



# Effects of Forum Method on Senior Secondary School Students' Achievement in Geography Map Work in Plateau State, Central Nigeria.

<sup>1</sup>Dickson S. Dakur (Ph.D)

*Department of Science and Technology Education, Faculty of Education,  
University of Jos, Nigeria.*

<sup>2</sup>Kim D. Istifanus

*Department of Science and Technology Education, Faculty of Education,  
University of Jos, Nigeria.*

*Corresponding Author: Dickson S. Dakur (Ph.D)*

Date of Submission: 08-06-2024

Date of Acceptance: 21-06-2024

**ABSTRACT:** The study investigated effects of forum method of teaching on senior secondary school students' achievement in Geography map work in Plateau State, Central Nigeria. The researcher formulated and answered four research questions and tested five hypotheses at 0.05 level of significance. Quasi-Experimental non-equivalent groups design was employed for the study. The population constituted 22,190 SS II Geography students in the study area and a sample of 125 was used for the study. A Geography Map Work Achievement Test (GMWAT) was used for data collection. The GMWAT comprised of objective and essay items adopted from WAEC geography examinations on map work for four years. The instrument was validated by three experts, which included two in Geography Education and one from Educational Test and Measurement. The reliability of the GMWAT was computed using Pearson Product Moment method and the reliability coefficient was 0.77. Data collected with the instrument was analyzed using mean score and standard deviation to answer the research questions, while t-test of independent samples, analysis of covariance (ANCOVA) and analysis of variance (ANOVA) were used to test the hypotheses. Findings of the study revealed that Forum Method was effective in increasing the achievement of students in geography map work with some level of discrimination between gender groups in favour of male students. The treatment also discriminated between public and private school students in favour of private schools. Some recommendations were made based on the findings of the study.

**Keywords:** Forum method, Achievement, Geography, Map work.

## I. INTRODUCTION

Geography is science of the earth that studies both natural and human phenomena by applying the techniques and methodologies of the natural and social sciences. Hartshorne (2012) in allusion to Gerland conceptualised Geography as the study of human ecology, essentially dealing with the study of social science in relation to natural science. This understanding of Geography portrays the subject as a science of relationship between man and nature and thus reveals its dualistic nature as physical and human science, hence, the development of the concept of physical and human Geography. Development in the knowledge of Geography over time have led to varying opinions on the nature of the subject as: science of the planet earth, science of relationship, science of distribution or of location, and area analysis science. Understanding of Geography as science of the planet earth evolved over time and today is considered as physical Geography of landforms, weather and climate, and human impact on the environment. The concept of Geography as science of relationship metamorphosed from anthropogeography to human ecology to mean the study of relationship between human population and the natural environment. Today it is termed human Geography being studied as population, cultural, spatial interaction and political geographies. As science of distribution or location, Geography is primarily concerned with the study of the distribution of different phenomena, separately and in relationship to each other over the earth



(Hartshorne, 2012). Today, Geography as science of distribution include economic Geography, Geography of natural resources and urban Geography. Geography as areal analytical science, later called systematic science and today as regional geography, is concerned with the study of phenomena ( for instance, mineral, fauna and flora) in discrete Geographical areas and how the areas differ from each other in the distribution of these phenomena.

The Nigerian National Policy on Education (NPE) recognizes Geography as one of the core subjects to be taught at the senior secondary school level all over the nation. The senior secondary school geography curriculum developed by the National Educational Research and Development Council (NERDC, 2007) is comprehensive, featuring the different aspects of geography identified as themes. These themes include Local Geography, Earth and the Solar System, Environment and its Resources, Regional geography of Nigeria, Map Reading and Interpretation (referred to as map work in this study), Economic and Human Geography and Introduction to Geographic Information Systems (GIS). These themes highlight learning experiences in the subject that relevant for the training of professionals in teaching, cartography, tourism, geomorphology, meteorology/climatology, biogeography, hydrology, oceanography, surveying, GIS, urban planning, development studies, remote sensing and pedology, who could play key roles in building the societies and improving national life in general.

