Effect of Integrating ICT in Social Studies Lesson Delivery on Students' Achievement and Retention at Alvan Ikoku Federal University of Education

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ABSTRACT

This study investigated the effects of integrating Information and Communication Technology (ICT) into Social Studies lesson delivery on students' achievement and retention in Alvan Ikoku Federal University of Education Owerri, Imo State. This research used a Quasi-experimental design. The study area was Alvan Ikoku Federal University of Education Owerri (AIFUE). The population of the study was 200 second-year students in Social Studies, Alvan Ikoku Federal University of Education Owerri, Imo State. The sample size was the entire population of 200 second-year students. Three (3) Objectives, three (3) Research questions, and three (3) Hypotheses guided the study. The instruments for data collection were the Social Studies Achievement Test (SSAT) and the Social Studies Retention Test (SSRT). The instruments were validated by experts in Social Studies and the Measurement and Evaluation Department. Kuder-Richardson statistics were used to test the reliabilities, which yielded coefficient values of 0.66 and 0.64, respectively. The mean and standard deviation were used to answer the research questions, while Analysis of Variance (ANCOVA) was used to test the hypotheses at the 0.05 level of significance using the Statistical Package for the Social Sciences (SPSS). The findings revealed that students taught using the ICT instructional strategy achieved significantly higher results ($F(1, 138) = 427.07$, $p = 0.00$, partial eta squared = 0.78), with a higher retention rate ($F(1, 138) = 428.76$, $p = 0.00$, partial eta squared = 0. 83) than those taught using the lecture method, while gender had no significant influence ($F(1, 72) = 0.02$, $p = 0.90$, partial eta squared = 0.00). The researchers recommended that teachers should be digital and consistently adopt a learner-centered instructional approach, as it encourages students to actively participate in class and achieve greater learning outcomes.

Keywords: Information and Communication Technology (ICT), Online learning platform, Google Classroom, Zoom, Management and Planning, achievement and retention.

INTRODUCTION

The ability to incorporate Information and Communication Technology (ICT) in content delivery is one of the characteristics of a 21st-century teacher. 21st-century teaching involves the use of appropriate instructional strategies that will capture the interest of the learners as well as deliver the learning objectives (Opara & Agbarakwe, 2022). The 21st-century teacher is expected to be equipped with skills that will make instruction appealing to students, arouse their interest, and improve their understanding and retention. Today's teachers must remember that the learners must take delight in what they are being taught and must therefore employ innovations in content delivery to achieve this objective.

Social Studies is an empowerment study in our society because the course is interested in how ideas are transformed into designed and impactful outcomes that improve societal peace. It is important to note that

rapid technological changes, globalization, and evolving social needs are essential in building resilient organizations and sustainable development (Sara, 2018). Lopez et al. (2021) opine that ICT may enhance, supplement, and improve the education process. As the leading United Nations organization for education, UNESCO directs global initiatives to assist nations in comprehending the part that such a technology may play in accelerating progress towards the Sustainable Development Goal 4 (SDG4), a goal encapsulated in the Qingdao Declaration (Jack, 2021). It is crucial that we change the way we teach today because technology has impacted almost every aspect of our lives.

Social Studies is one important subject that cuts across subjects in the humanities, social science, and other fields of life. It is the bedrock of national building and the queen of unity in a pluralistic society like Nigeria. The importance of the subject accords its position in Nigeria's educational system, which makes it a compulsory subject of which a student must study at the lower and upper basic school levels to inculcate the required norms and values of a particular society. The place of Social Studies in the life of any nation is the engine of social change, which is evolving and affecting all dimensions of life and national development. This is because no human society has ever been known to be static; rather, changes are inevitable (Mezieobi & Mezieobi, 2015). Meanwhile, the importance of Social Studies is not restricted to values and character development. It is also linked to the rebranding and character development of citizens of that nation, as it checks unwanted socio-economic changes such as deviant character, political violence, youth restiveness, and communal crisis that may lead to suspicion and hatred among ethnic groups, which are threats to the unity of the nation.

According to Opara et al. (2019), more emphasis is placed on Social Studies teaching approaches, and more time is allocated to its teaching and learning. Irrespective of these, the students still experience poor performance. The above has given great concern to the educational stakeholders, including the ministry, boards, and Social Studies teachers. The cause could be attributed or traced to many factors, such as teachers' quality, methods, students' attitude to learning, nature of the subject, availability of teaching resources, and teaching strategies, which deserve all the emphasis. It's noted that most Nigerian students do not have in-depth knowledge or thinking skills to pursue their personal lives, careers, or national economic competitiveness. Also find it difficult to engage in complex problem-solving activities and to apply school knowledge and skills to real-life problems in areas of need (Opara & Agbarakwe, 2022).

