



JOURNAL OF SCIENCE, TECHNOLOGY AND EDUCATION (JSTE)



**A PUBLICATION OF THE
DEPARTMENT OF SCIENCE,
TECHNOLOGY AND MATHEMATICS
EDUCATION (STME),
NASARAWA STATE UNIVERSITY, KEFFI, NIGERIA**



VOLUME 10

ISSN: 2651-5539

EFFECT OF GOOGLE CLASSROOM ON STUDENTS' INTEREST AND ACHIEVEMENT IN GEOMETRY AMONG SENIOR SECONDARY SCHOOL STUDENTS IN KUJE AREA COUNCIL, ABUJA, NIGERIA

¹Onyeike, C. E., ²Musa. D. C. and ³Azige, G. D.

^{1,2,3}Department of Science, Technology and Mathematics Education, Faculty of Education
Nasarawa State University, Keffi, Nigeria.

Corresponding author: Onyeikechino@gmail.com

Citation: Onyeike, C. E., Musa, D. C. & Azige, G. D. (2026). Effect of google classroom on students' interest and achievement in geometry among senior secondary school students in Kuje Area Council, Abuja, Nigeria. *Journal of Science, Technology, and Education (JSTE)*; www.nsukjste.com/. 10(20), 259-269.

Abstract

This study investigated the effect of Google Classroom on students' interest and academic achievement in geometry among senior secondary school students in Kuje Area Council, Abuja. A quasi-experimental design with a pre-test and post-test, non-equivalent control group, was adopted. The study was guided by four research questions and four corresponding null hypotheses. The population comprised 2,694 SS2 students, from which a sample of 78 students was selected using purposive sampling from two intact classes. Data were collected using the Geometry Achievement Test (GAT) and Geometry Interest Scale (GIS). The instruments were validated by experts, and

reliability indices of 0.81 and 0.79 were obtained using Kuder-Richardson 21 and Cronbach's Alpha, respectively. Mean and standard deviation were used to answer the research questions, while Analysis of Covariance (ANCOVA) was employed to test the hypotheses at 0.05 level of significance. The findings revealed that using Google Classroom significantly increased students' interest and achievement in geometry compared to the conventional teaching method. It was recommended that mathematics teachers integrate Google Classroom into instructional practices and that educational stakeholders provide necessary training and technological support.

Keywords: Effect, Google Classroom, Geometry, Students' Interest, Achievement

Introduction

Mathematics plays a vital role in scientific and technological advancement, serving as a foundation for problem-solving and logical reasoning. Among its core components, geometry is essential for

developing spatial understanding and analytical skills. Despite its importance, students' performance in geometry has remained consistently poor, particularly in external examinations such as those conducted by WAEC. This poor

performance is often linked to students' lack of interest, fear of the subject, and reliance on traditional, largely teacher-centered teaching methods. In Kuje Area Council, Abuja, similar trends have been observed, where students exhibit low engagement and poor achievement in geometry. Conventional instructional approaches may not adequately stimulate students' interest or support meaningful learning. With the rapid advancement of technology, digital learning platforms such as Google Classroom have emerged as innovative tools that enhance teaching and learning.

Google Classroom facilitates interactive learning, easy access to instructional materials, and improved communication between teachers and students. It also supports multimedia instruction, which aligns with modern educational theories that emphasize learner-centered approaches. However, despite the potential benefits of Google Classroom, its integration into secondary school mathematics instruction remains limited, particularly in the Kuje Area Council. This study therefore sought to determine whether using Google Classroom can significantly improve students' interest and academic achievement in geometry compared with the conventional teaching method.

Geometry is a branch of mathematics that studies shapes, sizes, angles, dimensions, and the relationships among objects, forming the focus of this study. It is a core component of mathematics education and is essential for understanding real-life applications.

Interest is the level of curiosity and positive disposition students display toward learning geometry. Students who show interest in a subject are more likely to participate actively and achieve better results.

Achievement is the students' performance as measured by their scores in geometry achievement tests administered after exposure to the specified teaching strategies. Google Classroom is a Digital Tool that enables students to attend classes online. It supports collaboration, flexibility, and student-centered learning.

