

IMPACT OF TECHNOLOGY INTEGRATION AND GROUP-BASED LEARNING STRATEGIES ON STUDENTS ACADEMIC ACHIEVEMENT IN SOCIAL STUDIES IN OSUN STATE.

BY

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Abstract

This study aims to investigate the effects of technology integration and group-based learning strategies on junior secondary school students' academic achievement in Social Studies. The study's population consisted of 115,775 students in Osun State, with a sample of 187 Junior Secondary School Two (JSS II) students selected using a multistage sampling method. Two research instruments, the Achievement Test in Social Sciences (ATSS) and a Technology Integration Instructional Guide, were used to assess student performance. A quasi-experimental design with a pre-test and post-test control group was employed, and data were analyzed using descriptive and inferential statistics (ANCOVA). Findings revealed that the pre-test mean scores for students in the group-based learning group and technology integration group were 12.91 and 14.95, respectively, with a total mean of 14.42. After exposure to the instructional methods, the post-test mean scores increased to 15.51 for the group-based group and 17.25 for the technology integration group, with a total mean of 16.45. ANCOVA results showed no significant difference in students' academic achievement before the interventions ($F = 1.101, p > 0.05$), indicating homogeneity between the groups. However, post-test results indicated a statistically significant difference in achievement between students taught using technology integration and those taught using group-based learning ($F = 6.002, p < 0.05$). These findings suggest that while both strategies enhance learning, technology integration proved to be a more effective instructional method for improving students' academic performance in Social Studies.

Keywords: *Technology Integration, Group-Based learning method, Academic achievement, Social Studies.*

Introduction

The integration of technology in education has gained widespread acceptance globally, transforming how knowledge is delivered and acquired. In Social Studies, a subject aimed at fostering civic competence and social understanding, technology integration and group-based

learning strategies have become essential tools for improving learning outcomes. The shift from traditional teaching methods to digital tools, such as interactive software, multimedia presentations, and online collaborative platforms, has changed classroom dynamics, allowing for more engaging and student-centered learning experiences.

In Nigeria, the introduction of technology into education is part of the broader drive to improve the quality of education and meet international standards. According to the Federal Ministry of Education's National Policy on Information and Communication Technology (ICT) in education (2021), technology is recognized as a crucial element in modernizing the education system. Despite this policy, many schools in Osun State and other parts of Nigeria still face challenges in fully integrating technology into the learning process due to infrastructural deficits, limited teacher training, and inadequate funding.

Studies have shown the potential of technology in enhancing student learning outcomes when combined with effective teaching strategies.

A study by Adeoye and Ogedengbe (2023) in South-West Nigeria found that the use of educational technology, such as projectors and e-learning platforms, significantly improved students' performance in Social Studies compared to traditional chalk-and-talk methods. However, technology alone is not enough. The effective application of group-based learning strategies—where students work collaboratively to solve problems and engage with content—has been found to enhance critical thinking, cooperation, and retention of knowledge.

Internationally, the incorporation of technology and collaborative learning strategies has been extensively studied. For example, Johnson and Johnson (2019) argued that cooperative learning, supported by technology, fosters deeper understanding and improves communication skills among students. Moreover, Kirschner, Sweller, and Clark (2020) posited that group-based learning combined with the use of technology encourages active learning, resulting in better academic outcomes and student satisfaction. In a comparative study conducted in the United States, Zhao and Kuh (2021) demonstrated that students exposed to both technology and cooperative learning strategies had significantly higher engagement levels and academic performance than those exposed to traditional lecture-based methods.

In Osun State, where schools are gradually adopting technology, the role of group-based learning strategies in improving Social Studies outcomes cannot be overlooked. While there have been positive results in some schools, others still lag behind due to varying levels of technological access and teacher preparedness. According to Oyelakin et al. (2022), many teachers in rural schools still struggle to incorporate technology effectively due to lack of training and resources. However, where group-based strategies are used alongside available technology, students have shown improved collaboration and better understanding of social issues, suggesting a synergy between technology integration and collaborative learning.

