

Effects of Multiple Intelligence Teacher Approach on Students' Interest and Achievement in Environmental Education Contents in Geography in Senior Secondary School in Nsukka Education Zone of Enugu State, Nigeria

By

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The study investigated the effect of multiple intelligence teacher approach on students' interest and achievement in Environmental Education contents in Geography in senior secondary school Nsukka Education Zone Enugu State, Nigeria. The study was guided by four research questions and four null hypotheses. The study adopted quasi experimental research design. The population of the study consists of 1552 senior secondary Two (SS2) students offering Geography in the 59 public secondary schools in Nsukka Education zone of Enugu State. Sample size for the study was 108 (48 males and 60 females) students in two SS2 intact classes drawn from two co-educational public secondary schools in the zone. The instrument used for data collection included Geography achievement test and Geography interest scale developed by the researcher. The GAT and GIS was validated by three experts, two from Geography and Environmental Education unit and one from Measurement and Evaluation Unit all from University of Nigeria Nsukka. The reliability estimate of the GAT was established using Kuder-Richardson (KR20). The reliability coefficient Index obtained was 0.81. Also, internal consistency estimate for the GIS was done using Cronbach Alpha and Correlational Coefficient index obtained was 0.72. Data generated from the pre-tests and post-test were analyzed using mean and standard deviation in answering the research questions while ANCOVA was used to test the null hypotheses at 0.05 level of significance. The study found that multiple intelligence approach is effective in increasing students' interest and achievement in EE contents in senior secondary school Geography in Nsukka Education Zone. Based on these findings, the study recommended that teachers should adopt multiple intelligence approach in teaching Environmental Education contents in senior secondary school Geography classroom.

Keywords: Multiple Intelligence, Environmental Education, Geography, Interest, Achievement**Introduction**

Geography occupies a central place in the school curriculum because of its relevance to daily life and national development. As Medina et al. (2023) observed, geography deals with the spatial distribution of phenomena on the earth's surface and the interaction between man and his environment. Madu (2016) further described it as a science of spatial relationships that focuses on how human beings relate with their surroundings. Through the study of geography, learners develop sound judgement, reflective thinking, accurate measurement, and observational skills that prepare them to function effectively in a rapidly changing world (Sura, 2023). Geography is also closely linked to environmental education. Both disciplines

share the goal of building awareness about the environment and equipping learners with the knowledge, values, and skills needed to protect it. The National Educational Research and Development Council (NERDC, 2017) has recognised this connection by infusing environmental themes such as pollution, global warming, climate change, and environmental hazards into the senior secondary school geography curriculum in Nigeria.

Despite the pivotal role of geography in equipping students with knowledge, skills, sound judgement, reflective thinking, and accurate measurement for functionality in a rapidly changing world, the performance of Nigerian secondary school students in the subject has remained a matter of serious concern for many years (Obasi, 2018). Evidence from the West African Senior School Certificate Examination (WASSCE) chief examiners' reports spanning 2019 to 2023 reveals a consistent decline in candidates' performance, with identified weaknesses in map work, computational skills, explanation of points, Koppen climatic classification, and environmental problems. This trend is not new, as earlier studies by Akintade (2012), Aderogba (2012), Amosun (2016), Filgona, Sababa and Filgona (2016), Folade et al. (2016), and Etim, Udosen and Ema (2016) had all documented the unsatisfactory and discouraging performance of Nigerian students in geography, attributing it to a range of factors including inadequacy of facilities and instructional materials, inefficient time allocation, non-student-centred programmes, poor teaching environments, teacher demotivation, students' difficulty with geographical concepts, overemphasis on theoretical rather than experiential approaches, and misconceptions about certain topics, ultimately pointing to the critical link between student outcomes and the quality of instructional strategies adopted by teachers in the classroom (Benjamin, 2014). A growing body of evidence suggests that schools can make a great difference in terms of students' academic performance and a substantial portion of that difference is attributable to teachers (RAND Corporation, 2012).

Research has shown that students do not enter the classroom as a blank slate (Noshadi, 2025). Learners construct knowledge by making connections between new information and their existing conceptual framework (Piaget, 1964). Ruiz-Martín and Bybee, (2022) further noted that students' prior conceptions and experiences influence how they learn new concepts and skills. This means that teachers must employ diverse instructional approaches that match the varied learning capacities of students. Nkrumah et al. (2026) observed that geography teachers have traditionally relied heavily on the lecture method, which is largely teacher-centred and does not adequately engage the diverse learners in a typical classroom. There is therefore a need for a shift towards learner-centred strategies that promote active participation and deeper understanding.

