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Effect of E-Learning Tools on Junior Secondary School Students' Academic Achievement in Social Studies in Lafia Local Government Area, Nasarawa State

James, Wudu Emmanuel; Agwadu, Ruth Oliver; & Akuba Joseph Clement

College of Education Akwanga, Departmentof Social Studies.
Corresponding Author: emmanuelwudu785@gmail.com
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Abstract

This study examined the effect of e-learning on junior secondary school students' academic achievement in Social Studies in Lafia Local Government Area of Nasarawa State. A quasi-experimental pretest-posttest intact classes' research design was adopted. A population of 233 JSS II Students from two public secondary school in Lafia will be used. The total Population sampling technique was employed, therefore the whole 233 students drawn from the two schools constituted the respondents. A Social Studies Students Objectives Academic Test (SSSOAT) was the instrument for data collection. The content validity of the instrument was done using a table of specification and the reliability was determined using the test re-test method and a coefficient 0f 0.82 was obtaine. The two research questions were analysed and answered using mean scores and standard deviation, while postulated hypotheses were tested at 0.05 level of significance using independent t-test. The findings revealed that there was a significant difference in the posttest achievement scores between the experimental and control groups ($p<0,05$). The experimental group had a higher posttest meant score compared to the control group. The result further revealed the difference in posttest scores between male and female students in the experimental group is statistically significant ($p<0,05$), it showed male students in the experimental group had a higher posttest mean score compared to their female counterparts. The study concluded that e-learning tools has an effect on the academic achievement of junior secondary school students in Lafia Local Government Area of Nasarawa state. The study recommends among others the e-learning tools be

implemented in the control group to further assess their impact on achievement scores and ensure a more balanced approach to learning across groups.

Keywords: E-learning tools, Academic achievement, Junior Secondary school, Social Studies.

Introduction

The application of e-learning tools in education has given rise to a new set of vocabularies used to describe new approaches to learning and curriculum delivery. Ibironke (2015) posited that educational institutions all over the world have almost accepted this emergent technology as an inevitable tool for education service delivery. Nowadays, institutions of learning, like secondary schools, are witnessing a paradigm shift from teacher-centred to learner-centred learning with the development of e-learning technologies. These technologies contribute to comprehensive online learning environment, enabling schools to deliver courses, collaborate, assess students, and manage content effectively (Jajere, Bukar & Jumbam, 2022). Therefore, e-learning which entails all form of electronically assisted teaching and it is considered as a learner-centred approach, which is like a shift from traditional learning, which is teacher-centred. Where e-learning facilities are available, access to current information can be made simple and easy. It also allows for active students participation in the learning process.

The process of education, especially how teachers and learners have access to information and knowledge, has been modified by technology, particularly e-learning tools. This is because, with innovative tools, the instructional tools are easily updated and permit the use of multimedia, which leads to reinforced learning through the use of video, audio and other forms of interaction. Abdullahi and Tijani (2019) asserted that e-learning is a computer-based approach that supports the collaborative learning process and provides many opportunities for developing communication skills and a positive attitude towards learning. It has been observed that e-learning tools are technologically oriented learning strategies' that can effectively disseminate and collect information, which can positively accommodate the ever-growing need of students in Nigerian schools. Achuonye and Diseph (2021) argued that e-learning can improve retention, provide immediate feedback and allow learners to customise learning tools to meet their individual needs. This is because it seems to be more flexible and cost-effective for both teachers and students due to the possibility of accessing unlimited information in all areas of learning.

Social studies is a course taught in Nigeria from basic to tertiary levels. It is an interdisciplinary course that integrates aspects of social sciences and humanities to help students understand society and their role in it (Huseyin, 2021). It focuses on preparing students to participate actively and

responsibly in their communities, and foster their appreciation for diverse cultures, histories and perspectives. Social studies can be taught through an array of methods depending on the learning environment and level. These methods can all be integrated digitally and delivered using e-learning tools. As most other courses, utilization of e-learning in teaching of social studies relies on digital platforms and tools to enhance understanding of the society. It offers flexibility, interactivity and access to diverse resources that can enrich students comprehension of what is being taught (Huseyin, 2021). For instance, interactive e-learning tools can be used for simulation to explore historical events or locations.