The study is anchored on Expectancy Value Theory (EVT) by Jacquelynne Eccles and Allan Wigfield, which posits that students perform better when they believe they can succeed and when they are interested in the task, and on the Cognitive Theory of Multimedia Learning, which posits that students learn better when instruction combines words and visuals. Google Classroom supports this by integrating multimedia resources into teaching.

Statement of the Problem

Teachers, students, and other education stakeholders are always concerned about students' declining performance in Mathematics in the West African Senior School Certificate Examinations. Student achievement and interest in Mathematics, particularly geometry, in Nigerian schools are generally low. According to the stakeholders' reports, most candidates avoid questions on polygons. When they attempted geometry questions, only a few candidates demonstrated a clear understanding of the problem in their work. Most students in the study area fear and lack interest in geometry, leading to difficulties answering Mathematics questions during examinations. The reasons for this could include a lack of management of large classrooms, ineffective teaching methods, inadequate instructional materials, limited access to qualified Mathematics teachers, a lack of learners' interest, poor teacher-learner relationships, and socioeconomic background. To address this, an effective teaching method that enhances students' interest and achievement in geometry is essential. This research therefore sought to investigate the effect of Google Classroom on students' interest and achievement in geometry among senior secondary school students in Kuje Area Council, Abuja.

Objectives of the Study

The main objective of this study was to investigate the effect of Google Classroom on students' interest and achievement in geometry.

The specific objectives are as follows:

- i. To determine the effect of Google Classroom on students' interest in geometry among senior secondary school students in Kuje Area Council, Abuja.
- ii. To determine the influence of gender on students' interest in geometry when taught using Google Classroom.
- iii. To determine the effect of Google Classroom on students' achievement in geometry among senior secondary school students in Kuje Area Council, Abuja.
- iv. To determine the influence of gender on students' achievement in geometry when taught using Google Classroom.

Research Questions

To achieve the research objectives of the study, the following research questions were raised to guide the study:

1. What are the mean interest ratings of students taught geometry using Google Classroom and those taught using conventional method?
2. What are the mean interest ratings of male and female students taught geometry using Google Classroom?

3. What are the mean achievement scores of students taught geometry using Google Classroom and those taught using conventional method?
4. What are the mean achievement scores of male and female students taught geometry using Google Classroom?

Statements of Hypotheses

Based on the objectives of the study, the following null hypotheses were formulated and tested at 0.05 level of significance.

- H01:** There is no significant difference in the mean interest ratings of students taught geometry using Google Classroom and those taught using conventional method
- H02:** There is no significant difference in the mean interest ratings of male and female students taught geometry using Google Classroom.
- H03:** There is no significant difference in the mean achievement scores of students taught geometry using Google Classroom and those taught using conventional method.
- H04:** There is no significant difference in the mean achievement scores of male and female students taught geometry using Google Classroom.

Methodology

The study adopted a quasi-experimental design involving pre-test and post-test non-

equivalent control groups. The population consisted of 2,694 SS2 students in Kuje Area Council, Abuja.

A sample of 78 students was purposively selected from two intact classes. One class served as the experimental group and was taught using Google Classroom, while the other served as the control group and was taught using the conventional method.

Two instruments were used for data collection, namely, Geometry Achievement Test (GAT) and

Geometry Interest Scale (GIS). The instruments were validated by three experts in mathematics education, measurement, and evaluation. Reliability was established using Kuder-Richardson 21 for GAT (0.81) and Cronbach's Alpha for GIS (0.79).

The experimental group was taught using Google Classroom, where instructional materials such as notes, videos, and assignments were uploaded and accessed online. Students interacted with the teacher through comments and participated in online activities. Assignments were submitted electronically, and feedback was provided promptly. The control group was taught using the conventional method involving chalkboard instruction and textbooks.

Mean and standard deviation were used to answer research questions, while ANCOVA was used to test hypotheses at 0.05 level of significance.

Results

Research Question 1: What are the mean interest ratings of students taught geometry using Google Classroom and those taught using conventional method?