The use of ICT in Social Studies education can enhance students' ability to concentrate better on both practical and theoretical work. It also raises the profile of Social Studies education as a subject within the establishment by making it not only interesting, but also affectionate, attractive, and effective (Ukessays 2018). Furthermore, it brings enthusiasm and motivation for both Social Studies Education teachers and students. Integrating ICT in teaching and learning boosts achievement, allows visual observation, improves perception, and speeds up learning and retention (Ibode & Olamigoke, 2018). Through creative and collaborative labour, parents can support their wards' learning at home when teachers thoughtfully integrate ICT into instruction. Lawrence and Tar (2018) claim that when ICT is used in the teaching process, teachers act as assistants and instruct students as they do their assignments. There is a chance for improved communication between instructors and students. Teachers can use ICT tools to create presentations or other projects, quizzes, deliver online lessons, manage students' learning activities, and provide timely feedback to learners. Unprecedented global events, such as the COVID-19 pandemic and insecurity, have made the integration of ICT, such as online learning, necessary and compulsory rather than optional in the education sector.

Online learning platforms such as Google Classroom, Moodle, Canvas, Zoom, and social media are applications that teachers can use to deliver instruction, manage learning activities, and offer students access to learning experiences without time and geographical barriers. Some online learning platforms enable either asynchronous (teacher-student interaction at different times), synchronous (teacher-student interactions at the same time), or both asynchronous and synchronous (hybrid online learning platforms) interactions. Educators can use asynchronous platforms such as Google Classroom and synchronous platforms such as Zoom to help learners get a holistic learning experience and engage fully in online learning activities. Also, learners who cannot attend synchronous sessions (due to work, time zones, and other factors) can interact with recorded lectures or interactive synchronous sessions to get a full learning experience. There is evidence that getting

students engaged within the learning experience is a factor that enhances student success (Jack, 2021). Delivering Social Studies instruction through Zoom and Google Classroom can help educators to inspire students to take action, demonstrate correct techniques, and develop students' understanding and knowledge of the subject. By reviewing video footage of their own actions, students evaluate and improve their performances (Opara et al., 2019).

Hence, Qaddumi et al. (2021) maintain that incorporating ICT facilities into teaching and learning has given teachers and students the ability to provide more effective and efficient learning, which has several benefits for the nature and purpose of educational institutions. The level of technological innovations in instructional delivery is rapidly increasing; therefore, using ICT-based instruction should be given more attention at all levels of education (Okuneye et al., 2018). Despite the overwhelming prospects of ICT in education, available literature shows that there is poor utilization of ICT, especially online learning platforms, in Social Studies content delivery. For instance, Asana et al. (2021) stated that teachers' awareness and level of utilization of ICT resources for teaching Social Studies Education in Nigeria is low. Furthermore, there is a paucity of literature on how ICT, such as the combination of two online platforms, can help improve student achievement and retention in Social Studies Education, especially at the Alvan Ikoku Federal University of Education Owerri, Imo State. Hence, there is a need to evaluate the effect of the use of ICT in content delivery on students' achievement in Social Studies Education.

Statement of Problem

It has been observed with dismay that in the past five years, Nigerians have witnessed dramatic oppression and killing from Boko Haram, Headsmen, bandits, unknown gunmen, and other forms of political violence. Despite the uninterrupted transition into democracy since 1999**,** conflicts among ethnic groups, insecurity of life and property, corruption, kidnapping, religious crisis, vandalism of public facilities that may cause confederation and secession, and suspicion and hatred among the various ethnic groups are common. These are numerous problems facing Nigeria at present, calling for rebranding, attitudinal change, and positive social change, which Social Studies education can address. Information and Communication Technologies (ICTs) offer innumerable potential in enhancing the quality and quantity of Social Studies teaching and learning at all levels of education, especially tertiary institutions, to address negative attitudes that may lead to societal unrest and insecurity. It has been observed that effective integration of ICT transforms how education is delivered and promotes new opportunities, enhancing scholarship and competencies. This can only be attained when facilitators and students are exposed to their use in teaching and learning. Hence, integrating the values inherent in sustainable development and rebranding processes into teaching and learning is a challenging one in Social Studies education. Moreover, observation shows limited information and practice regarding the use and effect of integrating information and communication technology instructional strategies to improve learners' achievement and retention. There is a need for empirical findings on the integration of Information and Communication Technology (ICT) as a tool for enhancing teachers' effectiveness in Nigerian Universities that are lacking.