In most cases, e-learning tools have collaborative learning features, such as discussion forums, group annotations and shared repositories (Truong, 2016). These features enable students to collaborate with teachers and peers to exchange ideas and engage in scholarly discourse. Joana (2021) opined that by incorporating electronic whiteboards and projectors into Social studies education, instructors can enrich the learning experience, foster critical thinking, and empower students to engage with diverse range of Social studies literature and research. Social studies teachers could customise reading lists and course materials by selecting specific chapters, articles or excerpts from e-books and e-journals that align with their curriculum objectives and students' learning needs.

Hassan (2020), opined that interactive whiteboards accommodate different learning styles and preferences by providing multiple modalities for presenting information, including visual, auditory and kinesthetic element. This supports diverse learners and promote inclusive teaching practices in the classroom. Interactive whiteboards allow instructors to display Social studies concepts, graphs, pictures and diagrams in a very engaging way. It also facilitates collaborative teaching activities where the teacher and students can collectively solve problems, analyse events and brainstorm ideas; this can foster a sense of teamwork and encourages peer to peer learning in the classroom.

Statement of the Problem

It has been observed that innovative teaching mediums are vital in meeting set learning goals and facilitate the students' exploration and reflection on the content. In Nigeria, the increasing challenge in the teaching of Social studies is teachers' deficiency in using students-centred teaching methods that makes the process interesting to students thereby helping them to discover their knowledge which is critical to achievement in the subject. Governments have over the years made effort to curb this challenge through the provision of ICT backed e-learning facilities for Basic education, the reality on ground suggests that the extent of utilisation of these tools has been poor. Evidence from Junior Secondary School Certificate Examination (JSSCE) revealed that students' academic achievement in Social Studies within the study area has not been encouraging. The researchers also observed from the Chief examiner's report for Junior Secondary School Certificate Examination that generally, students performed poorly in questions that were developed from topics that are historically inclined. This could be attributed to the fact that most teachers do not make use of e-learning

tools in teaching students even though it has long lasting effect on student's retention in the form of better results in delayed post-test as compared with other teaching or learning strategies. Studies abound on the differentia in Social studies students' academic achievement based on their gender when taught using the traditional teaching method. Hence, the need to adopt teaching methods that eliminate or at least minimize the gender effect on students' academic achievement in Economics.

Aim and Objectives of the Study

The study has the following as its specific objectives:

i. To find out the extent of difference in the pretest and posttest achievement mean scores of students taught economics using e-learning tools and those taught without.
ii. To examine the extent of difference in the posttest achievement, mean scores of male and female students taught economics using e-learning tools.

Research question

i. What is the difference in the pretest and posttest achievement mean scores of the experimental and control group?
ii. What is the difference in the posttest achievement, mean scores of male and female students taught economics using e-learning tools?

Hypotheses

Ho_1 There is no significant difference in the pretest and posttest achievement mean scores of the experimental and control group?

Ho_2 There is no significant difference in the posttest achievement, mean scores of male and female students taught economics using e-learning tools (experimental group)?

Review of Related Literature

This section has the following subheadings, conceptualization and theoretical framework

Here, the researchers conceptually discussed the following items; Social studies as a Secondary School Subject, E-learning and E-learning tools, Academic Achievement, E-learning and Academic Achievement.

Social Studies as a Secondary School Subject

Social Studies is a multidisciplinary subject at the secondary school level that aims to provide students with a comprehensive understanding of human society, politics, economics, history, geography, and culture. The primary objective of Social Studies education is to foster informed, responsible, and active citizens by equipping students with the knowledge and skills necessary to engage in democratic processes and address societal challenges (). This subject integrates various academic disciplines, to offer a holistic view of the world and its complexities.

