



## **Efficacy of Google Meet Platform on Students' Interest and Performance in Computer Studies in Rivers State**

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### **ABSTRACT**

This study investigated the efficacy of Zoom and Google Meet Videoconferencing platforms on students' interest and academic performance in Computer Studies in Private Senior Secondary Schools in Rivers State. Three research questions and corresponding hypotheses guided the study. A quasi-experimental design using a non-randomized, non-equivalent, pre-test and post-test experimental group was adopted and the population comprised Senior Secondary II students (SS2) in selected 349 fully accredited private senior secondary schools in Rivers State. The sample for this study comprised 210 Senior Secondary II students (SS2) drawn from intact classes in six selected private senior secondary schools in Rivers State. This sample was drawn using a multi-stage sampling procedure. Two instruments for data collection for the study included; Computer Studies Interest Inventory (CSII) and a Performance Test on Computer Studies titled; Computer Studies Performance Test (CSPT). Experts validated the instruments and reliability coefficients of 0.85 and 0.92 were obtained respectively. The post-test scores generated from the administration of the instruments were subjected to quantitative data analysis using mean and standard deviation to answer research questions and t-test and ANCOVA to test the null hypotheses. Findings showed that the two platforms had positive effects; the Google Meet Videoconferencing Platform had a higher positive effect on the students' interest rating and academic performance when compared with Zoom. It was concluded that Zoom and Google Meet Videoconferencing Platforms enhanced students' interest and academic performance in Computer Studies. Hence, secondary schools in the study area should consider the adoption of learning management systems and videoconferencing platforms for increased acceptance of e-learning in the teaching and learning of ICT-related subjects.

**Keywords:** E-learning, videoconferencing, Zoom, Google Meet, interest, academic performance.

### **INTRODUCTION**

It is well known that over the past few years, the COVID-19 pandemic has triggered social and economic upheavals in many countries. Major changes have also been sparked by this in the often slow-changing educational sector. The idea that the educational paradigm has fundamentally changed from in-person classes to online learning is not an exaggeration. Hence, many teachers and learners have had to rapidly adapt to online learning using different technology-mediated platforms such as videoconferencing.

Videoconferencing simply is a method of communicating between two or more locations in which sound, vision and data signals are conveyed electronically to enable simultaneous interactive communication. Much more personal and effective than audio conferencing, all parties involved can see the facial expressions and body language that are so vital to the way we communicate (JNT, 2007). Videoconferencing also affords educators a means by which to transcend geographic bounds with synchronous communication that holds the potential for learners to feel the social presence that may be less available in asynchronous interactions (e.g., discussion boards).

At the peak of the pandemic, the popular videoconferencing platforms were Zoom and Google Meet which were also the choices for many government agencies, universities, non-profit organizations and individuals. Both are web-based collaborative video conferencing tools that provide quality audio, video, and screen sharing, which makes them great for virtual conferences, online lectures, online meeting, webinars, and more.

According to Lowenthal, Borup, West and Archambault (2020), these videoconferencing platforms can reduce feelings of social isolation and foster a sense of community among students. However, doubts still exist about the efficacy of Zoom and Google Meet to arouse students' interest and enhance academic performance. It has been further reported that features of Zoom and Google Meet may be difficult to access at first and may prove less intuitive in terms of their use (Dharma, Asmarani, & Dewi 2017). In addition, as with other synchronous online programs, students may become distracted or engaged in multitasking and classes and lectures may stretch out longer than anticipated (Lowenthal et al. 2020). Students using these platforms may also experience difficulties such as unreliable Internet connections, lack of a quiet environment, and inadequate speakers or microphones (Lowenthal et al. 2020). Teachers' technical disability has also created doubt on how best lesson contents can be tailored to suit these videoconferencing platforms. The aforementioned drawbacks and more have prompted the researchers to investigate the efficacy of Zoom and Google Meet Videoconferencing platforms on secondary school students' interest and academic performance in Computer Studies in selected private Senior Secondary Schools in Rivers State.