Map work is a major component of the senior secondary school geography curriculum. It is a theme in Geography that offers opportunities for learners to acquire knowledge on spatial area in relation to natural land and artificial features such as the development of cities or landforms (Dlamini, 2014). This connotes that map work deals with the recognition of the different representations of physical and human features shown on a map and making sense of their spatial relationship with reality. Students learn representation of relief and drainage features, read contours, read and interpret human activities on mapped areas, depict shapes of terrains, locate places, measure distances and relate it with reality. Maps and map work are integral tool and aspect in geography in the West African Senior Secondary Certificate Examination (WASSCE) and the Senior secondary certificate examination (SSCE) organized by the National Examination Council (NECO).

Map Work spreads across the senior secondary school geography curriculum in Nigeria

(SS 1 - SS 3). In WASSCE and SSCE, Map work forms 10 out of 50 objective test questions in Paper one. For paper three, students are required to answer one compulsory question on Map work (Elementary, Practical and Physical Geography), accounting for 25 out of 70 marks. Map work thus contributes significant number of items and scores in WASSCE and SSCE that students' failure in it would result to failure in the overall examinations. This implies that any candidate who is ill-equipped for Map Work is not likely to make good grades in WASSCE and SSCE and qualify to pursue further studies and careers in Geography, required for national development.

To achieve maximum learning outcome, necessary for attainment of the objectives of geography education, Sustainable Development Goals (SDGs, 2015) inclusive, active methods, including Forum must arguably be applied in the teaching and learning process of the subject. Forum method could be particularly useful in achieving the objectives of geography map work. Forum method of teaching involves settings where students interactively share ideas and actively learn from class discussions, case studies and reading of printed materials (Hamzeh&Jacobs, 2010). In another conceptualization, forum is a suitable verbal activity whereby students share their knowledge and experience directly to deliver ideas and thoughts in a clear, creative, objective and rational manner (Wan Hassan et al., 2015). It is a student-centered teaching method prepared to be simple, interesting and yet challenging to match the skills, achievements and age levels of the students. Practically, Wan Hassan et al. explained thus: using the forum method, the class is organized into a discussion panel where panelists express their ideas, listen to others' ideas, and learn collectively. These opinions on forum method suggest that it is a meeting or medium where ideas and views on a particular common issue can be exchanged. This ensures that all participants leave the forum with more understanding than they brought to the table. This means that forum method is composed of discussions, cooperative learning, questions/answer sessions and hands-on (experiential) learning. Two broad types forums method exist in literature: physical forum (also referred to as open forum, open discussion forum, forum method) (Hamzeh & Jacobs, 2010; Pai, 2012), and online discussion forum (also referred to as massive online discussion forum) (Callaghan & Lazard, 2012; Edeh et al, 2019; Khlaif et al, 2017). The physical forum also referred to as Forum Method was used for the study.



Active learning teaching methods, forum inclusive, have been found to increase achievement of students in Geography, for instance, Experiential Learning Strategy was found to be effective in increasing achievement of senior secondary school students in Physical and Human Geography (Dakur et al., 2021), Online Discussion Forum method yielded better achievement (Alzahrani, 2017), Field Trip and Land Laboratory methods improved students achievement in poultry production (Onah, 2017) and the use of Portfolio Assessment Technique improved Geography students' achievement in geography map sketching and location (Ugodulunwa & Wakjissa, 2015). There could also be a significant relationship between students' gender and achievement (Amosun, 2016) and school type and students' achievement (Adeyemi, 2014; Ahmed, Ahmed & Butt, 2017). Achievement of students in a subject is notable because it is the major tool for measuring academic progress and success. This view was held in researches including York et al. (2015) and Bolandifar and Noordin (2013), who submitted that learning outcomes such as Grade Point Average and Cumulative Grade Point Average were accepted as viable measures of students' achievement. This indicates that students' achievement in any subject is imperative in measuring students' progress, hence teachers should employ teaching methods that enhance it.

Despite the attempts of scholars and researchers to improve learning and students' learning outcome in Geography, it is worrisome that statistics from Educational Resource Centre Jos Plateau state Nigeria, (ERC, 2023) shows that as high as 71.9% of candidates who sat for WASSCE in the study area between 2015 and 2022 could not pass with credit. In 2020, only 20.1% passed geography at credit level, a situation which is reflected in the other years. The WAEC Chief Examiner report for 2015-2023 revealed the areas of weaknesses of candidates to include: very poor map work, wrong map work, and wrongly answered questions on map work. The Chief examiner concluded that geography students found it difficult to answer questions on map work. This phenomena is most likely the reason students don't make good grades in geography examinations. Despite the importance of map work to students' success in Geography's external examination (WASSCE & SSCE) students have continued to perform poorly in the aspect and thus serve as the motivation for this study. The central question of the study is 'could the use of forum method improve of students' achievement in Geography map work?'