One such strategy is the multiple intelligences approach, grounded in the theory proposed by Gardner (1983). Gardner identified seven distinct intelligences, namely linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, and intrapersonal. He later added naturalistic and existential intelligences (Fernández Alba et al., 2019). The theory holds that individuals possess these intelligences in varying degrees and that teaching which activates multiple intelligences produces more meaningful learning outcomes. Pearson et al. (2015) emphasised that instruction based on multiple intelligences offers innovative ways for students to demonstrate their intellectual strengths. Xu et al. (2024) affirmed that because students learn in different ways based on their distinct blend of intelligences, teachers who adopt multiple intelligence approaches are better positioned to engage all learners effectively. In this study, the researchers focused on four intelligences, namely logical-mathematical, spatial, interpersonal, intrapersonal, and naturalistic intelligences, because of their particular relevance to the understanding of environmental education contents in geography.

Several studies have examined the use of the multiple intelligences approach at various levels of education. Luo and Huang (2019) found that teachers who used linguistic, interpersonal, and intrapersonal intelligences frequently in English language teaching recorded improved student engagement. (Yidana et al., 2022) reported that science and economics teachers who applied multiple intelligence strategies promoted better participation among students. In Nigeria, Asaije et al. (2022) found a significant difference

in Biology students' achievement and interest in favour of the multiple intelligence strategy over lecture method. Despite this evidence, few studies have examined the effect of the multiple intelligences approach specifically on Environmental Education contents in Geography at the senior secondary school level in Nigeria, and none has been conducted in Nsukka Education Zone. This gap informs the present study. The study therefore investigated the effect of the multiple intelligence teacher approach on students' interest and academic achievement in Environmental Education contents in Geography in senior secondary schools in Nsukka Education Zone, Enugu State, Nigeria. It also examined whether the interaction of the approach with gender had any significant effect on students' interest and achievement. The following research questions guided the study.

1. What is the difference in mean interest rating of students taught using Multiple Intelligence approach mix and those taught using lecture method?
2. What is the interaction effect of Multiple Intelligence approach mix and gender on student's interest rating in EE contents in Geography?
3. What is the difference in mean achievement scores of students taught EE contents in Geography using Multiple Intelligence approach mix and those taught using lecture method?
4. What is the interaction effect of Multiple Intelligence approach mix and gender on students mean academic achievement scores in EE contents in Geography?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

- Ho1: There is no significant difference in the mean interest rating of students taught using Multiple Intelligence mix and those taught using lecture methods.
- Ho2: There is no significant interaction effect of Multiple Intelligence approach and gender on students' interest rating in EE contents in Geography.
- Ho3: There is no significant differences in the mean academic achievement scores of students taught using Multiple Intelligence mix and those taught using lecture methods.
- Ho4: There is no significant Interaction effects of Multiple Intelligence approach and gender on students' achievement in EE contents in Geography.

Methodology

The study adopted quasi-experimental research design specifically, a non-equivalent pretest, posttest control group design. According to Nworgu (2017) quasi-experimental design is a design in which random assignment of subjects to experimental and control group is not possible. In this case intact classes were used. The population of the study consists of 1552 senior secondary Two (SS2) students offering Geography in the 59 public secondary schools in Nsukka Education zone of Enugu State. The sample size for the study was 108 (48 males and 60 females) students in two SS2 intact classes drawn from two co-educational public secondary schools in the zone. A multi-stage sampling technique was adopted; Simple random and purposive sampling were used. Simple random sampling techniques were used to select the two co-educational schools and purposive sampling was used to select students offering Geography in the two public secondary schools. One of the schools served as the experimental group while the other one served as the control. The instruments used for data collection included Geography Achievement Test and Geography Interest Scale developed by the researcher. The GAT had 20 multiple choice items with three response options A, B, C, D and E. The questions were scored 1 mark each for each correct answer and 0 otherwise. The GIS had 30 items structured in a four-point Likert scale format Strongly Agree (SA) 4 Agree (A) 3 Disagree (D) 2 and Strongly Disagree (SD) 1.

The GAT and GIS were validated by three experts, two from Geography and Environmental studies unit and one from Measurement and Evaluation Unit all from University of Nigeria Nsukka. The reliability estimate of the GAT was established using Kuder-Richardson (KR20). The reliability coefficient Index obtained was 0.81. Also, internal consistency estimate for the GIS was done using Cronbach Alpha and index obtained was 0.72. Data generated from the pre-tests and post-test were analyzed using mean and standard deviation in answering the research questions while ANCOVA was used to test the null hypotheses at 0.05 level of significance.