### ***Aim and Objectives of the Study***

This study aimed at investigating the efficacy of Zoom and Google Meet Videoconferencing platforms on students' interest and academic performance in Computer Studies in Private Senior Secondary Schools in Rivers State. Specifically, the study sought to;

1. ascertain the effect of Zoom Videoconferencing Platform (ZVP) on students' pretest and posttest interest mean ratings in Computer Studies in Private Senior Secondary Schools in Rivers State
2. examine the effect of Google Meet Videoconferencing Platform (GMVP) on students' pretest and posttest interest mean ratings in Computer Studies in Private Senior Secondary Schools in Rivers State
3. ascertain the effect of Zoom Videoconferencing Platform (ZVP) on students' pretest and posttest performance mean scores in Computer Studies in Private Senior Secondary Schools in Rivers State
4. determine the effect of Google Meet Videoconferencing Platform (GMVP) on students' pretest and posttest performance mean scores in Computer Studies in Private Senior Secondary Schools in Rivers State.

### ***Research Questions***

The following four research questions guided this study:

1. What is the difference between the pretest and posttest mean interest ratings of students taught Computer Studies using the Zoom Videoconferencing Platform (ZVP) and those taught using Google Meet Videoconferencing Platform (GMVP) in Private Senior Secondary Schools in Rivers State?
2. What difference exists between the pretest and posttest mean performance scores of students taught Computer Studies using the Zoom Videoconferencing Platform (ZVP) in Private Senior Secondary Schools in Rivers State?
3. What is the difference between the pretest and posttest mean performance scores of students taught Computer Studies using the Google Meet Videoconferencing Platform (GMVP) in Private Senior Secondary Schools in Rivers State?

### ***Research Hypotheses***

For this study to establish and determine the stated objectives, research hypotheses that are testable and analyzable based on data collected therefore need to be formulated. The following research hypotheses were formulated to guide the study.

1. There is no significant difference between the pretest and posttest mean interest ratings of students taught Computer Studies using the Zoom Videoconferencing Platform (ZVP) and those taught using Google Meet Videoconferencing Platform (GMVP) in Private Senior Secondary Schools in Rivers State.
2. Significant difference does not exist between the pretest and posttest mean performance scores of students taught Computer Studies using the Zoom Videoconferencing Platform (ZVP) in Private Senior Secondary Schools in Rivers State.
3. There is no significant difference between the pretest and posttest mean performance scores of students taught Computer Studies using the Google Meet Videoconferencing Platform (GMVP) in Private Senior Secondary Schools in Rivers State.

### ***Significance of the Study***

Data and information obtained in this study will provide the Ministry of Education and administrators with information to help formulate programmes involving videoconferencing and other ICT platforms for education. The study will help the policymakers to make well-informed decisions and investments in ICT regarding education in secondary schools. The study will be of significance to administrators because the research findings will help them to design and implement the policies to improve the students' interest, performance and quality of education by changing the attitude of students towards learning; facilitating students and improving the teaching procedures. Findings from this study will improve how effectively teachers use learning management systems and video conferencing tools like Zoom and Google Meet. Also, instructional design and other experts in education will benefit from this study as they will be equipped with the requisite skills to proffer solutions to learning difficulties.

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## **METHODOLOGY**

This study adopted a quasi-experimental design using a non-randomized, non-equivalent, pre-test and post-test experimental group design. This study was carried out in Rivers State. The population for this study comprised Senior Secondary II students (SS2) in selected 349 fully accredited private senior secondary schools in Rivers State. The sample for this study comprised 210 Senior Secondary II students (SS2) drawn from intact classes in six selected private senior secondary schools in Rivers State. This sample was drawn using a multi-stage sampling procedure and was made up of 73 students (33 males and 40 females) for experimental group I, 75 students (44 males and 31 females) for experimental group II and 62 students (35 males and 27 females) for the control group. Two instruments for data collection for the study included; Computer Studies Interest Inventory (CSII) and a Performance