### Objectives:

The purpose of the study was to investigate the effects of forum method on senior secondary school students' achievement in geography map work in Plateau State, Central Nigeria. Specific objectives of the study included determining:

1. Pre-test map work achievement mean scores of the experimental and control groups.
2. Post-test map work achievement mean scores of the experimental and control groups.
3. Post-test achievement mean scores of male and female students in the experimental group.
4. Post-test achievement mean scores of public and private school students in the experimental group.
5. Interaction effect of gender and treatment on post-test map work achievement scores.

### Research Questions:

The following research questions were answered during the study:

1. What is the pre-test map work achievement mean scores of the experimental and control groups?
2. What is the post-test map work achievement mean scores of the experimental and control groups?
3. What is the post-test achievement mean scores of male and female students in the experimental group?
4. What is the post-test achievement mean scores of public and private school students in the experimental group?

### Hypotheses:

The following research hypotheses were tested at 0.05 level of significance during the study:

1. There is no significant difference between the experimental and control groups on the pre-test achievement mean scores.
2. There is no significant difference between the experimental and control groups on the post-test achievement mean scores.
3. There is no significant difference between male and female students in the experimental group on post-test achievement mean scores.
4. There is no significant difference between public and private school students in the experimental group on post-test achievement mean score.
5. There is no significant interaction effect of gender and treatment on post-test map work achievement scores of students in the experimental groups.



## II. METHODOLOGY

### Research Design

The study employed the quasi-experimental research design, particularly the non-equivalent pre-test, post-test control group design. Quasi-experimental design was considered appropriate because it was not possible for the researcher to randomly assigned students to the experimental and control groups without disrupting the arrangement of the schools involved in the study. Hence, intact classes were used.

### Sample and Procedure

The target population was the senior secondary Two (SS II) students that offered geography in Plateau State, Central Nigeria. This involved 22,190 students of geography in schools in the study area. Multi-stage and stratified sampling techniques were used for the study. Multi-stage sampling was used to randomly determine the local government area (LGA) the study would take place and Jos South local government area was finally choice. Stratified sampling was used to select public and private school students for the study. The stratified process gave rise to 125 (78 males & 47 female) geography student in two schools each from the public and private. Four intact classes (two private and two public) were used for the study. Two intact classes, one each from private and public schools were used as the experimental group, and likewise for the control group.

### Instruments

Geography Map Work Achievement Test (GMWAT) was used for data collection. The GMWAT consisted of 32 items adopted from WASSCE 2013-2016, consisting of 30 multiple choice and two essay questions. Three experts, two from Geography Education and one from Educational Test and Measurement, from University of Jos validated the instrument. The reliability coefficient of GMWAT was computed using Pearson Product Moment method, after a pilot study on a

sample separate from the one under study, the coefficient of 0.77 was obtained.

### Statistical Analysis

Mean and standard deviation were used to answer the research questions, while t-test of independent samples, analysis of covariance (ANCOVA) and analysis of variance (ANOVA) were used to test the hypotheses.

### Data Collection Procedure

The GMWAT was administered by trained research assistants to the students under close supervision of the researchers in both experimental and control groups before the commencement of the treatment to determine the students' entry knowledge of Geography Map Work. The experimental group was taught geography map work by the trained research assistants using Forum Method for six weeks. Similarly, the control group was taught geography map work by the research assistants but using other teaching methods for a period of six weeks. The teaching contents were the same for the experimental and control groups, but differed in the method of delivery. Treatment for the experimental group, included an introduction of the forum, sitting of panelists and audience, panel discussion, audience engagement and networking (through discussions, questioning, cooperation and hands-on engagement), feedback, and resource sharing. At the completion of the period of treatment, GMWAT was administered to both experimental and control groups (post-test). Data collected during the pre-test and post-test of was used to answer the research questions and testing the hypotheses of the study.

## III. RESULTS

The four research questions and five hypotheses were answered and tested respectively and the results are presented as follows:

**Research Question One:** This sought to measure the pre-test achievement mean scores of the experimental and control groups.

