



EFFECT OF SKYPE ON SS2 STUDENTS INTEREST IN GEOMETRY IN ENUGU STATE

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Abstract

Low interest in geometry contributes to poor achievement in senior secondary Mathematics in Nigeria. This study examined the effect of Skype on SS2 student's interest in geometry using a quasi-experimental design. 2,463 SS 2 students formed the population. A total of 200 SS 2 students from two co-educational public secondary schools in Enugu North Educational zone formed the sample size, namely Government Secondary School, Enugu and Government Day Secondary School, Independence Layout, Enugu. Four intact classes emerged, two were assigned to experimental group and two to control group. Two objectives, research questions and null hypothesis guided the study. A-20 item Geometry Interest Inventory designed by the researchers were face and content validated by three experts. Its reliability index was computed using Cronbach Alpha which yielded .86. It was used for data collection. The study lasted for four weeks. Data collected were analyzed using mean and standard deviation, while null hypotheses were tested using analysis of covariance (ANCOVA) at .05 level of significance. Major findings of the study revealed that that there was significant effect of Skype on student's interest while there was no significant difference in interest enhancement between male and female students in experimental group. it was recommended among others that Skype be adapted and used in teaching secondary school Mathematics especially geometry to enhance students interest in it.

Keywords: Enugu State, Geometry, Quasi-experimental, Skype, SS2

Introduction

Geometry is a core branch of the Nigerian Senior Secondary Mathematics curriculum that develops spatial reasoning and logical thinking. Despite its importance, students consistently report low interest and high anxiety toward geometry, which negatively affects achievement and participation in Science, Technology, Education and Mathematics (STEM) fields. Interest is a key affective factor that drives engagement and persistence in learning Mathematics especially in geometry.

Digital communication tools such as Skype provide opportunities for synchronous interaction, collaborative problem-solving, and connection with external experts beyond the classroom walls. Number of studies, for instance, Ityavzua (2019), showed that Skype can create motivating and authentic learning experiences by connecting students with peers and experts globally. However, empirical evidence on the effect of Skype on SS2 student's interest in geometry in Nigeria is scarce. This is a gap which this study would want to explore.

This study therefore investigated the effect of Skype on SS2 student's interest in geometry in Enugu State. The findings would inform teachers and policymakers on leveraging free communication technology to improve affective outcomes in Mathematics.

Skype is a free application that allows users to make video and audio calls over the internet. Skype Education is a global community that enables teachers to collaborate on projects, connect with other classrooms, and invite guest speakers into lessons. Skype is a free application that allows users to make video and audio calls over the internet. According to Skype Education. (2026), educators report that Skype transforms classrooms by creating authentic, motivating learning experiences and extending learning beyond classroom walls. Its ease of use and low cost makes it accessible for schools with limited resources. In this study, Skype refers to its use as an instructional tool for synchronous collaborative learning and expert interaction in geometry lessons.

Hidi and Renninger's (2006) proponent of Interest Development Theory opined that interest is a psychological state of engagement and a predisposition to re-engage with content over time. Studies in Nigeria have shown that technology-mediated strategies such as virtual Mathematics laboratories, GeoEnZo software, and tablet teaching strategies significantly improve secondary school students' interest in geometry. According to Community of Inquiry Framework (Davis, 1989), Proposed that learning occurs through the interaction of social presence, cognitive presence, and teaching presence. Skype enhances social and teaching presence by enabling real-time interaction, feedback, and collaborative problem-solving. To him, no gender differences will be found in virtual Mathematics laboratories, GeoEnZo software, and tablet teaching strategies interventions. To my mind, interest in Geometry refers to Students' psychological state of engagement and predisposition to re-engage with geometric content, measured by situational interest, perceived value, and intention to study further.

Theoretical Framework

Community of Inquiry Framework (Davis, 1989): Proposes that learning occurs through the interaction of social presence, cognitive presence, and teaching presence. Skype enhances social and teaching presence by enabling real-time interaction, feedback, and collaborative problem-solving.