Test on Computer Studies titled; Computer Studies Performance Test (CSPT). The instruments were used as pretests to be sure of the equivalent ability of the students and were as well used as posttests after the treatments have been administered to determine the effect of the treatment on the student's interest and academic performances. The instruments were given to two secondary schools' ICT teachers and an expert in measurement and evaluation for validation. To obtain the internal consistency of the Computer Studies Interest Inventory (CSII), the instrument was administered and scored appropriately, and the data obtained were analyzed using Cronbach's Alpha statistics. A reliability coefficient of 0.85 was obtained showing that the instrument is 85% reliable. The reliability coefficient of the CSPT was determined with Kuder Richardson Formula 21 (K-R 21) technique. This technique helped to establish the internal consistency of the CSPT items which is a cognitive instrument. The researcher administered the final CSPT to thirty (30) SSSII students in another private Senior Secondary School outside the sample of this study. These students' scores were used to compute the coefficient of internal consistency of CSPT. Reliability analysis produced a Kuder-Richardson reliability coefficient of 0.92. The researcher carried out the data collection procedure in stages for four weeks. The researcher visited the selected school for permission in using the students and some of the school facilities. Afterward, the instruments were administered as pretests to both the experiment and control groups to ascertain their equivalence in ability. In the second stage, the experimental groups were taught using Zoom and Google Meet platforms taking cognizance of the students' previous knowledge on the concepts of **COMPUTER APPLICATION SOFTWARE AND PROGRAMMING LANGUAGES**. The students were actively engaged and were encouraged to interact in groups, while the control groups were also taught using the conventional face-to-face method where there no proper teaching model and no interaction among students. One period of 40 minutes was allocated for each group four times a week. In the final stage, the CSII and CSPT were rearranged and administered to the groups as post-tests. The post-tests were scored and used to generate quantitative data which were analyzed using mean and standard deviation to answer research questions and t-test and ANCOVA to test the null hypotheses. The significance level of 0.05 was used to test the null hypotheses.

## RESULTS

The results of the analysis of the post-test scores in CSII and CSPT for the experiment and control groups were analyzed and the results are presented below.

**Research Question One:** What is the difference between the pretest and posttest mean interest ratings of students taught Computer Studies using the Zoom Videoconferencing Platform (ZVP) and those taught using Google Meet Videoconferencing Platform (GMVP)?

**Table 1: Comparison of mean interest rating of students in the ZVP and GMVP**

Group	Treatment	n	Pre-test $\bar{X}$ (SD)	Post-test $\bar{X}$ (SD)	Mean Gain
Experimental I	ZVP	73	43.78 (4.81)	61.83 (4.77)	18.05
Experimental II	GMVP	75	42.16 (3.92)	66.33 (5.60)	24.17

From the results shown in Table 1 on the mean comparison of students' interests who learned computer studies using Zoom Videoconferencing Platform (ZVP) and those learned using Google Meet Videoconferencing Platform (GMVP), it was shown that those who were taught using ZVP had a pretest mean rating of 43.78 (SD = 4.81), and a posttest mean rating of 61.83 (SD = 4.77) which resulted in a mean difference of 18.05, while those taught using GMVP had a pretest mean of 42.16 (SD = 3.92) and a post-test mean of 66.33 (SD = 5.60) with a resultant mean difference 24.17. This result suggests that using GMVP had a greater effect on the mean rating of students' interests in Computer Studies than using ZVP.

**Research Question Two:** What difference exists between the pretest and posttest mean performance scores of students taught Computer Studies using the Zoom Videoconferencing Platform (ZVP)?

**Table 2: Comparison of mean performance scores of students taught Computer Studies using the Zoom Videoconferencing Platform (ZVP)**

Group	Treatment	n	Pre-test $\bar{X}$ (SD)	Post-test $\bar{X}$ (SD)	Mean Gain
Experimental I	ZVP	73	15.78 (3.89)	21.73 (4.21)	5.95

From the results shown in Table 2 on the mean comparison of students' performance who learned Computer Studies using Zoom Videoconferencing Platform (ZVP), it was shown that they had a mean performance score of 15.78 (SD = 3.89), and a posttest mean rating of 21.73 (SD = 4.21) which resulted in a mean difference of 5.95. This result suggests that using ZVP had a positive effect on students' performance in Computer Studies.

**Research Question Three:** What is the difference between the pretest and posttest mean performance scores of students taught Computer Studies using the Google Meet Videoconferencing Platform (GMVP)?

**Table 3: Comparison of mean performance scores of students taught Computer Studies Google Meet Videoconferencing Platform (GMVP)**

Group	Treatment	n	Pre-test $\bar{X}$ (SD)	Post-test $\bar{X}$ (SD)	Mean Gain
Experimental 2	GMVP	75	14.31 (2.75)	22.61 (4.20)	8.30

From the results shown in Table 3 on the mean comparison of students' performance taught Computer Studies Google Meet Videoconferencing Platform (GMVP), it was shown that they had a mean performance score of 14.31 (SD = 2.75), and a posttest mean rating of 22.61 (SD = 4.20) which resulted in a mean difference of 8.30. This result suggests that using GMVP had a positive effect on students' performance in Computer Studies.

**Hypothesis One:** There is no significant difference between the pretest and posttest mean interest ratings of students taught Computer Studies using the Zoom Videoconferencing Platform (ZVP) and those taught using Google Meet Videoconferencing Platform (GMVP).