**Table 1: Summary of Results of Pre-test Achievement Mean Scores of the Experimental and Control Groups**

Group	N	Mean ( $\bar{x}$ )	Standard Deviation (SD)	Mean Difference
Control	60	17.92	5.25	0.27
Experimental	65	17.50	5.52	

The data in Table 1 reveals that the control group had a pre-test achievement mean score of 17.92 and standard deviation of 5.25, while the experimental group had an achievement mean score of 17.50 and standard



deviation of 5.52. The mean difference between the experimental and control groups was 0.27. This clearly shows that the two groups achieved nearly equal in pre-test.

**Research Question Two:** This research question sought to measure the post-test achievement mean scores of the experimental and control groups.

**Table 2: Summary of Results of Post-test Achievement Mean Scores of the Experimental and Control Groups**

Group	N	Mean ( $\bar{x}$ )	Standard Deviation (sd)	Mean Difference
Control	60	39.50	11.38	23.02
Experimental	65	62.52	14.26	

The data in Table 2 shows that the control group had a post-test achievement mean score of 39.50 and standard deviation of 11.38, while the experimental group had an achievement mean score of 62.52 and standard deviation of 14.26. The mean difference of 23.02 was obtained in favour of the experimental group.

**Research Question Three:** This research question sought to determine the post-test achievement mean scores of male and female students in the experimental group.

**Table 3: Summary of Results of Post-test Achievement Mean Scores of Male and Female Students in the Experimental Group**

Group	N	Mean ( $\bar{x}$ )	Standard Deviation (sd)	Mean Difference
Male	41	70.37	8.83	21.24
Female	24	49.13	11.55	

Data in Table 3 shows that 41 males had a post-test achievement mean score of 70.37 and standard deviation 8.83, while 24 females had an achievement mean score of 49.13 and standard deviation 11.55. The mean difference of 21.24 was obtained in favour of male students.

**Research Question Four:** This research question sought to measure the post-test achievement mean scores of public and private school students in the experimental group.

**Table 4: Summary of Results of Post-test Achievement Mean Scores of Public and Private School Students in the Experimental Group**

Group	N	Mean ( $\bar{x}$ )	Standard Deviation (sd)	Mean Difference
Public	23	47.22	10.90	23.68
Private	42	70.90	7.09	

Table 4 shows that public school students in the experimental group obtained post-test achievement mean score of 47.22 (SD =10.90) and private school students had an achievement mean score of 70.90 (sd=7.09). The mean difference of 23.68 in favour of Private schools means that private school students obtained higher scores on the post-test achievement than public school students.

**Hypothesis One:** This hypothesis tested significant difference between the experimental and control groups on pre-test achievement mean scores. Table 5 contains the test results for this hypothesis.

**Table 5: Results of t-Test Analysis of Significant Difference between the Experimental and Control Groups on Pre-test Achievement Mean Scores**

Group	N	Mean ( $\bar{x}$ )	Mean Difference	df	t	Sig. (2-tailed) ( $\rho$ -value)	Decision
Control	60	17.91	.42	123	.44	.66	Accept
Experimental	65	17.49					



Table 5 shows the results of t-test of independent samples of significant difference between the experimental and control groups on pre-test achievement mean scores. The results show that  $t(123) = .44$  and  $p$ -value = .66. Since the  $p$ -value (.66) is greater than .05, we had no sufficient evidence to reject the null hypothesis. The null hypothesis was therefore accepted, and thus concluded that there was

no significant difference between the experimental and control groups on the pre-test achievement mean score.

**Hypothesis Two:** This hypothesis tested significant difference between the experimental and control groups on the post-test achievement mean scores. Table 6 contains the test results for this hypothesis.