Group-Based learning is a teaching learning approach that stresses that under adequate and suitable teaching settings, all learners can practically and collaboratively learn most of what

is taught in schools (Aggarwal, 2014). The GBL is based on the tenet that every learner is capable of gaining mastery of learned objectives, if the teaching instruction is approached methodically. That is if learners are helped when and where they have learning difficulties. And if they are given sufficient time to achieve mastery and a clear-cut criteria of what constitute mastery is made known to them. According to (Bloom, 2017), most students can master what the teachers teach them if the teaching is systematically manipulated. The instructional variables can be easily manipulated so that almost all learners achieve the prescribed level of mastery. Studies by (Block & Anderson, 2015), indicate that in many subject areas, all learners can achieve some defined level of mastery. It has been found that even gifted students need individual methods of study suited to their personality, rather than the conventional teaching methods (Kyado; Achor & Fahewe, 2020). Group-based teaching strategy in Social Studies can offer numerous benefits to learners. Group-based teaching strategies encourage active participation and engagement among learners. Working in groups promotes collaboration, discussion, and interaction among students. It provides an opportunity for students to share ideas, ask questions, and actively contribute to the learning process. This active engagement enhances understanding, critical thinking, and problem-solving skills. Social Studies often require students to work in teams and collaborate with others in the workplace. Group-based teaching strategies foster the development of teamwork and communication skills, which are essential for Social Studies learning.

Research in Group-Based Learning (GBL), (Guskey, & Gates, 2016) indicate that group learning approach does enhance students' academic achievement in social sciences (Achor and Gbadamosi, 2020). Consequently, if systematically practiced, GBL model could be of immense help to teachers and administrators in arresting the decline in learners' achievement in Social Studies. There are two approaches employed under GBL. These are Group-Based Learning (GBL) and Personalized System Instruction (PSI). In GBL approach the subject matter is verbally presented while in PSI approach it is presented in a written form, (Bloom, 2017). In both approaches the contents, is divided into small units with specific objectives and arranged in hierarchical order of complexity (Keller, 2017). In finding out the effects of GBL on students' motivation and achievement in this study, GBL was used and the learners who attained the required mastery level were allowed to proceed to the subsequent unit of the topic selected while those who fail to reach the required level of proficiency were given extra tuition. The required level of knowledge proficiency and competence was assessed through formative tests, feedback, remediation, and finally summative tests (Bloom, 2017, Kulik, & Bangert-Drowns, 2020).

The GBL approach relies on setting standards of group and excellence, followed by a strategy to bring as many students as possible to this standard. In this way students are informed of the performance required but are not in competition for grades. They are to be judged based on levels of group obtained by students in the previous year. This enables a more cooperative approach; students helping each other without the fear that special advantage is being given to those who are being assisted (Kulik & Bangert Drowns, 2020).

The principles of Group-Based Learning include matching teaching to student outcomes, utilizing multiple instructional methods, giving specific feedback, and fostering correctives and extensions. Effective teachers intentionally engage their students in the multiple

cognitive levels of thinking described in Bloom's Cognitive Taxonomy: knowledge, comprehension, application, analysis, synthesis, evaluation, creative and complex thinking (Kulik, J.A. & Bangert-Drowns, 2020). In conclusion, the integration of technology and group-based learning strategies is a promising approach to enhancing students' learning outcomes in Social Studies. However, for this potential to be fully realized in Osun State and Nigeria as a whole, there is a need for targeted interventions that address infrastructural gaps, provide teacher training, and ensure equitable access to educational technologies.

Despite the growing recognition of the importance of integrating technology in education, many schools in Osun State, Nigeria, still rely heavily on traditional instructional methods that often fail to engage students effectively or enhance learning outcomes. Social Studies, a subject critical for fostering civic awareness and social responsibility, requires innovative instructional approaches to ensure that students not only understand the content but can also apply it to real-world situations. While the use of technology and team-based learning strategies has shown promise in improving students' academic performance in various contexts, their application in Social Studies education in Osun State remains underexplored. This study seeks to address this gap by investigating the impact of technology integration and team-based learning on students' learning outcomes in Social Studies. The problem lies in understanding whether these strategies significantly improve students' performance and how they can be optimally applied within the local educational context.