**Table 4: Summary of Analysis of Covariance (ANCOVA) on mean ratings of students taught Computer Studies using the Zoom Videoconferencing Platform (ZVP) and those taught using Google Meet Videoconferencing Platform (GMVP).**

**Tests of Between-Subjects Effects**

Dependent Variable: Posttest

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	301.662 <sup>a</sup>	2	150.831	13.565	.000
Intercept	545.643	1	545.643	49.071	.000
Pre_test	164.738	1	164.738	14.815	.000
Groups	118.705	1	118.705	10.675	.002
Error	1045.224	146	11.119		
Total	16217.000	147			
Corrected Total	1346.887	146			

a. R Squared = .224 (Adjusted R Squared = .207)

From the result displayed in Table 4, it can be observed that when the pretest of students on interest was used as a covariate for the ANCOVA analysis, an F-value of 10.675 was obtained with a corresponding p-value of 0.000 at 1 and 146 degrees of freedom. Since the p-value obtained, 0.000 was lesser than the chosen alpha guiding the study (0.05), it, therefore, implies that students taught Computer Studies using the GMVP had significantly better interest mean ratings than those taught using the ZVP. The null hypothesis is therefore rejected.

**Hypothesis Two:** Significant difference does not exist between the pretest and posttest mean performance scores of students taught Computer Studies using the Zoom Videoconferencing Platform (ZVP).

**Table 5: Paired sample t-test on the pretest and post-test mean performance scores of students taught Computer Studies using the Zoom Videoconferencing Platform (ZVP)**

ZVP	Mean	Std. Dev	N	df	t	p	Decision
Pretest	15.78	3.89	73	71	8.319	0.0005	Reject H <sub>0</sub>
Posttest	21.73	4.21					

The result of the analysis on the pretest and post-test mean performance scores of students taught Computer Studies using the Zoom Videoconferencing Platform (ZVP), showed that the difference between the pre-test mean performance score (15.78, SD = 3.89) and the post test scores (21.73, SD = 4.21) when tested with paired sample t-test yielded a t-value of 8.319 at 71 degrees of freedom with a corresponding p-value of 0.0005, which was lesser than the chosen alpha of 0.05 for the study. Since the p-value at which the result was obtained (0.0005) was lesser than the chosen alpha of the study, it, therefore, indicates that the difference between the pretest and posttest mean performance scores of students taught Computer Studies using the Zoom Videoconferencing Platform (ZVP) was statistically significant. The null hypothesis was therefore rejected.

**Hypothesis Three:** There is no significant difference between the pretest and posttest mean performance scores of students taught Computer Studies using the Google Meet Videoconferencing Platform (GMVP).

**Table 6: Paired sample t-test on the pretest and posttest mean performance scores of students taught Computer Studies using the Google Meet Videoconferencing Platform (GMVP)**

GMVP	Mean	Std. Dev	N	df	t	p	Decision
Pretest	14.31	2.75	75	73	12.007	0.0005	Reject Ho5
Posttest	22.61	4.20					

The result of the analysis on the pretest and post-test mean performance scores of students taught Computer Studies using the Google Meet Videoconferencing Platform (GMVP), showed that the difference between the pre-test mean performance score (14.31, SD = 2.75) and the post-test scores (22.61, SD = 4.20) when tested with paired sample t-test yielded a t-value of 12.007 at 73 degrees of freedom with a corresponding p-value of 0.0005, which was lesser than the chosen alpha of 0.05 for the study. Since the p-value at which the result was obtained (0.0005) was lesser than the chosen alpha of the study, it, therefore, indicates that the difference between the pretest and posttest mean performance scores of students taught Computer Studies using the Google Meet Videoconferencing Platform (GMVP) was statistically different. The null hypothesis was therefore rejected.