**Table 6: Result of Analysis of Covariance (ANCOVA) of Significant Difference between Experimental and Control Groups on the Post-test Achievement Mean Scores**

Source	Type III Sum of Squares	df	Mean Square	F	Sig. of F (p-value)	Decision
Corrected Model	16573.044 <sup>a</sup>	2	8286.522	49.028	.000	Reject
Intercept	25421.527	1	25421.527	150.408	.000	
Achievement Pretest	35.108	1	35.108	.208	.649	
Group	16572.350	1	16572.350	98.05	.00	
Error	20620.108	122	169.017			
Total	368364.000	125				
Corrected Total	37193.152	124				

**a. R Squared = .446 (Adjusted R Squared = .437)**

Data in Table 6 is the results of ANCOVA test of significant difference between the experimental and control groups on post-test achievement mean scores using SPSS (20). The results show that  $F(1,122) = 98.05$  and  $p$ -value ( $p = .00$ ). Since the  $p$ -value is less than .05, there is sufficient evidence to reject the null hypothesis. This means there was a significant difference between the experimental and control groups on

post-test achievement mean scores in favour of the experimental group and therefore concluded that the treatment increased students' achievement in Geography map work.

**Hypothesis Three:** This hypothesis tested significant difference between male and female students in the experimental group on post-test achievement mean scores. Table 7 contains the test results for this hypothesis.

**Table 7: Results of Analysis of Covariance (ANCOVA) of Significant Difference between Male and Female Students on Post-test Achievement Mean Scores**

Source	Type III Sum of Squares	df	Mean Square	F	Sig. of F (p-value)	Decision
Corrected Model	6835.883 <sup>a</sup>	2	3417.941	34.299	.000	Reject
Intercept	19156.586	1	19156.586	192.238	.000	
Achievement Pretest (Exp)	5.805	1	5.805	.058	.810	
Gender (Exp)	6070.964	1	6070.964	60.92	.00	
Error	6178.333	62	99.651			
Total	267108.000	65				
Corrected Total	13014.215	64				

**a. R Squared = .525 (Adjusted R Squared = .510)**

Table 7 shows the results of the test of significant difference between male and female students in experimental group on post-test achievement mean scores using SPSS (20). The results revealed that  $F(1, 62) = 60.92$  and  $p = .00$ . Since  $p = .00 < .05$ , the null hypothesis was rejected. This shows a statistically significant of difference between gender groups on posttest achievement mean scores.

**Hypothesis Four:** This hypothesis tested significant difference between public and private school students on post-test achievement mean score in the experimental group. Table 8 contains the test results for this hypothesis.



**Table 8: Results of Analysis of Covariance (ANCOVA) of Significant Difference between Public and Private School Students on the Post-test Achievement Mean Scores.**

Source	Type III Sum of Squares	df	Mean Square	F	Sig. of F (p-value)	Decision
Corrected Model	8928.566 <sup>a</sup>	2	4464.283	67.746	.000	Reject
Intercept	14208.039	1	14208.039	215.608	.000	
Achievement Pretest (Exp)	589.883	1	589.883	8.952	.004	
School	8163.648	1	8163.648	123.88	.00	
Error	4085.649	62	65.898			
Total	267108.000	65				
Corrected Total	13014.215	64				

**a. R Squared = .686 (Adjusted R Squared = .676)**

Data in Table 8 presents results of ANCOVA test of significant difference between public and private school students in the experimental group on post-test achievement mean scores using SPSS (20). The results showed that  $F(1, 62) = 123.88$  and  $p\text{-value} = .00$ . Since  $p < .05$ , there is sufficient evidence to reject the null hypothesis. This means there was a statistically significant difference between public and private

schools on t post-test achievement mean scores. It was therefore concluded that public and private school students responded differently to forum method of teaching.

**Hypothesis Five:** This hypothesis tested significant interaction effect of gender and treatment on post-test map work achievement scores. Table 9 contains the test results for this hypothesis.

**Table 9: Results of Analysis of Variance (ANOVA) of Significant Interaction Effect of Gender and Treatment on Post-test Achievement Score.**

Source	Type III Sum of Squares	Df	Mean Square	F	Sig. of F (p-value)	Decision
Corrected Model	27588.924 <sup>a</sup>	3	9196.308	115.861	.000	Reject
Intercept	277638.833	1	277638.833	3497.866	.000	
Group	13530.542	1	13530.542	170.47	.00	
Gender	10087.810	1	10087.810	127.09	.00	
Group * Gender	769.894	1	769.894	9.70	.00	
Error	9604.228	121	79.374			
Total	368364.000	125				
Corrected Total	37193.152	124				

**a. R Squared = .742 (Adjusted R Squared = .735)**

Table 9 presents results of ANOVA test of interaction effect of gender and treatment (Group \* Gender) on post-test achievement using SPSS. The table shows that  $F(1, 121) = 9.70$  while  $p\text{-value} (p=.00)$ . The hypothesis of no significant interaction effect of gender and treatment on post-test map work achievement scores was therefore rejected on the ground that  $p < .05$ . This clearly showed that there is a statistically significant interaction effect of treatment (Forum method) and gender (male and female) on students' achievement mean score in geography map work. The decision means that the post-test achievement score of a student were influenced by the interaction of gender and the treatment (forum method).

