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Barriers to integration of information and communication technology on teaching and learning process in secondary schools in rivers state

Hillary Wordu, Chinesom Njoku
Faculty of Education, Rivers State University, Port Harcourt, Nigeria

Abstract
The study examines barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State. Two research questions were answered to guide the study. The study employs the descriptive research survey design. The population of the study was 6,893 teachers from 286 senior secondary schools in Rivers State. The sample for the study was 378 teachers which was selected using simple random sampling technique. The instrument for data collection was a self-structured questionnaire tagged "Barriers of Information and Communication Technology Integration in Teaching Learning Questionnaire (BICTITLQ)" which was designed after a 4-point rating scale of agreement. The instrument was validated and tested for reliability using test-retest method. A reliability coefficient of 0.83 was established through Pearson Product Moment Correlation (PPMC) coefficient. Data collected were analysed using mean with standard deviation to answer the research questions. The study found that school factors and teachers were barriers to the integration of information and communication technology in teaching and learning in senior secondary schools in Rivers State. Based on the findings of the study, it was recommended among others that teachers should be trained on the use of information and communication technology for instructional process. There should be adequate provision information and communication technology facilities to aid its integration in teaching and learning process.

Keywords: barriers to integration, information and communication technology, teaching and learning process

Introduction

Education is since regarded as a dependable tool which can be used to confront the challenges of our complex global society, therefore the quality and relevance of the kind of education provided to any people determines their preparedness to face the challenges of the 21st century. Throughout the world, the challenge for school system is that of providing an effective education for all children and young people which will prepare them for work and participation in all spheres of human society as well as for global competitiveness.

Today, education has moved from the era of verbal discussion in the classroom and seminars and demonstration between teachers and learners where a face-to-face contact was necessary for learning to take place. This is because the world today is fast moving towards digitalization which have affected every aspect of the society such as religion, financial institutions, political institutions, and educational institutions. The use of modern practice has gain momentum over the use with the use of machines and tools for easy communication, therefore, teaching and learning cannot be left in the dark. This calls for the use of Information and Communication Technology (ICT) in teaching and learning process in the classroom to be paramount especially at the secondary school levels where there are teeming youths that are conversant with digital technological devices.

InfInformation and Communication Technology is a process of creating, processing, storing, retrieval and dissemination of information and data using computers and telecommunications devices (Wordu, Ugbari & Duba, 2022.) [24]. Information and Communication Technology (ICT) has become one of the basic building blocks of the modern society. The radical technological transformation in both developed and developing countries has made pervasive impacts on various segments. Therefore, it is not surprising to find an exponential growth in the use of ICT in education all over the world. Some impressive evidence on the effectiveness of ICT in education reveals that it has greater impact than any other innovation (Fluck, 2013) [9]. The emergence of the knowledge economy has also brought much greater emphasis on education. Almost all countries now regard ICT competency as a part of the core of education that facilitates to develop students' capacities for self-learning, problem solving, critical thinking and collaboration among (Yuen, Law & Wong, 2013) [25].

Kozma and Anderson (2012) [15] claim that ICTs are transforming schools and classrooms by bringing in new curricula based on real world problems, proving scaffolds and reflection, and building local and global communities that include students, teachers, parents, practicing scientists and other interested parties. Similarly, Hepp (2014) [14] state that the roles ICTs play in the educational system can be pedagogical, cultural, social, professional, and administrative. Information and Communication Technology (ICT) is defined as a diverse set of technological tools and resources used to communicate and to create, store, disseminate and manage information (Fluck, 2013) [9]. These technologies include broadcasting technologies (radio and television) as well as newer digital technologies such as computers and the internet, which enable set of powerful tools for educational change and reform. Information and communication technology is a shorthand for the computers, software, networks, satellite links and related systems that allow people to access, analyze, create exchange, and use data, information and knowledge in ways that were almost imaginable (Grimus, 2010) [12].

The way ICT is used makes it mean different things to different people because of its multipurpose and hence there are various views and definitions of ICT. ICT is the collection of information handling tools that are used to produce, store, process, distribute and exchange information. Similarly, Yusuf (2005) [26] described ICT as an electronic technology used for accessing, processing, gathering, manipulating, presenting, and communicating information.

Information and Communication Technologies (ICTs) is a term which is currently used to denote a wide range of services, applications, and technologies, using various type of equipment and software, often running over telecom networks (Heathcote, 2020 [13]; Dania & Enakrire, 2012) [7]. ICTs include well known telecom service such as telephone and fax. Telecom service used together with computer hardware and software form the basis of a range of other service, including email, the transfer of files from one computer to another and in particular the internet, which potentially allows all computers to be connected, thereby giving access to source of knowledge and information stored on computers worldwide (Galanouli & McNair,2021 [10]; McCormick and Scrimshaw, 2001 [17]; Mills & Tincher, 2018) [18]. Its application includes: video conferencing, tele-working, distance learning, management information system, stock taking and many more. These technologies can be said to include a broad array ranging from "old" technologies such as radio and TV to "new" ones such as cellular mobile.