Research Procedure

The research was carried out in Nsukka Education Zone during the first term 2024/2025 academic year. The experimental group was composed of 58 students attending SS2 and control group was composed of 50 attending SS2, thus, the research was conducted with 108 students offering Geography in Nsukka Education zone. Model secondary School Nsukka was assigned to the experimental group and taught using Multiple Intelligent Approach. While Community secondary school Isienu Nsukka was assigned to the control group were taught using traditional method or lecture method. Students were examined individually for one week after the expiration of the seven-week period of the experimental study. No permission was given for the students to help each other in the exams and the students were made to sit separately on their desks. Before the commencement of the experiment or treatment, a four-day training programme was organized by the researcher to train the regular Geography teachers who were drawn from the sampled schools as research assistants. The teachers were given the validated lesson plans which guided the research assistants during the experimental teaching. They were specifically trained on how to fully implement the distinct steps of the Multiple Intelligences profiles in the classroom. The training lasted for seven weeks using their regular Geography periods on their time tables. Each class lasted for a period of 40 minutes. However, before the commencement of the main experiment, subjects were profiled according to their Intelligences using Gardner's Multiple Intelligences Inventory Pearson et al. (2015). Then GAT and GIS were administered as pretests to the subjects by the registered teachers in both groups. The essence of pretesting was basically to enable the researcher to gather the baseline data which served as covariates to students' final test scores in this study. At the end of the seven weeks of treatment, post-test was administered for both the experimental and control group a week after the last class was held. Test items for the post tests are the same as the pre-tests except that the questions are reshuffled.

Results

Research Question 1: What is the difference in mean interest rating of students taught using Multiple Intelligence approach mix and those taught using lecture method?

Table 1: Mean and standard deviation analysis of interest ratings of students taught using Multiple Intelligence approach mix and those taught using lecture method

Groups	N	Pre-test		Post-test		Mean Gain Scores	Mean Gain Difference
		Mean	SD	Mean	SD		
Experimental	58	2.55	0.39	2.66	0.44	0.11	0.04
Control	50	2.56	0.39	2.63	0.36	0.07	

Result in Table 1 shows the mean interest rating of students taught using Multiple Intelligence approach mix and those taught using lecture method as control. Students exposed to multiple intelligence approach had mean interest ratings of 2.55 at pre-test and 2.66 at post-test. The mean gain rating of students exposed to multiple intelligence approach was 0.11. On the other hand, the control group had mean interest ratings of 2.56 at pre-test and 2.63 at post-test. The mean gain ratings of the control group was 0.07. The mean gain difference of 0.04 was recorded for the two groups in favour of the students exposed to multiple intelligence approach.

Hypothesis 1: There is no significant difference in the mean interest rating of students taught using Multiple Intelligence mix and those taught using lecture method as control

Table 2: Summary of the 2-Way Analysis of Covariance (ANCOVA) on the difference in the mean interest rating of students taught using Multiple Intelligence mix and those taught using lecture method as control

Source	Type III Squares	Sum of df	Mean Square	F	Sig.
Corrected Model	.666 ^a	4	.166	.998	.412
Intercept	15.431	1	15.431	92.550	.000
PreINT	.053	1	.053	.316	.575
GD	.010	1	.010	.058	.810
Strategy	.007	1	.007	.044	.834
GD * Strategy	.507	1	.507	3.042	.084
Error	17.173	103	.167		
Total	777.860	108			
Corrected Total	17.839	107			

Result of the analysis in Table 2 revealed that the multiple intelligence approach had no significant effect on the mean interest ratings of secondary school students in Geography. This is because the calculated F-value of 0.044 associated with the strategies has a probability value of .834 and therefore is not significant at 0.05 level of significance. This implies that exposing secondary school students to multiple intelligence approach did not significantly increase their interest in Geography. Therefore, the null hypothesis of no significant difference in the mean interest rating of students taught using multiple intelligence mix and those taught using lecture method as control is retained.

Research Question 2: What is the interaction effect of multiple intelligence approach mix and gender on students' interest rating in EE contents in Geography?