Objectives of the Study

The main objective of this study is to examine the impact of technology integration and team-based learning strategies on students' performance in Social Studies in Osun State, Nigeria.

The specific objectives are to:

1. investigate students' learning outcomes in Social Studies before being exposed to technology integration and group-based learning strategies.
2. assess students' learning outcomes in Social Studies after being exposed to technology integration and group-based learning strategies.
3. compare the pre-test and post-test mean scores of students to determine the effectiveness of the interventions.
4. determine the extent to which the combination of technology integration and group-based learning strategies can improve students' academic performance in Social Studies.

Research Hypotheses

The following null hypotheses were formulated for the study:

1. There is no significant difference in the pre-test mean score of students taught Social Studies before being exposed to technology integration and group-based learning strategies.
2. There is no significant difference in the post-test mean score of students taught Social Studies when exposed to technology integration and group-based learning strategies.

Research Question

1. To what extent will the use of technology integration and group-based learning strategies improve students' performance in Social Studies?

Methodology

This study employed a quasi-experimental design with a pre-test and post-test control group structure to evaluate the impact of technology integration and group-based learning strategies on student academic achievement in Social Studies. The study was conducted with a population of 115,775 junior secondary school students in Osun State, with a sample size of 187 students selected from Junior Secondary School II (JSS II). A multistage sampling procedure was employed, where two schools were chosen, and two intact classes from each school were selected for the study. One group served as the experimental group, while the other served as the control group. Two research instruments were designed for the study titled Achievement Test in Social Studies (ATSS), a test with 30 multiple-choice questions, was divided into three sections—ten gap-filling questions, ten objective questions, and ten true/false items. The ATSS was used for both the pre-test and post-test to measure student learning outcomes. A Technology Integration Instructional Guide, which outlined the use of various technologies such as downloadable software (offline/online), computers, mobile phones, projectors, public address systems, interactive/calibrative whiteboards, and other digital tools for teaching Social Studies. The ATSS was given to experts in Social Studies education, Tests and Measurement as well as English Language, all at University of Ilesa, to ensure face, content, and construct validity of the instrument. It is upon their constructive criticism, suggestions and recommendation that the corrected version of the instrument was finally adopted for the study. For reliability of the instrument, test-retest method was employed, with the test being administered to 20 JSS II students in an LGA not included in the main study. The results of the two tests were correlated using Pearson's Product Moment Correlation, yielding a reliability coefficient of 0.71, which indicated acceptable internal consistency.

The experimental process was carried out in three stages, firstly the Pre-treatment Stage: During this stage, the cooperation of school administrators and Social Studies teachers was sought. The researcher met with the administrators and teachers of the selected schools to explain the objectives of the study. Teachers who would participate in the study were trained on their roles, particularly those involved in the experimental group. The experimental group was taught using the Technology Integration Instructional Guide. This group was exposed to a variety of technologies such as computers, mobile devices, projectors, and interactive/calibrative whiteboards to enhance teaching and learning in Social Studies. The use of these technologies was supplemented with a team-based learning strategy, where students worked in collaborative groups to solve problems and engage with the content. The control group was taught the same Social Studies concepts using a traditional instructional method (chalk-and-talk) while being grouped into teams as well. However, no technology was used in their instruction. Post-treatment Stage: After the interventions, both the experimental and control groups took the post-test (the same ATSS used in the pre-test) to evaluate the impact of the instructional methods on their learning outcomes. The performance of the students in both groups was compared to determine the effect of the technology integration and team-based learning strategy. Data obtained from the students'

responses to the pre-test and post-test were analyzed using both descriptive and inferential statistics. Descriptive statistics (mean and standard deviation) were used to summarize the performance of students in the two groups. Inferential statistics were employed using Analysis of Covariance (ANCOVA) to test the formulated hypotheses. The hypotheses were tested at a 0.05 significance level to determine whether there were significant differences between the pre-test and post-test scores of students in the experimental and control group.