Technologies like shared software, video conferencing, digital imaging and editing facilities, video walls for image projection and online-learning communities are used in schools that allow creating and disseminating knowledge more effectively. Further, chat and instant messaging, virtual art gallery and virtual museum are tremendous information sharing technologies used in school. Virtual learning systems are useful tools to store information digitally. Interactive whiteboards transform traditional black boards into an entirely different interactive teaching tool. Condie and Munro (2017) [6] describes mobiles technologies, learning platforms and virtual learning environments as information dissemination technologies, which are fast becoming central to whole range of tools that support school activities. E-portfolios are larger personal online space that allow users to store, organize and personalize information, collaborate, and receive feedback (Becta, 2015) [3].

The effective use of ICT in schools continues to rise steadily. ICT is now widely recognized as an essential tool for teaching and learning in the 21st century. It is noticeable that most teachers regard ICT positively and report increased uses of computers for planning, preparing presentations, worksheets and other learning materials, administration, assessment and tracking students' progress (Ofsted, 2014) [19]. The effective integration of ICT in education is a complex and multifaceted process. The appropriate use of ICT expands access to education, strengthens the relevance of education to highly digital work environments and raises educational quality (Tinio, 2013) [23]. It is further observed that ICT can impact positively on students' educational performance, motivation, attention, collaboration and communication and process skills (Balanskat, Blamire & Kfala, 2016) [2]. On the other hand, it shows considerable evidence regarding the impact of ICT on teachers' increased enthusiasm, efficiency, and collaboration.

The integration of ICT in the secondary education is a national policy across many countries. There is enough evidence to suggest that ICT has the potential to impact on every aspect of the school activities. Thus, schools cannot remain as mere venues in the fast-growing technological transformation. They must promote an effective use of ICT to promote new way of teaching and learning, information management, professional development, creatively and so on. Rosnaini and Mohd (2008) [21] define ICT integration as the process of determining where and how technology fits in the teaching and learning scenario.

Accordingly, Masoumi and Lindström (2012) [16], argued that effective usage of ICT resources is influenced by explicit institutional visions and goals (long-term aims that guide current practice) and a well-defined mission and strategy that describes technology's place in education. Elaborating further, Brzycki and Dudt (2015) [4], maintained that administrative support is a critical factor in successful integration of ICT in the teaching and learning process. Furthermore, Bosley and Moon (2019) [5], found that, support from management level for implementing new practices and addressing. financial implications, involvement of several members of staff, collaboration and mutual support and willingness to take risks are crucial factors for technology integration in schools. Moreover, Gilbert (2000) [11], found that, adequate time for users to learn and practice the new skills, administrative support, technical support and incentives can be predictors of effective technology use in teaching and learning. Spender (2015) [22] pointed out that, lecturers who use ICT resources face some challenges such as heavy teaching and learning loads, lack of easy access to necessary equipment, irreversible pedagogical consciousness raising and patience with new media, and lack of personal technical skills. It is imperative to examine barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State.

Statement of the Problem

It is important to note that, developing countries like Nigeria may be able to become competitive in the global economy only through the adoption of ICTs in the teaching and learning process. The use of ICT in teaching and learning in the classroom is a trending area in education. Early studies on technology and education sought to demonstrate the impact of technologies or ICT resources on student learning and were tied very specifically to the technologies used by the subjects of study (Honey, Culp and Carrigg, cited in Angers, 2014) [1]. The most published research articles describe methods of getting students or faculty more involved with a technology (e.g., the Internet, computer) or how to structure training and other conditions to get them more interested in using technology in general (Roblyer & Knezek, 2018) [20]. However, the extent to which ICT are integrated by teachers for teaching and learning is concern to educational stakeholders. Hence, this study seeks to examine barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State.

Purpose of the Study

The purpose of the study is to examine barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State. Objectively, the study seeks to;

1. Determine school factors as barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State.
2. Find how teacher factors as barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State.
3. Find out student factors as barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State.

Research Questions

The following questions were answered to guide the study.

1. What are the school factors that act as barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State?
2. What are the teacher factors that act as barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State?
3. What are the student factors that act as barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State?

Methodology

The study employed the descriptive research survey design. The study was carried out in senior secondary schools in Rivers State. The population of the study was all the secondary schools in Rivers State. As at the time of this study, Rivers State has 286 senior secondary schools with 6,893 teachers. The sample size for the study was 378 teachers obtained through Taro Yamen sample size determination method and selected through simple random sampling technique and used for the study. The instrument for data collection was a self-structured questionnaire tagged "Barriers of Information and Communication Technology Integration in Teaching Learning Questionnaire (BICTITLQ)" which was designed after a 4-point rating scale of agreement. The instrument was validated and tested for reliability using test-retest method. A reliability coefficient of 0.83 was established through Pearson Product Moment Correlation (PPMC) coefficient. Data collected were analysed using mean with standard deviation to answer the research questions. Item with mean value less than 2.50 was taken as "disagree" while item with mean value of 2.50 and above was taken as "agree".

Results

The result of the study was presented in Table 1 – 3 below.