Table 1: Mean Interest Ratings and Standard Deviation of Students Taught Geometry Using Google Classroom and those Taught Using Conventional Method

Teaching Strategy	Type of test	No of students	Mean score	Std Dev.
GCR	Pre-test	37	28.86	6.659
	Post-test	37	59.73	7.305
Control	Pre-test	41	24.20	3.894
	Post-test	41	39.37	7.395

Table 1 shows that the pre-interest and post-interest mean ratings and standard deviation of students exposed to geometry using google-classroom are ($\bar{x}$ = 28.86, σ = 6.659) and ($\bar{x}$ = 59.73, σ = 7.305) respectively, and

the corresponding pre-interest and post-interest ratings and standard deviation of students in the conventional class are ($\bar{x}$ = 24.20, σ = 3.894) and ($\bar{x}$ = 39.37, σ = 7.395) respectively.

Research Question 2: What are the mean interest ratings of male and female students taught geometry using Google Classroom?

Table 2: Mean Interest Ratings and Standard Deviation of Male and Female Students Taught Geometry Using Google Classroom

Gender	Type of test	No of students	Mean score	Std Dev.
Male	Pre-test	21	28.10	6.016
	Post-test	21	62.76	6.308
Female	Pre-test	16	29.87	7.500
	Post-test	16	55.75	6.728

Table 2 shows that the pre-interest and post-interest mean ratings and standard deviation of male students exposed to geometry using Google Classroom are ($\bar{x}$ = 28.10, σ = 6.016) and ($\bar{x}$ = 62.76, σ = 6.308) respectively, and

the corresponding pre-interest and post-interest ratings and standard deviation of female students exposed to geometry using google-classroom are ($\bar{x}$ = 29.87, σ = 7.500) and ($\bar{x}$ = 55.75, σ = 6.728) respectively.

Research Question 3: What are the mean achievement scores of students taught geometry using Google Classroom and those taught using conventional method?

Table 3: Mean Achievement Scores and Standard Deviation of Students Taught Geometry Using Google Classroom and those Taught Using Conventional Method

Teaching Strategy	Type of test	No of students	Mean score	Std Dev.
GCR	Pre-test	37	11.92	3.451
	Post-test	37	23.32	2.461
Control	Pre-test	41	11.73	2.589
	Post-test	41	16.73	2.110

Table 3 shows that the pre-test and post-test mean achievement scores and standard deviation of students exposed to geometry using goggle Classroom are ($\bar{x}$ = 11.92, σ = 3.451) and ($\bar{x}$ = 23.32, σ = 2.461) respectively, and the corresponding pre-test and post-test mean achievement scores and standard deviation of students in the conventional class are ($\bar{x}$ =11.73, σ = 2.588) and ($\bar{x}$ = 16.73, σ = 2.110) respectively.

Research Question 4: What are the mean achievement scores of male and female students taught geometry using Google Classroom?

Table 4: Mean Achievement Scores and Standard Deviation of Male and Female Students Taught Geometry Using Google Classroom and those Taught Using Conventional Method

Gender	Type of test	No of students	Mean score	Std Dev.
Male	Pre-test	21	12.43	4.020
	Post-test	21	23.48	2.542
Female	Pre-test	16	11.25	2.490
	Post-test	16	23.13	2.419

Table 4 shows that the pre-test and post-test mean achievement scores and standard deviation of male students exposed to geometry using Google Classroom are ($\bar{x}$ = 12.43, σ = 4.020) and ($\bar{x}$ = 23.48, σ = 2.542) respectively, and the corresponding pre-test and post-test mean achievement scores and standard deviation of female students exposed to geometry using Google Classroom are ($\bar{x}$ = 11.25, σ = 2.490) and ($\bar{x}$ = 23.13, σ = 2.419) respectively.

H₀₁: There is no significant difference in the mean interest ratings of students taught geometry using Google Classroom and those taught using conventional method.

Table 5: Results of Analysis of Covariance on Students' Interest Ratings of Students Taught Geometry Using Google Classroom and those Taught Using Conventional Method

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	8115.867 ^a	2	4057.934	74.997	0.000	0.667
Intercept	8635.148	1	8635.148	159.592	0.000	0.680
PreInterest	50.728	1	50.728	0.938	0.336	0.012
Group	7241.912	1	7241.912	133.842	0.000	0.641
Error	4058.081	75	54.108			
Total	199648.000	78				
Corrected Total	12173.949	77				

a. R Squared = .667 (Adjusted R Squared = .658)

Table 5 reveals that an F-ratio of 133.842 with an associated exact probability value of 0.000, which is less than σ (alpha) value of 0.05 ($F = 133.842$, $P = 0.000 < \sigma = 0.05$). This indicates a significant difference in the mean interest ratings between students taught geometry using Google Classroom and those taught using the

conventional method, in favor of the former. Since a significant difference was observed, the null hypothesis is rejected. This implies that the Google Classroom learning strategy has a significant effect on students' post-interest ratings.