Therefore, this study wants to find out the effects of integrating information and communication technology (ICT) in lesson delivery on Social Studies students' achievement and retention at the Alvan Ikoku Federal University of Education, Owerri, Imo State.

Objectives of the Study

The objectives of this study were to:

1. determine the effect of ICT on Social Studies students' mean achievement score'
2. ascertain the effect of ICT on Social Studies students' mean retention score;
3. compare the mean achievement score of male and female Social Studies students using ICT.

Research Questions

The following research questions guided the study

1. What is the effect of ICT on Social Studies students' mean achievement score?

2. How does ICT affect Social Studies students' mean retention score?

3. How do the mean achievement scores of male and female Social Studies students using ICT compare?

Hypotheses

The following null hypotheses were tested at the 0.05 level of significance

Ho1. There is no significant difference between the mean achievement scores of students taught Social Studies concepts with ICT and those taught with the lecture method.

Ho2. There is no significant difference between the mean retention level of students taught the Social Studies concept with ICT and those taught with the lecture method.

Ho3. There is no significant difference between the mean achievement scores of male and female students taught Social Studies concepts with ICT.

LITERATURE REVIEW

Information and communication technology integration is defined as the use of ICT resources (such as the internet and e-learning technologies) to support teaching and learning (Jegede et al., 2019). Asubiojo and Aladejana (2019) argue that ICTs can now serve as a justification and a tool for advancing both old and new educational aims that have eluded us for a long time. Technology will be more beneficial if sufficient resources, careful effort, and patience are invested. ICT integration, according to Garba et al. (2018), is the process of introducing, reinforcing, enhancing, and extending capabilities.

Digital technologies have spread rapidly in many parts of the world (Cenamor & Frishammar, 2021) and are affecting the way we learn, live, and do business. Digital technologies have frequently accelerated growth, increased opportunity, and enhanced lesson delivery. Their combined influence, nevertheless, has been insufficient and unevenly dispersed (Selwyn & Heffernan, 2021). To effectively integrate ICT, all nations, regardless of economic standing, must acknowledge the trend toward pervasive use of ICTs; this calls for learner-centered attitudes and values. In recent times, universities employ a wide range of ICT resources to communicate, produce, distribute, store, and manage information. (A'mar & Eleyan, 2022).

ICT has, in some contexts, become crucial to the teaching-learning interaction through strategies like switching from chalkboards to interactive digital whiteboards, using students' own smartphones or other devices for learning during class time, and the ICT model, where students watch lectures at home on the computer and use class time for more interactive exercises (Opara et al., 2019). ICT can help students develop higher-order thinking skills, give them unique and creative ways to express what they have learned, and better prepare them to deal with ongoing technological change in society and the workplace (Iyamu et. al., 2019). Arkorful et al. (2021) believe that by using ICT, students are able to make content that builds upon and refers to sources that are more in-depth than those found in textbooks for the classroom. The internet helps teachers stay up to date on best practices and create lessons that provide pupils the chance to study more deeply. Students can produce a document, film, podcast, or presentation that indicates a stronger comprehension of their subject matter after receiving the right teaching(s).

The most common teaching method in many schools in Nigeria presently is the “talk-chalk method”, lecture, or didactic method. This method is also called the traditional or conventional method; some scholars refer to it as “one size shoe fit all”, the expository method, or the lecture method (Opara et al., 2019). The conventional lecture method involves teacher-student interaction where the teacher makes a verbal presentation of ideas and

facts to the students. The teacher lectures, gives facts, opinions, and overviews of the instructional content, asks questions, and provides solutions to the questions. The students learn these ideas and facts by memorization. The teacher is known as the "fountain of knowledge" that passes on the pieces of this knowledge to the students didactically (Opara & Agbarakwe, 2022). In this method of teaching, the teacher transmits information (Subject matter, content) verbally to his students, sometimes writing on the blackboard or using instructional materials. The students listen and take notes of facts and ideas that are considered important, sometimes asking questions to the teacher for further clarification (Opara et al., 2019). This method basically creates one-way communication that is from teacher to student, does not create immediate feedback, and also dull during instruction. The lecture method requires speaking ability from the teacher, which often results in passive learners who do not have the opportunity to clarify ideas. These are the reasons scholars recommend the integration of digital tools or blended learning in teaching and learning processes.