## DISCUSSION OF FINDING

The results of research question one, which was presented in Table 1, revealed that students who were taught using Zoom Videoconferencing Platform (ZVP) had a mean gain of 18.05, while those taught using Google Meet Videoconferencing Platform (GMVP) had a mean gain of 24.17. This result

suggests that GMVP had a greater effect on the mean rating of students' interests in Computer Studies than using ZVP. This is an indication that the two platforms had positive effects; Google Meet Videoconferencing Platform had a higher positive effect on the students' interest rating than the Zoom Videoconferencing Platform. This finding validates the study of Setyawan, Aznam and Citrawati (2020) who investigate the effect of the Google Meet media-assisted lecture method on building student knowledge and learning outcomes while learning from home. This finding further corroborates the findings Edeh, Nwafor, Ezeanya, Eziokwu and Ani (2020) which showed that the use of e-learning platforms such as Zoom and Google Meet platforms had statistically significant effects on the learning interests of students. Thus, they concluded that the use of e-learning platforms should be encouraged, but the transition has to be gradual to enable the actors to understand the new learning strategy, and how to maximize its potential. The result of the test of hypothesis one, which was presented in Table 4, showed that the p-value was lesser than the chosen alpha guiding the study (0.05), it, therefore, implies that students taught Computer Studies using the GMVP had a significantly better interest mean ratings than those taught using the ZVP. The null hypothesis is therefore rejected. This finding agrees with Hussaini, Ibrahim, Wali, Libata and Musa (2020) who indicated that Google Apps such as Google Meet and Classroom are effective in improving students' access and attentiveness towards learning, knowledge, and skills gained through these platforms make students active learners and provide meaningful feedback to both students and parents.

The results of research question two, which was presented in Table 2, revealed that the mean gain between the pretest and posttest performance scores of students taught Computer Studies using Zoom Videoconferencing Platform (ZVP) was 5.95. This result suggests that using ZVP had a positive effect on students' performance in Computer Studies. Again, the result of the test of hypothesis two, which was presented in Table 5, showed that the p-value was lesser than the chosen alpha for the study, it, therefore, indicates that the difference between the pretest and posttest mean performance scores of students taught Computer Studies using the Zoom Videoconferencing Platform (ZVP) was statistically different. The null hypothesis was therefore rejected. This agrees with Akpan, Etim, and Ogechi (2016) that the availability and use of virtual classrooms influenced students' academic performance, also, Kim (2020) corroborates this finding with the discovery that Zoom video lectures have a positive effect on learners' achievement. Kim finding also found that learners were satisfied with zoom video lectures for the following reasons; increased interest in and motivation towards learning, self-directed learning, active interaction, ease of access and ease of information retrieval. However, this finding disagrees with Eminue, Garba and Njoku (2020) who found out in their study that students taught Accounting using traditional (face-to-face) methods perform better than those taught using synchronous (video conferencing or virtual classroom) instructional strategies. Their findings also revealed that there is a significant difference in the academic performance of students taught Accounting using synchronous (video conferencing or virtual classroom) instructional strategies and those taught using the traditional method with those taught through the traditional method performing better.

The results of research question three, which was presented in Table 3, revealed that the mean gain between the pretest and posttest performance scores of students taught Computer Studies using Google Meet Videoconferencing Platform (GMVP) was 8.30. This result suggests that using GMVP had a positive effect on students' performance in Computer Studies. The result of the test of hypothesis five which was presented in Table 6, showed that the p-value was lesser than the chosen alpha for the study, it, therefore, indicates that the difference between the pretest and posttest mean performance scores of students taught Computer Studies using the Google Meet Videoconferencing Platform (GMVP) was statistically different. The null hypothesis was therefore rejected. This finding is in line with Edeh, Nwafor, Ezeanya, Eziokwu and Ani (2020) who investigated the impact of e-learning platforms on students' interest and academic achievement in data structure course. The result showed a statistically significant difference between the academic achievements of the students taught using e-learning platform (Google Meet). This also corroborates the finding of Setyawan, Aznam and Citrawati (2020) who found that the method of lectures assisted by Google Meet media has a significant influence on building knowledge and student learning outcomes in lecturing learning strategies in elementary schools.

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## CONCLUSION

Based on the results obtained in this study, it was concluded that Zoom and Google Meet Videoconferencing Platforms enhanced students' interest and academic performance in Computer Studies. This is an indication of the efficacy of videoconferencing platforms in teaching and learning especially if properly integrated. This study proved that the continuous use of e-learning platforms will improve educational outcomes, especially in ICT-related subjects

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## RECOMMENDATIONS

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

1. Secondary schools should consider the adoption of learning management systems and videoconferencing platforms for increased acceptance of e-learning in the teaching and learning of ICT-related subjects.
2. Curriculum developers and planners should adopt videoconferencing and other e-learning platforms as well as create more channels where learning would take place outside the classroom.
3. Government, school administrators and other educational stakeholders should provide innovative digital devices for teachers and students as well as organise workshops, seminars and practical training to expose teachers to new technologies for teaching.

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