#### IV. DISCUSSION

Findings of the study revealed that the achievement mean score of the experimental group was higher than the control group, an indication that students taught geography map work using Forum Method achieved higher scores than those not taught with it. Therefore, Forum Method positively influenced students' achievement in Geography map work. Thus, the use of forum method in teaching resulted to effective learning of Geography map work. Based on data analysis, there is statistically significant difference between the experimental and control groups in favour of the experimental group. This finding of the



corroborates the reports of El-Yakubu (2016), Onah (2017) and Dakur et al. (2021) who found that the use of active teaching methods increased achievement of students in geography.

Results of the study further showed that forum method increased the achievement of male students in Geography map work than their female counterparts. This is confirmed by the result which showed that there was an interaction effect of gender and treatment on the students' achievement in Geography Map work. This result supported Filgona et al (2016) and El-Yakubu (2016) who posited that gender could have positive or negative effects on the achievement of students. Contrary to this position is that of Ajai and Imoko (2015) and Ugodulunwa and Wakjissa (2015) who reported that gender does not affect students' achievement.

Findings of the study also showed that forum method impacted more positively on private school students than public schools. This could be as a result of preexisting difference in the schools' learning environment and culture which strong factors in teaching and learning. Adeyemi (2014) and Ahmed, Ahmed and Butt (2017) submitted that achievement of students in public and private schools differed significantly. On the contrary, Rasool (2018) in a study on academic achievement of government and private secondary school students with respect to their school environment reported that the achievement of student in government and private schools did not differ significantly.

## V. CONCLUSION

The inferences from the study are strong grounds to conclude that students taught geography map work using Forum Method achieved significantly higher than those students not taught with it, but with a bias in favour of male and private school students as against female and public school students.

## VI. RECOMMENDATIONS

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

1. Education stakeholders and policy makers at national and sub-national levels should gazette a policy seeking the inclusion of Forum Method as one of the teaching methods for the implementation of the senior secondary geography curriculum in the coming curriculum review.
2. Workshops and seminars should be organized on the use of Forum Method to give teachers better understanding and application of the method in the teaching learning setting.

3. Teachers of geography should be encouraged to use Forum Method to teach geography map work as it has proven to be effective in enhancing achievement.

4. Government at Federal and State levels should provide resources for adequate use of forum method. This could include sufficient textbooks, maps, computers, tracing papers and plane papers.

## REFERENCES

- [1]. Adeyemi, S. B. (2014). Comparative study of pupils' academic performance between private and public primary schools. *World Journal of Education*, 4(4), 55-60.
- [2]. Ahmed, S. Z., Ahmed, H. Z. & Butt, M. N. (2017). Comparative study of students' academic performance between private and public high schools of Wah Cantt. *Journal of Education and Practice*, 8(16), 24-29.
- [3]. Ajai, J. I. & Imoko, B. I. (2015). Gender differences in mathematics achievement and retention scores: a case of problem-based learning method. *International Journal of Resources in Education and Science*, 1, 45-50.
- [4]. Alzahrani, M. (2017). The effect of using online discussion forums on students' learning. *The Turkish Journal of Educational Technology*, 16(1), 164-176.
- [5]. Amosun, P. (2016). Why Nigerian geography teachers scarcely and scantily teach map reading and why students are scared of it. *African Educational Research Journal*, 4(2), 42-48.
- [6]. Callaghan, J. E. M. & Lazard, L. (2012). Please don't put the whole dang thing out there!: A discursive analysis of internet discussions around infant feeding. *Psychol Health*, 27(8), 938-955.
- [7]. Bolandifar, S. & Noordin, N. (2013). Investigating the Relationship between creativity and academic achievement of Malaysian Undergraduates. *Sains humanika*, 65(2), 10-15.
- [8]. Dakur, D. S., Damar, D. N. & Dabi, D. D. (2021). Exploring experiential learning strategy for mastery learning in geography among senior secondary school students in Mangu Local Government, Plateau State, Nigeria. *Nigerian Journal of Curriculum Studies*, 28(2), 40-52.
- [9]. Dlamini, R. (2014). Teachers' perception of dynamic software to teach geographical mapwork skills in classroom. In: De Almeida.