Blended learning is a mixture or combination of ICT-based and non-ICT learning approaches. It is the use of a combined approach to teaching methods and the learning process in education. According to Opara, Nwanekezi, and Mezieobi (2019), blended learning is a teaching approach that combines online digital learning with the traditional classroom instructional method. Thus, to enhance effective teaching, it requires the physical presence of the teacher and learner, which permits some element of learners' control over time, pace, place, or path in teaching and learning processes. Meanwhile, students still attend the normal "brick and mortar" schools with the teacher's presence, the practices of face-to-face classroom instruction are combined with computer-aided teaching activities regarding content and teaching delivery (Ncharam 2017). As blended learning means a different thing to different scholars in education had resulted in a lack of consensus on a definition and has led to difficulty in research on its effectiveness in the classroom. Blended learning has been described as a highly context-dependent, and therefore not a universal, conception that makes it difficult to manage, but it is a learner-centered, oriented method of teaching and learning that is not gender-biased.

The issue of gender difference in school performance has attracted the attention of scholars, and the literature on this issue is filled with conflicting reports. Scholars like Iwuji (2017) held the view that the socialization process could be responsible for the seemingly gender difference in achievement tests. Biologists such as Graz (2017) emphasized genetic and hormonal differences as factors that determine or influence behaviour as well as performance in aptitude tests across genders. To disentangle the influence of sex (gender) on academic performance is a complex task; thus, many studies appear to be contradictory. Many scholars believe that gender plays a role in life ambitions as well as career pursuits. This has also translated into the choice of school subjects and performance in them. Iwuji (2017) claims that females performed poorer in aptitude tests requiring mathematical, mechanical, and spatial ability. However, attributes such as behaviour serve different functions in Nigerian society, which do not give females the opportunity to exercise mental capabilities in certain areas of learning.

Gender refers to socially constructed roles and learned behaviours and expectations associated with males and females (Okeke, 2017). According to Dogru and Kalender (2017), gender connotes masculinity and femininity. Gender is a socio-economic variable used to analyze roles, responsibilities, opportunities, and needs. However, the social construction in society has been established and handed down through the various agents of socialization, which include family, community, religious environment, education system, language, and media.

The relative newness of Social Studies in Nigeria in general and in Nigerian Schools in particular, coupled with the varieties of persons, professional Social Studies educators and non-professionals or "generalist" Social Studies personnel, who are associated with Social Studies, have led to an "overdose" of Social Studies definitions. According to Opara et al. (2019), Social Studies is a national development from man's interaction and exploitation of the environment in which he lives. Social Studies focuses on the real experiences man encounters as he relates to the various aspects of his environment. This may be out of the belief that no man is isolated; therefore, the need to develop faith, self-expression and confidence, and the ability and skill to learn about issues and problems about themselves and their immediate and remote society. Mezieobi and Meziobi (2015) described Social Studies as an integrated study of man and his environment which inculcates in the

learners' cognitive skills, abilities, competencies, attitudes, and values that will enable him to become an informed, rational, analytic, participative, and functional citizen in his environment and beyond.

Ahmad (2017) opined that Social Studies is the investigation of human activities; it studies man at home, work, polities, village, nation, and everywhere he engages in his busy programmes of living. In a similar perspective, Okocha (2016) considered Social Studies as a study of man in his totality. It focuses on developing the right values, attitudes, and abilities, and helps the child to get on well with others as he grows up to become a responsible citizen. Another useful explanation of the concept of Social Studies, as provided by Ololobou (2015), states that the study of Social Studies is the integration of man as he battles for survival in the environment for the purpose of promoting awareness, appreciation, and understanding of the reciprocal relationship between man and the environment. This implies that the essence of studying Social Studies is to make learners functional and all-rounded citizens; then what makes Social Studies a unique discipline? The uniqueness of the subject matter (Social Studies) is evident in the essential features which distinguish it from other subject areas, as aptly recognized by (Ololobou, 2015). They include the following:

"It is a study of man as he interacts with the environment, Social Studies it value-based reflecting the three domains of learning, Social Studies is a citizenship education, inquiry is the core of all teaching and approaches in Social Studies, it is an integrated knowledge where information is drawn from a variety of sources". P. 89

Adaralegbe (2015) defines Social Studies as the modern attempt at interdisciplinary and interrelated study of a topic, a problem and issues, a concern and an appreciation, to him. Social Studies is a problem-approach through which man studies and learns about problems of survival in his environment. Adeyemi (2015) viewed Social Studies as the subject through which man learns about the problem of survival.

To Kissock (2018), Social Studies is a programme of study which society uses to instill in students the knowledge, skills, attitudes, and actions in relation to their culture and values. It considers the relationships human beings have with each other, their world, and themselves. The goal of Social Studies is to transmit citizenship, which intends that certain behaviour, knowledge, attitudes, and values that are required by the culture of the society in which the school is meant to operate are to prepare learners for effective citizenship. The purpose of Social Studies, therefore, is essentially man, society, and the environment, and its ultimate goal is to equip individuals with knowledge and understanding for effective relationships and living (Okojie, 2018). Social Studies education is the totality of experience and understanding a child gets having been exposed to a course of studies based on man's problems, which confront him daily as an individual and as a member of a social group or society. It therefore offers a richer preparation for life.