Table 3: Mean and standard deviation analysis of the interaction effect of Multiple Intelligence approach mix and gender on students' interest rating in EE contents in Geography

Groups	Gender	Pre-test			Post-test		Mean Difference
		N	Mean	SD	Mean	SD	
Experimental	Male	35	2.54	0.41	2.58	0.37	0.04
	Female	23	2.58	0.37	2.77	0.56	0.19
Control	Male	13	2.61	0.35	2.73	0.35	0.12
	Female	37	2.54	0.40	2.60	0.37	0.06

The result in Table 3 shows the interaction effect of multiple intelligence approach mix and gender on students' interest rating in EE contents in Geography. Result shows that the male students taught EE contents in Geography using multiple intelligence approach had mean interest ratings of 2.54 at the pre-test and 2.58 at post-test. The mean difference of 0.04 was recorded. The female students taught EE contents in Geography using multiple intelligence approach had mean interest ratings of 2.58 at pre-test and 2.77 at post-test. The mean difference of 0.19 was recorded. The result on Table 3 also shows that the male students taught EE contents in Geography in the control group had mean interest ratings of 2.61 at pre-test and 2.73 at post-test. The mean difference of 0.12 was recorded. The female students taught EE contents in Geography in the control group had mean interest ratings of 2.54 at pre-test and 2.60 at post-test. The mean difference of 0.06 was recorded. Result shows that the female students had slightly higher interest ratings in EE contents in Geography than the male students when taught with multiple intelligence approach. In other words, the result appears to have shown an interaction effect of multiple intelligence approach and

gender on students' interest in EE contents in senior secondary school Geography. This prompted further analysis of the interaction effect using inferential statistic to confirm is the interaction effect is significant or not.

Hypothesis 2: There is no significant interaction effect of Multiple Intelligence approach and gender on students' interest rating in EE contents in Geography

The result in Table 2 shows F-ratio of 3.042 significant at $p=0.084$ obtained for the interaction effect of multiple intelligence approach and gender on students' interest rating in EE contents in Geography. Since the associated probability value of 0.08 is greater than the threshold of 0.05 set as the level of significance, the null hypothesis, which states that there is no significant interaction effect of multiple intelligence approach and gender on students' interest rating in EE contents in Geography, is retained. Thus, the inference drawn is that the interaction effect of multiple intelligence approach and gender on students' interest ratings in EE contents in senior secondary school Geography is not statistically significant.

Research Question 3: What is the difference in mean achievement scores of students taught EE contents in Geography using Multiple Intelligence approach mix and those taught using lecture method?

Table 4: Mean and standard deviation analysis of the achievement scores of students taught EE contents in Geography using Multiple Intelligence approach mix and those taught using lecture method

Groups	N	Pre-test		Post-test		Mean Gain Scores	Mean Gain Difference
		Mean	SD	Mean	SD		
Experimental	58	10.72	5.91	20.86	4.25	10.14	5.44
Control	50	11.04	5.74	15.74	5.43	4.70	

Result in Table 4 shows the mean achievement scores of students taught EE contents in Geography using multiple intelligence approach mix and those taught using lecture methods. Students exposed to multiple intelligence approach had mean achievement score of 10.72 at pre-test and 20.86 at post-test. The mean gain score of students exposed to multiple intelligence approach was 10.14. On the other hand, those in the control group had mean achievement score of 11.04 at pre-test and 15.74 at post-test. The mean gain scores of the control group was 4.70. The mean gain difference of 4.63 was recorded for the two groups in favour of the students exposed to multiple intelligence approach.

Hypothesis 3: There is no significant differences in the mean academic achievement scores of students taught using Multiple Intelligence mix and those taught using lecture methods

Table 5: Summary of the 2-Way Analysis of Covariance (ANCOVA) on the difference in the mean academic achievement scores of students taught using Multiple Intelligence mix and those taught using lecture methods

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	923.812 ^a	4	230.953	10.539	.000
Intercept	9074.011	1	9074.011	414.067	.000
PreGAT	106.281	1	106.281	4.850	.030
GD	48.649	1	48.649	2.220	.139
Strategy	781.363	1	781.363	35.655	.000
GD * Strategy	103.947	1	103.947	4.743	.032
Error	2257.179	103	21.914		
Total	40107.000	108			
Corrected Total	3180.991	107			

Result of the analysis in Table 5 revealed that multiple intelligence approach had significant effect on the mean achievement scores in EE contents in senior secondary school Geography. This is because the calculated F-value of 35.655 associated with the strategies has a probability value of .000 and therefore is significant at 0.05 level of significance. This implies that exposing secondary school students to multiple intelligence approach significantly increased their achievement scores in EE contents in senior secondary school Geography. Therefore, the null hypothesis of no significant differences in the mean academic achievement scores of students taught using Multiple Intelligence mix and those taught using lecture method is rejected. Therefore, the researcher concludes that there is a significant difference in the mean achievement scores of students taught EE contents in senior secondary school Geography using multiple intelligence approach.