H₀₂: There is no significant difference in the mean interest ratings of male and female students taught geometry using Google Classroom.

Table 6: Results of Analysis of Covariance on Students' Interest Ratings of Male and Female Students Taught Geometry Using Google Classroom and those Taught Using Conventional Method

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	469.523 ^a	2	234.761	5.498	0.009	0.244
Intercept	6992.279	1	6992.279	163.756	0.000	0.828
PreInterest	23.035	1	23.035	0.539	0.468	0.016
Gender	411.877	1	411.877	9.646	0.004	0.221
Error	1451.774	34	42.699			
Total	133924.000	37				
Corrected Total	1921.297	36				

a. R Squared = .244 (Adjusted R Squared = .200)

Table 6 reveals that an F-ratio of 9.646 with an associated exact probability value of 0.004, which is less than σ (alpha) value of 0.05 ($F = 9.646$, $P = 0.004 < \sigma = 0.05$). This indicates a significant difference in the mean interest ratings of male and female students taught

geometry using Google Classroom, in favour of the male students. Since a significant difference was observed, the null hypothesis was rejected. This implies that Google Classroom's learning strategy has a significant effect on post-interest ratings by gender.

H03: There is no significant difference in the mean achievement scores of students taught geometry using Google Classroom and those taught using conventional method.

Table 7: Results of Analysis of Covariance on Students Achievement Scores Taught Geometry Using Google Classroom and those Taught Using Conventional Method

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	845.708 ^a	2	422.854	80.138	0.000	0.681
Intercept	1824.651	1	1824.651	345.804	0.000	0.822
Pretest	.416	1	0.416	0.079	0.780	0.001
Group	843.295	1	843.295	159.819	0.000	0.681
Error	395.741	75	5.277			
Total	32003.000	78				
Corrected Total	1241.449	77				

a. R Squared = .681 (Adjusted R Squared = 0.673)

Table 7 reveals that an F-ratio of 159.819 with an associated exact probability value of 0.000, which is less than σ (alpha) value of 0.05 ($F = 159.819, P = 0.000 < \sigma = 0.05$). This indicates that there is a significant difference in the mean achievement scores of students taught geometry using Google Classroom and those

taught using conventional method in favour of the students taught using Google Classroom. Since a significant difference was observed, the null hypothesis was rejected. This implies that the Google Classroom learning strategy has a significant effect on students' post-achievement scores.

H₀₄: There is no significant difference in the mean achievement scores of male and female students taught geometry using Google Classroom.

Table 8: Results of Analysis of Covariance on Students' Achievement Scores of Students Taught Geometry Using Google Classroom and those Taught Using Conventional Method

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	8.446 ^a	2	4.223	0.685	.511	0.039
Intercept	1295.928	1	1295.928	210.155	0.000	0.861
Pretest	7.326	1	7.326	1.188	0.283	0.034
Gender	0.335	1	0.335	0.054	.817	0.002
Error	209.662	34	6.167			
Total	20347.000	37				
Corrected Total	218.108	36				

a. R Squared = .039 (Adjusted R Squared = -.018)

Table 8 reveals that an F-ratio of 0.054 with an associated exact probability value of 0.817, which is greater than σ (alpha) value of 0.05 ($F = 0.054, P = 0.817 > \sigma = 0.05$). This indicates that there is no significant difference in the mean achievement scores of male and female

students taught geometry using Google Classroom. Since no significant difference was observed, the null hypothesis was not rejected. This implies that the Google Classroom learning strategy did not produce a significant effect on the post-achievement scores by gender.

enhanced students' interest and achievement in geometry. Students exposed to the strategy demonstrated higher engagement and more positive

Discussion

The findings revealed that the use of Google Classroom learning strategy

attitudes toward learning than those taught using conventional methods. This increased interest is attributed to Google Classroom's interactive and stimulating features, which promote active participation and deeper understanding.