Generalizing the context of Social Studies as defined by various scholars, one can patiently define it as an integrative field of study which probes man's symbiotic relationships with his environments, endows man with the reflective or contemplative capacities, intellectual, affective, social and work skills, to enable him to understand his world and its problems, and to rationally solve or cope with them for effective living in society.

Theories in the field of social sciences or education are scholars who have studied social life in depth, as well as educational disciplines that relate to how social concepts are organized and programmed for understanding. This study is anchored on Marck Prensky Theory of how Digital Natives learn; Jerome Bruner's Theory of Constructivism, which is mainly founded on learning as an active process in which learners construct new knowledge or concepts based on their current/past experience. And Mark theory of how digital natives learn has exposed the necessity of theoretical perspectives in this 21st-century teaching and learning that are learner-centered.

Numerous studies have impacted the integration of information and communication technology in lesson delivery, learning, and teaching. Studies have been carried out showing deferent elements, access to ICT infrastructure, teacher proficiency, and technical support had a substantial impact on how ICT was integrated into teaching and learning. Such as Graz (2017); Etudo-Uyo (2014); Ncharam (2017); Dogru and Kalender (2017); Opara and Agbarakwe (2022); and Opara, Nwanekezi, and Mezieobi (2019) conducted a study on the effect of ICT learning and lecture method on students' performance and retention in Social Studies. In the

present research, the researcher carried out the study in AIFCE Owerri, Imo State, Nigeria. Lectures are video(s) recorded in a way in which the students would have access to lessons throughout the experiment. Finding: students in the ICT learning condition performed better than students in the lecture method class. Also, there was a higher rate of retention performance of students in the ICT condition than in the lecture method class. It was also revealed that there was no significant difference between male and female students' performance and retention when ICT instruction was applied. Asana et al. (2021) noted in their study on the use of ICT in education that while ICT is advancing in developed Western nations, its use in education is still lagging in Africa and other developing nations.

However, despite being in the early stages, a survey on ICT usage in South African schools found that the country had made substantial strides toward the integration of ICT in classrooms. In light of these findings, Ghana has made progress through the Ministry of Education in recognizing the role played by ICT in education, noting that a nation needs an ICT-literate workforce in the current globalized economy to increase its participation in the knowledge economy. Boahen and Atuahene (2021) examined the teachers' and students' perspectives on the effects of ICT integration in Kumasi High Schools, Ghana. According to the study, ICT has a wide range of educational applications and is influencing education by altering the teaching and learning processes. By incorporating ICT into their teaching and learning processes, schools are working to take advantage of its potential. The study's conclusions showed that while the majority of teachers had a strong desire to include ICT in teaching and learning, there were a number of issues and difficulties with doing so in schools. The study also identified internal hurdles linked to teacher cognition and external barriers related to teacher access to ICT, environmental supports, and ICT literacy.

METHODOLOGY

This research used a Quasi-experimental design. The study area was Alvan Ikoku Federal University of Education Owerri (AIFUE). The population of the study was 200 (76 males and 124 females) second-year students in the Social Studies Department, Alvan Ikoku Federal University of Education Owerri, Imo State. The sample size was 133 (experimental group = 67 and control group = 66 students) students purposively selected from two intact classes. The purposive sampling technique allowed the researchers to select only the students who had a hundred percent class attendance during the research period for the study. The instruments for data collection were the Social Studies Achievement Test (SSAT) and Social Studies Retention Test (SSRT). The instruments were validated by experts in the Social Studies Department and Measurement and Evaluation. Kuder-Richardson method was used to test the reliabilities, which yielded coefficient values of 0.81 and 0.83, respectively.

The researchers administered the SSAT as a pretest to the students in the control and experimental groups before instruction. During instruction, the students in the control group were taught SES 206.2 (Culture and Stability) course for eight weeks in their normal class setting using the lecture method, while the experimental group was taught the same course through Zoom meetings and Google Classroom. During the instructional period, the course lecturer delivered the course content and had real-time discussions and feedback with the students through Zoom, and used Google Classroom to post recorded Zoom sessions, announcements, and assignments to the students, and reviewed the students' submitted assignments. After the eight-week instructional period, the researchers re-administered SSAT as a post-test to the two groups and waited for three weeks before administering SSRT to test the students' level of knowledge retention.

The mean and standard deviations were used to answer research questions, while Analysis of Covariance (ANCOVA) was used to test the hypotheses at the 0.05 level of significance using the Statistical Package for the Social Sciences (SPSS). ANCOVA helped to increase the power of the test because of errors that may occur due to non-randomization of the participants of the study.