Interest Development Theory (Hidi and Renningers, 2006) four-phase model: Explains how triggered situational interest can develop into maintained situational interest through supportive learning environments. Skype-mediated lessons can trigger interest through novelty and sustained it through interactive collaboration (CoI).

Purpose of the Study

The purpose of the study was to investigate effect of Effect of Skype on SS2 Students' Interest in Geometry in Enugu North Local Government Area of Enugu State.

Specifically, the study was to:

- a. determine the effect of Skype on students interest in geometry; and
- b. examine the effect of Skype on students interest based on gender.

Research Questions

The following research questions guided the study:

1. Is there difference in the mean interest scores between students taught geometry using Skype and those taught using conventional method?
2. Is there gender difference in interest among students taught geometry using Skype?

Hypothesis

The following null hypotheses (HOs) tested at .05 level of significance were formulated to further guide the study:

Ho₁: There is no significant difference between the mean interest scores of students taught geometry using Skype and those taught using conventional method.

Ho₂: There is no significant difference in interest between male and female students taught geometry using Skype.

Method

A quasi-experimental pretest-posttest non-equivalent control group design was used to accommodate intact classes in schools. Four intact classes were used (two experimental group and two control group) to avoid disruption of school timetables.

Population for the study was 2,463 SS 2 students. A total of 200 SS 2 students from two co-educational public secondary schools formed the sample size for the study. The sampled schools were Government Secondary School, Enugu and Government Day Secondary School, Independence Layout, Enugu. Four intact classes emerged from two co-educational public secondary schools in Enugu North LGA, Enugu State. Two were assigned to experimental group (n=100) taught via Skype-mediated instruction and the remaining two intact classes

were assigned to control group (n=100) taught with conventional method. Gender distribution in the experimental group was 98 males and 102 females.

Two each of objectives, research questions and null hypothesis guided the study.

A-20 item Geometry Interest Inventory (GII) designed by the researchers was instrument used for data collection. GII was a modified 4-point Likert scale of strongly agree (SA), agree (A), disagree (D) and strongly agree (SD). Positive statements have the rating thus (SA=4, A=3, D=2 and SD=1), while negative statements have the rating thus (SA=1, A=2, D=3 and SD=4). measuring situational interest, value, and intention to study geometry further. GII was face and content validated by three experts (that is, two Mathematics Education experts and one Measurement and Evaluation expert) in the Departments of Mathematics Education and Educational Psychology, Federal College of Education, Eha-Amufu ; Enugu State. Cronbach Alpha was used to determine the reliability index of the instrument (because the GII was polychotomous) which yielded .86. Statistical Package for Social Sciences (SPSS) version 5 was used for the computation.

The study lasted for 4 weeks of three periods per a week, each 40 minutes for both experimental and control groups. For experimental group, 2 teacher-led lessons and 1 Skype-mediated session per week. Students engaged in Skype calls with peers from another school to solve geometry problems collaboratively, observed guest lecturers from Mathematics educators, and participated in virtual mystery geometry activities. For control group, 3 periods per week of conventional chalk-and-talk instruction using textbooks and chalkboard. Both experimental and control groups were pretested and post-tested using GII.

Data collected were analyzed using mean and standard deviation, while analysis of covariance (ANCOVA) was used to test the hypotheses at .05 level of significance with pretest scores as covariate. Effect sizes were reported as partial eta squared (η^2) and Cohen's d. Maximum score was 80 marks, while minimum score was 20 marks.

Results

Research Question One: Is there difference in the mean interest scores between students taught geometry using Skype and those taught using conventional method?