Research Question 1

What are the school factors that act as barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State?

Table 1: Mean Responses School Factors on Integration of Barriers of ICT

S/N	Item Statement	X	SD	Decision
1	Lack of internet connectivity	3.41	0.86	Agree
2	Lack of teacher guides to support ICT integration	3.20	1.01	Agree
3	unreliable source of power supply	3.17	0.84	Agree
4	Poor maintenance culture	2.69	0.69	Agree
5	Inability to retain technology-savvy business studies teachers	2.94	1.01	Agree
6	Limited access to ICT equipment	3.16	0.74	Agree
7	Absence of ICT mainstreaming into schools' strategies	3.08	0.63	Agree
8	Inadequate power supply	3.07	0.84	Agree
9	Insufficient technical staff	3.20	0.70	Agree
10	Inadequate manpower/funds to train teachers on application of ICT in teaching and learning	2.97	1.02	Agree
11	Inadequate training and continuous professional development	3.05	0.69	Agree
12	Lack of support and motivation school management	3.07	1.11	Agree
13	Poor maintenance culture of available ICT resources	2.80	0.87	Agree
14	Absence of good ICT policy	3.03	0.68	Agree
	Average Mean/SD	3.06	0.84	Agree

Source: Researcher's Field Result; 2023

Result from Table 1 revealed the school factors that act as barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State. The result revealed that the respondents (teachers) agree on all the items as school factors that are barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State. This is shown in the response with mean value between 2.69 and 3.41 which are higher than the cut-off points of 2.50. An average mean of 3.04 and standard deviation of 0.84.

Research Question 2

What are the teacher factors that act as barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State?

Table 2: Mean Responses of Teacher Factors on Barriers of Integration of ICT

S/N	Item Statement	X	SD	Decision
15	Anxiety about advanced technologies	3.58	0.82	Agree
16	Lecturers' workload/insufficient time to apply ICT in teaching	3.14	0.63	Agree
17	Lack of self-motivation towards ICTs	2.96	1.01	Agree
18	Inappropriate teacher training on the effective integration of ICTs in teaching	3.05	0.70	Agree
19	Lack of ICT skills	3.11	0.80	Agree
20	Fear of losing professional autonomy during instruction	2.86	1.01	Agree
21	Resistance to innovative approach to	3.03	0.72	Agree
22	Inability to keep pace with resent developments in ICTs	3.27	0.84	Agree
23	Attitudes of lecturers towards integration of ICT in teaching and learning process	3.03	1.11	Agree
24	Use of browsing phones and I-pad by teachers	3.06	1.01	Agree
25	Inadequate knowledge in ICT application by some teachers	3.18	0.69	Agree
26	Poor maintenance culture of available ICT resources	3.61	0.72	Agree
	Average Mean/SD	3.16	0.83	Agree

Source: Researcher's Field Result; 2023

Result from Table 2 revealed the teacher factors that act as barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State. The result revealed that the respondents (teachers) agree on all the items as teacher factors that are barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State. This is shown in the response with mean value between 2.86 and 3.61 which are higher than the cut-off points of 2.50. An average mean of 3.16 and standard deviation of 0.83.

Discussion of Findings

Result from Table 1 revealed school factors that act as barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State. These factors include lack of internet connectivity, lack of teacher guides to support ICT integration, unreliable source of power supply, poor maintenance culture, inability to retain technology-savvy business studies teachers, inadequate training and continuous professional development and absence of ICT mainstreaming into schools' strategies among others. The finding of this study is in line with Balanskat, Blamire and Kefala. (2016) [2] view that school-level barrier to ICT integration include those factors related to the institutional context such as the absence and/or poor quality of ICT infrastructure, limited access to ICT equipment, school's limited project-related experience, lack of experience in project-based learning and absence of ICT mainstreaming into schools' strategies.

Result from Table 2 revealed teacher factors that act as barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State. These factors include lack of self-motivation towards ICTs, inappropriate teacher training on the effective integration of ICTs in teaching, anxiety about advanced technologies, use of browsing phones and I-pad by lecturers, fear of losing professional autonomy during instruction, attitudes of lecturers towards integration of ICT in teaching and learning process and inadequate knowledge in ICT application by some lecturers among others. The finding of this study is in line with Etokakpan, Piate and Effiong (2020) [8] who found that teacher factors that affects the integration and implementation of ICT in the classroom for teaching and learning include fear of losing professional autonomy during instruction, lack of ICT skills, anxiety about advanced technologies, resistance to innovative approach to and inability to keep pace with resent developments in

ICT Conclusion

The study conclude that there are factors that act as barriers to the integration of information and communication technology in teaching and learning process in secondary schools in Rivers State. Based on the findings of the study, it was found that some of these factors are teacher factors and school factors contribute as barriers to integration of information and communication technology in teaching and learning process in schools in secondary schools.

Recommendations

Based on the findings of the study, the following recommendations were made.

1. Teachers should be trained on the use of information and communication technology for instructional process.
2. There should be adequate provision information and communication technology facilities to aid its integration in teaching and learning process.

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