RESULTS

Research Question 1: What is the effect of ICT on the students' mean achievement score in Social Studies?

Table 1. Mean and Standard Deviation of Achievement for ICT Classroom and Lecture Instructional Strategies.

Strategies	N	Pretest Scores		Posttest Scores		Mean Difference
		$\overline{X}$	SD	$\overline{X}$	SD	
ICT	67	39.09	6.25	79.89	8.94	35.01
LM	66	36.95	6.07	44.88	8.59	

Table 1 results showed a pretest mean score of 39.09 and a posttest mean score of 79.89, which implies that ICT-based classroom instruction is an effective method of teaching Social Studies Education. However, the posttest mean achievement scores of students taught using ICT in the experimental group were 79.89, while the students taught using the lecture method in the control group had 44.88, giving a mean difference of 35.01 in favour of the experimental group taught using ICT. Students taught the Social Studies concept using ICT achieved better results than their counterparts taught using the lecture method of instruction.

Research Question 2: How does ICT affect students' mean retention score in Social Studies?

Table 2. Mean and Standard Deviation on Retention of ICT-based Classroom and Lecture Method.

Strategies	N	Pretest Scores		Posttest Scores		Post Post–Test		Mean Difference
		$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	
ICT	67	39.09	6.25	79.89	8.94	83.35	9.12	39.35
LM	66	36.95	6.07	44.88	8.59	44.01	6.63	

Table 2 results showed a pretest mean score of 39.09, a posttest mean score of 79.89, and a mean retention score of 83.35, which implies that ICT-based classroom instruction effectively improved the learning retention rate of Social Studies students. However, the result indicated that the mean retention score of students taught using the ICT classroom method of instruction in the experimental group was found to be 83.35 with an SD of 9.12, while the students taught using the lecture method of instruction in the control group recorded 44.01 with an SD of 6.63, giving a mean difference of 39.35 in favour of the experimental group taught using ICT classroom instruction. Students taught Social Studies concepts using the ICT classroom learning approach had a significantly higher level of learning retention than their counterparts taught using the lecture method of instruction.

Research Question 3

What is the effect of ICT on male and female students' mean achievement score in Social Studies?

Table 3. Mean and Standard Deviation of Achievement of Male and Female Students Taught Using ICT in Classroom Instruction.

Gender	N	Pretest Scores		Posttest Scores		Mean Difference
		$\overline{X}$	SD	$\overline{X}$	SD	
ICT						
Male	28	38.07	6.17	83.28	9.13	2.82
Female	39	39.82	6.31	86.10	9.27	

Table 3 results showed male students' pretest mean score of 38.07 and posttest mean score of 83.28, while female students had a pretest mean score of 39.82 and posttest mean score of 86.10, which implies that ICT-based classroom instruction had an infinitesimal effect on gender when used in teaching Social Studies. However, the results showed that male students taught with ICT-based classroom instruction had a posttest mean achievement score of 83.28 with an SD of 9.13, while female students had 86.10, giving a mean difference of 2.82 in favour of female students.

Hypothesis 1: There is no significant difference between the mean achievement scores of the students taught Social Studies concepts with ICT and those taught with the lecture method.

Table 4: ANCOVA Summary for ICT Classroom and Lecture Method

Source	Type III sum of squares	df	Mean Square	F	Sig	Partial Eta squared
Intercept	14709.54	1	14709.54	188.91	0.00	0.61
Pretest	75.796	1	75.79	0.97	0.02	0.01
Method	33253.42	1	33253.41	427.07	0.00	0.78
Error	9265.85	138				
Total	538748.00	133				

The results in Table 4 showed a significant effect of ICT instruction on students' achievement in Social Studies concepts ($F(1, 138) = 427.07$, $p = 0.00 < 0.05$ alpha level, with a large effect size (partial eta squared = 0.78)) compared to the lecture method. This implies a significant difference between the mean achievement score of students taught the Social Studies concept with ICT (mean score = 79.89) and those taught with the lecture method (mean score = 44.88). Therefore, the researchers rejected the null hypothesis (H0). Thus, it is significantly more effective to use ICT than the lecture method in teaching Social Studies concepts.

Hypothesis 2: There is no significant difference between the mean retention level of the students taught Social Studies concepts with ICT and those taught with the lecture method.