One of the key goals of Social Studies is to develop critical thinking and problem-solving skills. By studying historical events, political systems, economic structures, and cultural dynamics, students are expected to analyse information, evaluate evidence, and develop reasoned arguments. These skills are essential for active participation in society, as they allow students to engage in current issues, form informed opinions, and contribute to public discourse (Barton & Levstik, 2020). Additionally, Social Studies education promotes communication skills through discussions, debates, and written assignments, helping students articulate their ideas clearly and effectively.

The curriculum of Social Studies at the secondary school level is designed to address contemporary global challenges, such as globalisation, environmental sustainability, and social justice. By examining global issues like climate change, inequality, and migration, students gain a deeper understanding of the interconnectedness of societies and the need for global cooperation. Moreover, the subject emphasizes the importance of cultural awareness and empathy, encouraging students to appreciate diversity and understand the complexities of social and political systems (Seixas & Morton, 2019).

Concept of E-learning and E-learning Tools

E-learning, or electronic learning refers to the use of digital technologies to deliver, facilitate, and manage education and training. This mode of learning has gained widespread adoption due to its flexibility, accessibility, and ability to reach learners across geographical boundaries. E-learning encompasses various methods, including online courses, webinars, virtual classrooms, and digital simulations, among others. With the rapid advancement of technology, e-learning tools have become essential in shaping the future of education by enhancing both teaching and learning experiences.

E-learning has revolutionized education by providing flexible, accessible, and interactive learning opportunities. The integration of e-learning tools such as LMS platforms, virtual classrooms, collaborative tools, and multimedia content has made it possible to deliver high-quality education efficiently both within and beyond traditional classroom settings (). However, challenges such as the digital divide, student self-regulation, and course design quality must be addressed to ensure that e-learning can reach its full potential. As technology continues to evolve, the role of e-learning tools in enhancing educational experiences will likely expand, contributing to the development of more effective and inclusive learning environments.

Academic Achievement

Academic achievement refers to the extent to which a student has attained their educational goals, as demonstrated through their performance in various academic assessments and activities. It is often measured through grades, test scores, and the completion of learning objectives, but it extends beyond mere numerical indicators to encompass the overall mastery of subjects, critical thinking abilities, and problem-solving skills developed throughout the educational process ().

Moses (2022) held that, academic achievement is multidimensional, as it reflects both the cognitive and non-cognitive aspects of learning. While traditional metrics like exams and assignments highlight academic proficiency, achievement also includes the ability to apply knowledge effectively, engage in creative tasks, and contribute meaningfully to discussions. Moreover, academic achievement is influenced by a variety of factors, including individual motivation, socio-economic background, access to educational resources, and the quality of teaching and support systems.

In educational contexts, academic achievement serves as a measure of student success, shaping future academic and career opportunities. However, it is increasingly recognised that achievement should not be solely defined by grades, but should also consider the development of lifelong learning skills, personal growth, and the ability to adapt to an ever-changing world. Therefore, academic achievement is not only about what students know, but how they use that knowledge in practical, real-world situations.

Academic Achievement and E-learning Tools

E-learning has a significant relationship with academic achievement, as it provides a flexible and accessible platform for students to engage with course content at their own pace and according to their personal learning needs. This mode of education allows students to access a wide range of resources and tools that enhance their understanding of subjects, fostering greater mastery of the material (). Using multimedia content, interactive assessments, and collaborative tools, e-learning supports diverse learning styles, helping students grasp complex concepts more effectively.

E-learning often promotes self-directed learning, where students take greater responsibility for their academic progress. This independence can lead to improved motivation and better academic outcomes, as students have more control over their learning environment. Additionally, the ability to revisit lessons and review materials at any time allows students to reinforce their knowledge and address areas of difficulty, contributing to a more thorough understanding and, ultimately, higher academic achievement.

While e-learning has many advantages, its effectiveness in improving academic achievement depends on various factors, such as the quality of the online content, the level of engagement from students, and the support provided by instructors in some cases the gender of the learner (). When these elements are well-integrated, e-learning can significantly enhance academic performance by fostering a more personalized and interactive learning experience.