Result

The findings of the research for the study are shown below.

Research Question:

1. To what extent will the use of technology integration and team based learning strategy improve students' performance in Social Studies?
- 2.

Table 1: Effects of technology integration and team based learning strategies on students' performance in social studies

<i>Method</i>	<i>Pre-Test</i>			<i>Post-Test</i>		<i>Mean Diff</i>
	<i>Number</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	
<i>Team-Based Group</i>	88	12.91	3.897	15.51	5.002	0.80
<i>Technology Integration</i>	86	14.95	3.905	17.25	4.995	0.60
<i>Total</i>	174	14.42	4.887	16.45	6.005	0.53

Prior to treatment, Table 1 showed that the typical student received scores of 14.42 and 12.91 when exposed to team based and technology integration strategies, respectively. With a 14.42 cumulative average, the categories appear to be uniform. The average score for students who received their education via technology integration was 17.24 (mean = 17.04), while the average score for students who received their education in the team based manner was 15.51. The total cost of the therapy was 16.45. In comparison to the team based method, this suggests that the best method for improving students' performance in social studies is technology integration.

Hypothesis 1: There is no significant difference in the performance of students taught Social Studies before being exposed to technology integration and team based strategies.

Table 2: ANCOVA Analysis of Social Studies performance in the Team based group and Students Exposed to Technology Integration

Tests of Between-Subjects Effects

Dependent Variable: POSTTEST

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	198.682 ^a	3	66.227	7.980	.000	.319
Intercept	587.457	1	587.457	70.787	.000	.581
PRETEST	166.310	1	15.204	1.832	.063	.035
group	299.280	2	27.001	6.002	.000	.283
Error	123.246	173	8.299			
Total	1374.96	176				
Corrected Total	1223.927	175				

a. R Squared = .319 (Adjusted R Squared = .279)

The results of Table 2 revealed that ($F_{2, 296}=1.101, p>0.05$). The claim is not disproved. This demonstrates that the academic achievement of the team based group and the children who attended social studies classes prior to being exposed to technology integration did not differ noticeably. This shows that the two groups were equal before the trial began.

Table 2 displays the results as ($F_{2, 296}=6.002, p<0.05$). The hypothesis is not rejected. This shows that students who were taught social studies and exposed to technology integration have post-test mean scores that are significantly different from those of the group based group.

Discussions

According to the study's findings, technology integration strategy looks to be a more successful teaching tool than the team-based learning strategy for raising students' performance in Social Studies. This result is consistent with Heeger's (2010) findings, which reveal that secondary school students who often engage in online or e-learning performed significantly better than secondary school students who used traditional techniques. Similar to this, Fayomi, Ayo, Ajayi, and Okorie (2015) discovered in their research that the self-development effect of e-learning is a major predictor of academic achievement in secondary school pupils.

Conclusion

The two groups (technology integration and team-based) were homogenous at the start of the trial, according to the study's findings. Students at junior secondary schools performed better in social studies through the adoption of technology integration techniques than students in the team based group. Additionally, it is determined that junior secondary school students' attitudes about social studies were better in the technology integration group than in the team based group. Despite how successful the method (technology integration) is, it does not discriminate against women.

Recommendations

According to the study's findings, the following recommendations were put forth: To encourage teachers and students to frequently use these technology integration resources. The government and school administration should provide enough funds for technology integration facilities in classrooms.

The state, municipal, and federal educational administrators and inspectors should make an effort to rigorously monitor instructors' activities while instructing using the advised technology integration teaching styles, which are activity-based and child-centered.

The government and all other interested parties should regularly host seminars, workshops and symposiums. This will assist in updating and refreshing teachers' understanding of cutting-edge, beneficial teaching strategies like technology integration technique. These conferences serve as in-service training for instructors on the most recent social studies teaching techniques.

Parents should also make all of the technology and online learning materials available to their kids in order to support their learning.

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