Findings also indicated that both male and female students benefited from the strategy, although male students showed slightly higher interest levels. However, the overall results suggest that the approach is largely gender-inclusive, as differences in achievement between male and female students were not statistically significant.

Furthermore, students taught using Google Classroom performed better academically than their counterparts in the control group, confirming the strategy's effectiveness in improving understanding and retention of geometric concepts. These outcomes align with previous studies that emphasize the role of digital learning tools in enhancing student performance, engagement, and feedback.

The findings are supported by the Cognitive Theory of Multimedia Learning, which posits that students learn better when information is presented through multiple formats, such as text and visuals. The user-friendly nature and accessibility of Google Classroom likely contributed to its acceptance and effectiveness among students. Overall, the study concludes that Google Classroom is an effective

instructional strategy for improving students' interest and achievement in geometry, while also helping to reduce anxiety and promote active learning.

Conclusion

The study concludes that Google Classroom is an effective instructional tool for improving students' interest and achievement in geometry compared to the conventional method. Google Classroom learning strategy is equally effective for male and female students.

Recommendations

1. Mathematics teachers should integrate Google Classroom into instructional practices.
2. Schools should provide adequate ICT facilities to support digital learning.
2. Government and educational authorities should organize regular training for teachers on the use of digital tools.

References

- Abraham, A. I., Victor, O. O., & Endurance, I. (2023). Effect of Google Classroom as a tool in chemistry teaching and learning in senior secondary schools in Ankpa L.G.A., Kogi State, Nigeria. *International Journal of Research in Education and Sustainable Development*, 3(3), 133–142.
- Abidin, A. Z. Z., & Saputro, T. M. E. (2020). Google classroom as a

- mathematics learning space: Potentials and challenges. *Journal of Physics: Conference Series*, 1567, 022094. <https://doi.org/10.1088/1742-6596/1567/022094>
- Albashtawi, A. H., & Al Bataineh, K. A. (2020). The effectiveness of Google Classroom among EFL students in Jordan: An innovative teaching and learning online platform. *J-SHMIC: Journal of English for Academic*, 8(1), 12–23. [https://doi.org/10.25299/jshmic.2021.vol8\(1\).6216](https://doi.org/10.25299/jshmic.2021.vol8(1).6216)
- Al-Samarraie, H., & Hurmuzan, S. (2018). A review of Google Classroom techniques in higher education. *Thinking skills and creativity*, 27, 78–91. <https://doi.org/10.1016/j.tsc.2018.12.002>
- Anekwe, J. U., & Amadi, U. (2020). Effect of Google Classroom on interest and performance of trainee teachers in computer education. *EPRA International Journal of Research and Development*, 5(4), 256–266.
- Cacace, M. (2019). Effects of Google Classroom on the achievement of students with learning disabilities in the mathematics classroom (Publication No. 2679) [Master's thesis, Rowan University]. Rowan Digital Works. <https://rdw.rowan.edu/etd/2679>
- Eze, P. C. (2020). Sociocultural factors influencing gender participation in mathematics education in sub-Saharan Africa. *International Journal of Gender Studies in Education*, 5(3), 112–125.
- Federal Republic of Nigeria. (2014). National policy on education. NERDC Press.
- Mayer, R. E., & Moreno, R. (1999). Nine ways to reduce cognitive load in multimedia learning. *Educational Psychologist*, 38(1), 43–52. https://doi.org/10.1207/S15326985EP3801_6
- Nkwocha, C. (2016). Mathematics and national development in Nigeria. *Journal of Science Education*, 12(2), 14–22.
- Oyelade, B. M., & Sunday, A. K. (2021). Impact of Google Classroom on students' motivation and participation in secondary school mathematics in Oyo State, Nigeria. *Journal of Educational Technology and Innovation*, 8(3), 64–79.
- Timaji, U., Ibrahim, M., & Sirajo, A. (2017). Improving students' performance in mathematics through effective teaching methods in secondary schools. *Sokoto Journal of Education*, 17(1), 22–30.
- WAEC. (2025). Chief Examiners' report. West African Examinations Council.