Research Question 4: What is the interaction effect of Multiple Intelligence approach mix and gender on students mean academic achievement scores in EE contents in Geography?

Table 6: Mean and standard deviation analysis of the interaction effect of Multiple Intelligence approach mix and gender on students mean academic achievement scores in EE contents in Geography

Groups	Gender	N	Pre-test		Post-test		Mean Difference
			Mean	SD	Mean	SD	
Experimental	Male	35	11.34	5.46	21.02	3.73	9.68
	Female	23	9.78	6.55	20.60	5.01	10.82
Control	Male	13	10.07	5.88	13.23	3.74	3.16
	Female	37	11.37	5.74	16.62	5.69	5.25

The result in Table 6 shows the interaction effect of multiple intelligence approach mix and gender on students mean academic achievement scores in EE contents in Geography. Result shows that the male students taught EE contents in Geography using multiple intelligence approach had mean achievement score of 11.34 at the pre-test and 21.02 at post-test. The mean difference of 9.68 was recorded. The female students taught EE contents in Geography using multiple intelligence approach had mean achievement score of 9.78 at pre-test and 20.60 at post-test. The mean difference of 10.82 was recorded. The result on Table 6 also shows that the male students taught EE contents in Geography in the control group had mean achievement score of 10.07 at pre-test and 13.23 at post-test. The mean difference of 3.74 was recorded. The female students taught EE contents in Geography in the control group had mean achievement score of 11.37 at pre-test and 16.62 at post-test. The mean difference of 5.69 was recorded. Result shows that female students had slightly higher achievement scores in EE contents in Geography than the male students when taught with multiple intelligence approach. In other words, the result appears to have shown an interaction effect of multiple intelligence approach and gender on students' achievement in EE contents in senior secondary school Geography.

Hypothesis 4: There is no significant Interaction effects of Multiple Intelligence approach and gender on students' achievement in EE contents in Geography

The result in Table 4 shows that F-ratio of 4.743 is significant at $p=0.032$ obtained for the interaction effect of multiple intelligence approach and gender on students' achievement score in EE contents in Geography. Since the associated probability value of 0.03 is less than the threshold of 0.05 set as the level of significance, the null hypothesis, which states that there is no significant interaction effect of multiple intelligence approach and gender on students' achievement score in EE contents in Geography is rejected. Thus, the inference drawn is that the interaction effect of multiple intelligence approach and gender on students' achievement score in EE contents in Geography is statistically significant.

Discussion of Findings

The first finding showed that students exposed to the multiple intelligence approach had a slightly higher mean interest gain score (0.11) compared to those in the control group (0.07). However, this difference was not statistically significant at the 0.05 level. This outcome may be explained by the short duration of the intervention. Seven weeks may not have been long enough for a teaching method to cause a measurable shift in students' interest levels. Interest, as Kpolovie (2014) noted, is a relatively enduring predisposition, meaning it takes time to develop. A brief exposure to a new approach may improve momentary engagement without producing deep, lasting interest. Additionally, the students in the control group were taught by their regular classroom teachers who were familiar to them, and this familiarity may have sustained their interest at a comparable level. This finding aligns with Obimalume (2021), who reported that students taught Biology using a multiple intelligence-based approach had higher interest scores, but acknowledges that the effect of innovative approaches on interest may take time to manifest. The finding is, however, in contrast with Asaije et al. (2022), who found a significant difference in interest scores between students taught Biology with multiple intelligence strategy and those taught with lecture method. The difference in subject matter, duration of study and sample characteristics may account for this variation.