Table 5 ANCOVA Summary for ICT Classroom and Lecture Method on Retention

Source	Type III Sum of Squares	df	Mean Squared	F	Sig	Partial Eta Squared
Intercept	31915.99	1	31915.99	563.54	0.00	0.76
Pre Test	289.721	1	289.72	5.12	0.03	0.28
Method	48565.13	1	24282.56	428.76	0.00	0.83
Error	10080.94	138	56.63			
Total	976758.00	133				

The results in Table 5 showed a significant effect of ICT instruction on students' retention level in Social Studies concepts ($F(1, 138) = 428.76$, $p = 0.00 < 0.05$ alpha level, with a large effect size (partial eta squared = 0. 83)) compared to the lecture method. This implies a significant difference between the mean retention level of students taught with ICT (mean score = 83.35) and those taught with the lecture method (mean score = 44.01). Therefore, the researchers rejected the null hypothesis stating that there is no significant difference between the mean retention levels of students taught Social Studies concepts with ICT and those taught with the lecture. Therefore, it is significantly more beneficial to use ICT than the lecture method to improve students' retention in Social Studies concepts.

Hypothesis 3: There is no significant difference between the mean achievement scores of male and female students taught Social Studies concepts with ICT.

Table 6. Two-way ANCOVA Summary for Male and Female Students taught with ICT Classroom and Lecture Method.

Source	Type III Sum of Squares	df	Mean Squared	F	Sig	Partial Eta Squared
Intercept	14709.54	1	14709.54	188.91	0.00	0.61
Pre Test	75.79	1	75.79	0.97	0.34	0.01
Method	33253.42	1	33253.42	427.07	0.00	0.78
Gender	1.17	1	1.168	0.02	0.90	0.00
Method Gender	43.74	1	43.74	0.56	0.46	0.01
Error	9265.85	72	77.86			
Total	538748.00	67				

The results in Table 6 showed that there is no significant influence of gender ($F(1, 72) = 0.02$, $p = 0.90 > 0.05$ alpha level, with a negligible effect size (partial eta squared = 0.00)) on students' achievement in Social Studies when taught with ICT. Therefore, the researchers accepted the null hypothesis stating that there is no

significant difference between the mean achievement scores of male and female students taught Social Studies concepts with ICT. Also, the interaction effect of gender and method was insignificant and very small (F (1, 72) = 0.562, p = 0.46 > 0.05 alpha level, partial eta squared = 0.01), while the effect of teaching method was significant and large (F (1, 72) = 427.07, p = 0.00 < 0.05, partial eta squared = 0.78). Therefore, these results implied that gender did not influence students' achievement in Social Studies irrespective of the methods of instruction. The increase in students' achievement was due to the integration of ICT in Social Studies lesson delivery.

DISCUSSION OF FINDINGS

ICT and students' mean achievement score in Social Studies

The results revealed that students taught Social Studies concepts using the ICT classroom learning approach achieved better results than their counterparts taught using the lecture method of instruction. It showed a pretest mean score of 39.09 and a posttest mean score of 79.89, which implies that ICT classroom instruction is an effective method of teaching Social Studies. However, students taught with ICT-based classroom instruction had a posttest mean achievement score of 79.89, while those taught with the lecture method had 44.88. This implies that students taught Social Studies concepts using an ICT classroom has high mean achievement score than those taught using the lecture method. It means that students taught using an ICT classroom achieved better results, with a high mean difference of 35.01 compared to their counterparts. The hypothesis was statistically significant at the 0.05 level of probability. The present finding is in agreement with that of Opara, Nwanekezi, and Mezieobi (2019), who conducted a study on the effect of ICT learning and lecture method on students' performance and retention in Social Studies. In the present research, the researcher carried out the study at AIFCE Owerri, Imo State, Nigeria. Lectures are video(s) recorded in a way in which the students would have access to lessons throughout the experiment. Findings showed that students in the ICT-based learning condition performed better than students in the lecture method class. Also, there was a higher rate of retention performance among students in the ICT condition than in the lecture method class. It was also revealed that there was no significant difference between male and female students' performance and retention when ICT instruction was applied. Also, Graz (2017) and Etudo-Uyo (2014), who investigated in English and Etudo-Uyo (2014) investigated in primary science, which revealed that students taught using ICT performed better than their counterparts.