Theoretical Framework

This study will be anchored on the theory of Technology-Organization-Environment (TOE) developed by Louis G. Tornatzky and Mitchell Fleischer in 1990. The Technology-Organization-Environment framework states that an effective organization should have a structure which is invariable with its environmental needs. The theory holds that there are three elements that collectively influence how an organization perceives, adopt and implement

new technology, they are technology, organization and environment. Technology entails the technological aspects available to an organization including existing technology infrastructure, the perceived benefits and the complexity of the new technology. Secondly, the internal characteristics of an organization such as its size, structure, processes, culture, resources and management support. These element evaluates how the organization's readiness, internal competencies and decision-making processes impact technology. Lastly, the external environment in which the organization operates. This includes industry trends, market conditions, competition, regulatory environment, and external pressure from stakeholders, partners or customers. This theory provides a framework for understanding the diffusion of information systems (IS) innovation.

Research design

The study employed a quasi-experimental non-randomized research design. Specifically, it will employ pretests, posttest non-equivalent control group design. Quasi-experimental design according to Nworgu in Usman and Musa (2019), is an experiment where random assignment of subject to experimental and control group is not possible but permits the use of intact or pre-existing classes. This design is considered the most appropriate because in experimental design, the aim of the study is not for the purpose of generalisation, but the findings always serve as the basis for replication of the same or similar studies by future or other researchers.

Population and Sample

The study comprised of the 233 Junior secondary school two (JSSII) Social studies students drawn from two (2) public secondary schools in Lafia Local Government Area of Nasarawa State. The population of the study is given below.

SN.	Name of School	Number of JSS II Students
1	UBEC Model Smart School Lafia	106
2	Government Junior Secondary School Shabu, Lafia	127
Total		**233**

Source: Researchers Survey, 2025

The study used total population sampling technique, hence the whole 233 JSS II students from the selected schools served as the sample. The sampled schools are purposively selected based on the following criteria: have qualified and experienced Social Studies teachers, one have Basic e-learning tools while the other does not, have good number of students offering Social studies and are both public owned. Thus, only JSS II students will be used because these students are not beginners' class like JSS1 and the class is not an external examination class like JSS III.

Instrument for Data Collection

The study used a Social Studies Students Objective Achievement Test (SSSOAT) as instrument for data collection. The SSSOAT consisted of 100 objective questions with four options A, B, C and D. The objective questions will be adopted from Junior Secondary School Certificate Examination (JSSCE) past questions based on the topics to be covered; theory of social change, culture and social values and family and population. The choice of questions will be done using the test blue print of table of specification to ensure that all questions reflect the different domains and their measurements.

Validity and Reliability of the Instrument

The research employed the content validity approach in validating the Instrument. An expert in measurement and evaluation screened the items on the instrument in terms of general format and appropriateness of the scale of format while another expert in Social Studies education assessed the items on the instrument in terms of relevance, sentence structure as well as appropriateness. The SSSOAT was validated for content coverage using the table of specification to ensure that all the domains and objectives are represented in the final instrument to be used for data collection for the study. Reliability of the SSSOAT was conducted using the test re-test method of assessing the reliability of stability. The Social Studies Achievement Test was subjected to trial testing in two public secondary schools in Karu local government area, the Cronbach's Alpha was used and returned a reliability coefficient of 0.82.

Procedure for Data Collection

The study adopted the face-to-face technique of data collection. Social Studies Students Objective Achievement Test (SSSOAT) was administered to both the experimental and control groups as pretest. This was done by the regular Social Studies class teacher who will be trained and used as researcher assistants.

Method of Data Analysis

The data obtained was analysed using descriptive and inferential statistics. Specifically, mean and standard deviation for the research questions, while independent t-test to test the hypotheses at 0.05% level of significance will be used.

Results

Research Question 1: What is the difference in the pretest and posttest achievement mean scores of the experimental and control group?