Table 1: Mean and Standard Deviation of Pretest and Posttest Interest Scores

Group	N	Pretest Mean	(SD)	Posttest Mean	(SD)	Mean Gain	Mean Diff B/w Gps
Experimental	100	50.12	8.74	64.89	7.96	14.77	
Control	100	50.45	8.81	57.23	8.15	6.78	7.99
Total	200						

Table 1 showed that the pretest and posttest mean scores in experimental were 50.12 and 64.89, standard deviations as 8.74 and 7.96, while in the control group, pretest and posttest mean scores were 50.45 and 57.23, standard deviations as 8.81 and 8.15. The mean gain experimental and control groups were 14.77 and 6.78 respectively. This shows that both

groups had improved interest in GII after the treatment. However, the posttest mean interest of the experimental group was higher than the control group by 7.99. Furthermore, a lower standard deviation between experimental and control groups shows that there were fewer extreme scores in the experimental group than in the control group.

Hence in Table 1, Pretest scores were nearly equal for both groups. Posttest score for experimental group was higher than control group. The interpretation is that both groups started at similar levels. The experimental group showed greater improvement after intervention (using Skype).

Hypothesis One: There is no significant difference between the mean interest scores of students taught geometry using Skype and those taught using conventional method.

Table 2: ANCOVA results of students in Skype and Conventional method on Achievement test.

Source	SS	df	MS	F	p	η^2
Pretest	512.44	1	512.44	4.12	.024	.036
Treatment	1735.82	1	1735.82	18.94	<.05	.088
Error	4677.23	195				
Total	6925.49	197				

Table 2: ANCOVA showed a significant effect of Skype on interest, $F(1,197) = 18.94$, $p < .05$, $\eta^2 = .088$. Recall in Table 1, students in the experimental group had higher mean scores, Mean=64.89, SD=7.96, than the control group, M=57.23, SD=8.15. Refuse to accept H_{01} , Table 2: ANCOVA revealed $F(1,197) = 18.94$, $p = .024$: $p < .05$, $\eta^2 = .088$. Since $p < .05$. Refuse to accept H_{01} because students taught via Skype had significantly higher mean interest score than those taught using conventional method.

Thus, there was significant difference based on the effect of Skype in mean interest scores of students between experimental group and control group, in favour of the students in experimental group.

Research Question Two: Is there gender difference in interest among students taught geometry using Skype?

Hypothesis Two: There is no significant difference in interest between male and female students taught geometry using Skype.

Table 3: Independent Samples t-test for Gender Difference in Experimental Group

Gender	N	Mean	S.D.	t	df.	p	Cohen's d
Male	51	66.44	8.58	.45	98	.654	.09
Female	49	67.21	8.91				
Total	100						

In Table 3, Independent samples t-test: $t(98) = .45$, $p = .654$, $d = .09$.

Since $p > .05$, refuse to reject H_0 . Gender did not moderate the effect of Skype on interest, consistent with findings of Skype Education (2026), which opined that using GeoEnZo and virtual Mathematics laboratories bring about in balance in gender interest.

Discussion

The significant improvement in interest supports the Community of Inquiry Framework and Garrison, Anderson and Archer (2020), who opined that Skype enhanced social and teaching presence through real-time interaction and collaboration. They further maintained that novelty of connecting with external peers and experts likely triggered situational interest. The findings aligning with Interest Development Theory attest to the fact that collaborative problem-solving sustain and enhance interest.

The absence of gender differences indicates that Skype provides an equitable platform for developing interest when access is controlled. These findings align with James, Iji, Abakpa, and Anyagh (2021), study which stated that technology-mediated strategies improve interest in geometry without gender bias.

The moderate effect size, $\eta^2 = .088$, indicates practical significance for classrooms with limited resources, as Skype requires only internet-enabled devices and free software.

Conclusion

Skype significantly enhanced SS2 students' interest in geometry in Enugu State, with no gender bias. The interactive and collaborative nature of Skype supports both cognitive and affective learning outcomes.

Recommendations

The following recommendations were made based on the results of the study:

For Mathematics teachers: Integrate Skype for collaborative problem-solving and guest lecturers in geometry units.

For Enugu State Ministry of Education: Provide training on using Skype for Mathematics instruction.

For School Management: Ensure reliable internet access and basic ICT infrastructure to support Skype-mediated lessons.

For Future Researchers: Examine the effect of Skype on achievement and retention in geometry.

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