Owens, J. (2003). *Effective use of Information and Communication Technology (ICT) to Enhance Learning for Disadvantaged School Students*: Deakin Centre for Education and Change; Institute of Disability Studies, Deakin University and Institute of Koorie Education, Deakin University.

Christmann, E. P. (2003). A Meta-analytic Comparison of the Effects of Computer-assisted Instruction on Elementary Students' Achievement. *Information Technology in Childhood Education Annual, Annual 2003* (14), 91.

Cox. M., & Marshall, G. (2007). Effects of ICT: Do We Know What We Should Know?, *Educational and Information Technology Journal*, *12*, 59-70.

Davis, N.E., & Tearle, P. (Eds.). (1999). A Core Curriculum for Telematics in Teacher Training. Available: www.ex.ac.uk/telematics.T3/corecurr/tteach98.htm

Harris, S. (2002). Innovative Pedagogical Practices using ICT in Schools in England. *Journal of Computer Assisted Learning* , No. 18, Pp;449-458

King, K. P., Melia, F., & Dunham, M. (2007). Guiding our way: Teachers as Learners in online Learning, Modeling Responsive Course Design Based on Needs and Motivation. In L. Tomei (ed.). Integrating Information & Communications Technologies into the

Classroom (vol.1) Advanced Directions in Instructional Technology Series (pp. 307-326). Pittsburgh: Idea Group

Kwache, P. Z. (2007) The Imperatives of Information and Communication Technology for Teachers in Nigeria Higher education. *MERLOT Journal of Online Learning and Testing (JOLT).* Available from http://jolt.merlot.org/vol.3no4kwache.htm. Retrieved 20th March, 2015.

Leuven, E. (2004). The Effects of Extra Funding for Disadvantaged Pupils on Achievement, IZA Discussion paper. NO. 1122. Boon: Institute for the Study of Labor.

Madden, A. D., Nunes, J. M., McPherson, M. A., Ford, N., Miller, D., (2007). Mind the Gap!: New 'Literacy 'create new Divides. In L. Tomei, *Integrating Information and Communications Technologies into the classroom*. USA: Idea Group. Information Science Publishing.

Maduekwe, A. N. (2006) Perspectives on Teacher Education and ICTs in Language Classroom. In V. B. Owhotu (ed.) *An Introduction to Information Technologies in Education.* Lagos: Sibon Books Ltd.

Muriithi P. (2005). A Framework for Integrating ICT in the Teaching and Learning Process in Secondary Schools in Kenya. MSc. Thesis Submitted at the University of Nairobi, School of Computing and Informatics.

Rajasingham, L. (2007). Perspectives on 21st Century E-Learning in Higher Education. In L. Tomei, *Integrating Information and Communications Technologies into the classroom*. USA: Idea Group. Information Science Publishing

Shaikh, Z., A., & Khoja, S. A. (2011). Role of ICT in Shaping the Future of Pakistani Higher Education System. *The Turkish Online Journal of Educational Technology*, 10(1), 149-161.

Sicilia, C (2015). The Challenges and Benefits of Teachers Practices in Constructivists Learning Environment Supported by Technology. Unpublished MSc. Thesis, McGill University, Montreal.

Suarezrodriguez, J. M., Almerich, G., Orellana, N., & Diazgarcia, I. (2018). A basic model of integration of ICT by teachers: Competence and use. Educational Technology Research and Development, 66(5), 1165–1187.

Tang, Y. (2021)Does information and communication technology (ICT) empower teacher innovativeness: a multilevel, multisite analysis. Education Tech Research Dev 69, 3009–3028 (2021). https://doi.org/10.1007/s11423-021-10052-1. Retrieved on 23/10/2024.

Waxman, C.H. (2003). *A Meta-analysis of the Effectiveness of Teaching and Learning with Technology on Student Outcomes.* Naperville, Illinois: Learning Point Associates.

Wright, V. Stanford, R. and Beedle, J., (2007). Using a Blended Model to Improve Delivery of Teacher Education Curriculum in Global Settings. In L.

Tomei, *Integrating Information and Communications Technologies into the classroom*. USA: Idea Group. Information Science Publishing. Pg 51-61

Yusuf, M. O. (2005). Information and Communication Technology and Education. Analyzing the Nigerian National Policy for Information Technology. *International Education Journal*, *6* (3), 316 - 321 Retrieved 29th March, 2015 from http://iej.cjb.net