- [10]. Edeh, M.O., Edeh, C.D., Alhuseen, O.A. & Naveed, S.S. (2019). Online discussion forum as a tool for interactive learning and communication. *International Journal of Recent Technology and Engineering*, 8(4), 4852-4859.
- [11]. Educational Resource Centre (ERC). (2023). WAEC and NECO results analysis. Jos: ERC.
- [12]. El-Yakubu, L. (2016). Effect of computer simulation on students' achievement in map reading and interpretation in Taraba State. *Trends in Science and Technology Journal*, 1(2), 595-598.
- [13]. Filgona, J., Linus, K. & Filgona, J. (2016). Effect of hands-on learning strategies on senior secondary school students' achievement in topographical map studies in Ganye Educational Zone, Adamawa State, Nigeria. *International Journal of Social Science and Humanities Research*, 4(3), 276-287.
- [14]. Hamzeh, F.R. & Jacobs, F. (2010). Open forum as an active learning method for. *Proceeding of the Lean Advancement Initiative 5th LAI/EdNet Lean Educator Conference* (pp. 5-8). Florida: Colorado State University, Colorado.
- [15]. Hartshorne, R. (2012). *The of Geography: A Critical Survey of Current Thought in the Light of the past*. New Delhi: Rawat Publications.
- [16]. Khlaif, Z. (2017). Types of interaction in online discussion forums: A case study. *Journal of Educational Issues*, 3(1), 155-169.
- [17]. MacDonald T. (2019). *Geography*. Oxford University Press:
- [18]. <https://www.google.com/search?client=firefox-b-d&q=meaning+of+geography>
- [19]. Nigerian Educational Research and Development Council (NERDC). (2007). *Geography curriculum SS 1 - SS 3*. Abuja: NERDC.
- [20]. Onah, G. (2017). Effects of field trip and laboratory activities on students' interest in poultry production in senior secondary schools in Nsukka, Enugu State, Nigeria. Nsukka: Unpublished Ph.D. Thesis, university of Nigeria, Nsukka.
- [21]. Pai, B. (2012). Using Online Quizzes and Discussion Forum to Enhance Learning Numerical Methods. *Proceeding of the 119th ASEE Annual Conference and Exposition* (pp. 7-11). San Antonio, Texas: ASEE.
- [22]. Rasool, R. (2018). Academic achievement of government and private secondary school students with respect to their school environment. *International Journal of Movement Education and Social Science*, 7(2), 162-170.
- [23]. Sustainable Development Goals (2015). *Sustainable Development Goals*. National Geographic:  
<https://education.nationalgeographic.org/resource/sustainable-development-goals/>
- [24]. Ugodulunwa, C. & Wakjissa, S. (2015). Use of portfolio assessment technique in teaching map sketching and location in secondary school geography in Jos, Nigeria. *Journal of Education and Practice*, 6(17), 23-30.
- [25]. Wan Hassan, W.Z., Jamsari, E.A., Taha, M., Basir, A., Alias, J & Muslim, N. (2015). Effectiveness of
- [26]. the forum method for the self development course in UKM and its link with student interest. *Turkish Online Journal of Distance Education*, 16(3), 88-101.
- [27]. West African Examination Council. (2019, June 28). e-Learning. West African Examination Council:  
<https://waeconline.org.ng/elearning/Geography/Geo218nq9.html>.
- [28]. West African Examination Council (2023). *Offline Registration System (WASSCE for school*
- [29]. *Candidates*). WAEC Online:  
<https://waeconline.org.ng/schoolsofflineinstallation/install.htm>
- [30]. West African Examination Council (2015-2020). *West African Senior School Certificate Examination*:
- [31]. Chief Examiners' Reports. Ilupeju Lagos: West African Publishers Limited.
- [32]. York, T. T., Gibson, C. & Rankin, S. (2015). *Defining and Measuring Academic Success*.
- [33]. *Practical Assessment, Research, and Evaluation*, 20(5), 1-20.