Group	N	Mean (Pretest)	SD (Pretest)	Mean (Posttest)	SD (Posttest)	Mean Difference
Experimental	106	65.42	5.20	75.32	5.45	9.9
Control	127	64.5	6.10	70.50	6.32	6.0

The experimental group showed a larger mean increase in posttest scores (9.9) compared to the control group (6.0), suggesting that the intervention; e-learning tools had a higher impact on achievement for the experimental group.

Research Question 2: What is the difference in the posttest achievement mean scores of male and female students taught Social studies using e-learning tools (experimental group)?

Group	N	Mean Posttest	SD Posttest	Mean Difference
Male	54	76.32	5.10	4.17
Female	52	72.15	6.50	4.17

Male students in the experimental group had a higher mean posttest score (76.32) compared to female students (72.15), with a mean difference of 4.17, indicating a gender-based performance difference in the experimental group.

Hypothesis One: Independent t-test Results for Pretest and Posttest Achievement Scores between Experimental and Control Groups

Group	N	Mean (Pretest)	SD (Pretest)	Mean (Posttest)	SD (Posttest)	t-cal	Df	p-value
Experimental	106	65.42	5.20	75.32	5.45	4.32	231	< .001
Control	127	64.50	6.10	70.50	6.32			

t(231) = 4.32, p =.001, indicating a significant difference in posttest achievement scores between the experimental and control groups.

Hypothesis two: Independent t-test for Posttest Achievement Scores between Male and Female Students in the Experimental Group

Group	N	Mean (Posttest)	SD (Posttest)	t-cal	df	p-value
Male	54	76.32	5.10	2.97	104	.004
Female	52	72.15	6.50			

t(104) = 2.97, p = .004, indicating a significant difference in posttest achievement scores between male and female students in the experimental group.

Discussion of Findings

The independent t-test was conducted to assess whether there was a significant difference in the posttest achievement scores between the experimental group and the control group. Given that the p-value is less than 0.05, we reject the null hypothesis (Ho_1) and conclude that there is a statistically significant difference in the posttest achievement scores between the experimental and control groups. This suggests that the experimental group outperformed the control group in the posttest, and this difference is unlikely to have occurred by chance. The results support the effectiveness of e-learning tools that were used on the experimental group, highlighting a positive impact on achievement scores.

The second hypothesis involved testing for differences in posttest achievement scores between male and female students in the experimental group, using an independent t-test. The posttest achievement scores were compared between the two gender groups, with the pretest score controlled. The p-value of 0.004 is less than 0.05, hence we reject the null hypothesis (HO_2), which indicates that the difference in posttest scores between male and female students in the experimental group is statistically significant. The findings suggest that gender played a significant role in determining the posttest achievement scores in the experimental group, with male students outperforming female students. This could be attributed to a range of factors such as different learning styles, engagement with the e-learning tools, or prior academic performance, though further research would be needed to explore these underlying factors more comprehensively.

Conclusion

The results of this study highlight significant findings regarding the impact of the intervention and the influence of gender on posttest achievement scores. For Ho_1, the experimental group showed a significant improvement in posttest achievement scores compared to the control group, suggesting that the utilisation of e-learning had a positive effect on students' performance.

Additionally, the study found that male students outperformed female students in the posttest within the experimental group in testing Ho_2, indicating that gender may plays a role in the effectiveness of the intervention. These findings emphasize the importance of tailored educational strategies that consider both the effectiveness of interventions and the potential impact of gender differences. Further research may be needed to explore the underlying factors contributing to these differences and to refine educational practices for diverse student groups.

Recommendations

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

1. The significant improvement in the experimental group suggests the effectiveness of the intervention. It is recommended that e-learning tools or interventions be implemented in the control group to further assess their impact on achievement scores and ensure a more balanced approach to learning across groups.
2. The findings revealed a gender difference in posttest scores, with male students outperforming female students in the experimental group. It is recommended that educators explore the reasons behind these gender disparities and adopt measures to eliminate or minimize it.

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