The second finding revealed that students taught Environmental Education contents in Geography using the multiple intelligence approach achieved significantly higher post-test scores than those taught using the lecture method. The mean gain score for the experimental group (10.14) was notably higher than that of the control group (4.70). This result is not surprising. The multiple intelligence approach gives students the opportunity to engage with content through several pathways that match their individual strengths, whether through spatial visualization, logical reasoning, interpersonal discussion or naturalistic observation. This variety of engagement deepens understanding and retention of geographical concepts. Gardner (1983) posited that every individual possesses a unique blend of intelligences, and teaching that activates these diverse intelligences helps students construct more meaningful knowledge. The conventional lecture method, in contrast, largely targets only the linguistic and logical-mathematical intelligences, leaving many students underserved. This finding agrees with Celen (2019), who reported that students in an experimental group taught using multiple intelligence theory recorded significantly higher achievement gains than those in the control group. It is also consistent with Gulsha and Halime (2018), who found that multiple intelligences theory had a more positive effect on student achievement compared to traditional methods. Similarly, Ali, et al. (2013) confirmed that students instructed through a teaching strategy based on multiple intelligences achieved higher scores than those taught through traditional instruction. Closer to home, Asaije et al. (2022) found a significant difference in achievement among Nigerian secondary school Biology students in favour of the multiple intelligence strategy.

The third finding showed that the interaction effect of multiple intelligence approach and gender on students' interest in Environmental Education contents in Geography was not statistically significant. While female students in the experimental group showed a slightly higher mean interest gain (0.19) than their male counterparts (0.04), this difference did not reach the threshold of significance. This suggests that the multiple intelligence approach did not favour one gender over the other in generating interest. This can be understood in the context of how the approach works. The multiple intelligence approach creates inclusive learning environments that attend to the diverse ways students learn, regardless of their gender. Since the approach draws on a range of intelligences that both males and females can access, it is expected that neither group would show a distinctly superior advantage in terms of interest. Vincent-Ruz and Schunn, (2018) emphasized that interest is shaped by internal motivational factors, and these factors are not necessarily determined by gender. This finding agrees with Okoli et al. (2015), who found no significant interaction effect of multiple intelligence-based instructional technique and gender on students' interest in difficult Biology concepts. It also aligns with studies in other science subjects in Nigeria that found teaching methods to be gender-neutral in their effect on students' interest (Asaije et al., 2022).

The fourth finding revealed that the interaction effect of multiple intelligence approach and gender on students' achievement in Environmental Education contents in Geography was statistically significant. Female students in the experimental group recorded a slightly higher mean achievement gain (10.82) than male students (9.68), while in the control group, females also outperformed males. This significant interaction effect suggests that the multiple intelligence approach did not benefit both genders equally; the nature of the instruction interacted with gender to produce different achievement outcomes. This pattern may be linked to the fact that some of the intelligences targeted by the approach, particularly interpersonal and intrapersonal intelligences, tend to be areas where female students naturally perform well. Research has shown that girls often demonstrate stronger interpersonal awareness and self-regulation, which are qualities that support performance in learner-centred instructional environments (Menevis & Ozad, 2014). This finding contrasts with Okoli et al. (2015) and Asaije et al. (2022), who found no significant interaction between multiple intelligence strategy and gender on achievement. It also contrasts with Osuafor (2021), who reported no interaction effect of experiential learning and gender on Biology achievement. However, it is consistent with the view of Sener and Cokcaliskan (2018), who found significant gender differences in certain intelligence types, which in turn may influence how differently males and females respond to multiple intelligence-based instruction in terms of academic output.

Conclusion

This study examined the effect of the multiple intelligence teaching approach on students' interest and achievement in Environmental Education contents in Geography in Nsukka Education Zone, Enugu State. The findings show that although the multiple intelligence approach did not produce a statistically significant difference in students' interest, it significantly improved their academic achievement compared to the conventional lecture method. Furthermore, while the interaction of the approach and gender had no significant effect on students' interest, it significantly interacted with gender to influence achievement, with female students showing a slightly higher gain. These outcomes collectively indicate that the multiple intelligence approach is a more effective instructional strategy for geography teaching than the lecture method, particularly in improving students' academic performance in Environmental Education contents.

Recommendations

Based on these findings, the study recommended that:

1. Geography teachers in secondary schools should adopt the multiple intelligence approach as a regular instructional strategy. The significant improvement in students' achievement recorded in this study demonstrates that the approach is more effective than the conventional lecture method in helping students understand Environmental Education contents in Geography.
2. The State Ministry of Education and school administrators should organize regular workshops and seminars to train Geography teachers on how to implement the multiple intelligence approach in the classroom. Many teachers are unfamiliar with the approach, and targeted training will help them use it effectively.
3. Curriculum planners and designers at the National Educational Research and Development Council (NERDC) should integrate the multiple intelligence approach into the Geography curriculum framework. Lesson materials and teacher guides should be developed to support its classroom implementation at the senior secondary school level.

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