ICT and students' Mean Retention Score in Social Studies

The result revealed that students taught Social Studies concepts using the ICT classroom learning approach had a significantly higher level of learning retention than their counterparts taught using the lecture method of instruction. It indicated a pretest mean score of 39.09, a posttest mean score of 79.89, and a mean retention score of 83.35, which implies that ICT classroom instruction effectively improved the learning retention rate of Social Studies students. However, students taught with ICT classroom instruction had a mean retention level of 83.15, while those taught with the lecture method had a mean retention level of 43.71. There is a higher mean retention level of students taught Social Studies concepts using ICT classroom instruction than those taught using lecture method. This implied that students taught using the ICT strategy had a better and higher level of learning retention than their counterparts, with a mean difference of 39.44. The hypothesis was statistically significant at the 0.05 level of probability. However, the present result is in conformity with that of Asana *et al*. (2021), who noted in their study on the use of ICT in education that while ICT is advancing in developed Western nations, its use in education is still lagging in Africa and other developing nations. However, despite being in the early stages, a survey on ICT usage in South African schools found that the country had made substantial strides toward the integration of ICT in classrooms. In light of these findings, Ghana has made progress through the Ministry of Education in recognizing the role played by ICT in education, noting that a nation needs an ICT-literate workforce in the current globalized economy to increase its participation in the knowledge economy. Dogru and Kalender (2017) found that students exposed to ICT-based instruction showed a better and higher level of retention than those taught with a traditional teacher-centered approach. Also, in accordance with the study of Ncharam (2017), maintained that student taught with ICT-based instruction maintained a higher level of retention than their counterparts.

Achievement score difference between male and female Social Studies students using ICT

The result showed that ICT-based classroom instruction had an infinitesimal effect on gender when used in teaching Social Studies. It was revealed that male students pretest mean score of 38.07 and a posttest mean score of 83.28, while female students had a pretest mean score of 39.82 and a posttest mean score of 86.10, which implies that ICT classroom instruction had an infinitesimal effect on gender when used in teaching Social Studies. However, male students had a posttest mean achievement score of 83.28, while female students had 86.10 when ICT teaching was applied. This means that female students achieved better results with ICT-based classroom instruction. The hypothesis was not statistically significant at the 0.05 level of probability. The results for male and female students when ICT-based teaching was applied are in line with those of Opara and Agbarakwe (2022) in their studies that revealed that female students performed better with flipped teaching. However, this finding was also confirmed by a related study by Boahen and Atuahene (2021) that examined the effects of ICT integration in Kumasi High Schools, Ghana–Teachers' and Students' perspectives. According to the study, Information and Communication Technology (ICT) has a wide range of educational applications and is influencing education by altering the teaching and learning process. By incorporating ICT into their teaching and learning processes, schools are working to take advantage of its potential. The study's conclusions showed that while the majority of teachers had a strong desire to include ICT in teaching and learning, there were a number of issues and difficulties with doing so in schools. The study also identified internal hurdles linked to teacher cognition and external barriers related to teacher access to ICT, environmental supports, and ICT literacy.

CONCLUSION

This study confirmed that the use of ICT causes a paradigm shift in the conventional beliefs and approaches to the teaching and learning process in Nigerian Universities. The study's findings revealed that students taught Social Studies concepts using an ICT instructional strategy had a higher mean achievement score than those taught using the lecture method. Also, students taught Social Studies concepts using the ICT classroom learning approach had significantly higher learning retention than their counterparts taught using lecture method. ICT-based classroom instruction did not affect gender when used in teaching Social Studies. Hence, some of the common advantages of ICT in education include: shifting from teacher-centered instruction to learner-centered instruction, which helps students become independent and self-directed in the acquisition and application of knowledge and skills; putting the emphasis on learning rather than teaching, which makes the learning environment for teachers and students more dynamic and engaging; and empowering students to take more responsibility for their education as they seek out independent learning opportunities, transforming lecturers' roles from merely knowledge transmitters to learning facilitators, knowledge navigators, and active co-learners with students.

RECOMMENDATIONS

1. There is a need for the Government, through the National Universities Commission (NUC) and other Education stakeholders, to respond positively and provide enough ICT infrastructure to all the Federal Universities across the country to encourage lecturers to integrate them into their teaching.
2. There should be teacher training programmes and skill development of teachers that will encourage them to have the requisite skills, competence, and exposure to enable them to be more proficient in the utilization of ICTs in teaching/learning activities. The Government can do this by partnering with other organizations to provide training, and such training or workshops should be periodic.
3. Emphasis should be given to the pedagogy behind the integration of ICTs for teaching/learning activities.
4. Educators should combine synchronous and asynchronous online learning interactions for effective instructional delivery, improved students' achievement and retention.
5. Further studies should compare the effect of the different modes of online learning interactions on students' achievement and retention.

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Ethical Approval: The study posed minimal risk and adhered to ethical guidelines for social science fieldwork. Formal approval from an Institutional Review Board was not required under the policies of the University of Port Harcourt, Nigeria. Informed verbal consent was obtained from all participants, and all data were anonymized to protect participant confidentiality.

Conflict of interest: The authors declare no competing interests.

Data availability statement: The data that support the findings of this study are available from the corresponding author upon request.