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EFFECTS OF TWO VALUE CLARIFICATION INSTRUCTIONAL STRATEGIES ON STUDENTS' ACADEMIC ACHIEVEMENT IN ENVIRONMENTAL EDUCATION CONTENTS IN SECONDARY SCHOOL GEOGRAPHY IN NASARAWA STATE

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Abstract
The study examined the effects of two modes of value clarification on students' academic achievement in Environmental Education contents of senior secondary school Geography. Five specific purposes, research questions and hypotheses guided the study. A quasi-experimental 2x2 factorial design was adopted and conducted in Nasarawa State, North-Central Nigeria. The population comprised 12,781 SSII Geography students for the 2023/2024 session, while 160 students (71 males, 89 females; 96 urban, 64 rural) formed the sample drawn from four intact classes in four schools using multi-stage sampling. The Environmental Education Content Achievement Test (EECAT) developed by the researchers served as the instrument for data collection. The instrument was validated by three experts from the University of Nigeria, Nsukka, and its reliability using Kuder-Richardson 20 yielded 0.83. Pre-test and post-test were administered using Moral Dilemma and Exploring Feelings instructional strategy lesson plans. Data collected were analyzed using mean, standard deviation, and Analysis of Covariance (ANCOVA) at 0.05 level of significance. Results showed that both moral dilemma and exploring feelings modes of value clarification significantly improved students' achievement in Environmental Education contents. Findings also revealed that urban students had higher post-test mean achievement scores than rural students, although the difference was not significant. The study concluded that the effective use of moral dilemma and exploring feelings modes of value clarification in teaching Environmental Education contents of senior secondary school Geography enhances students' academic achievement and supports the attainment of curriculum goals for national development.

Keywords: Environmental education, instructional strategies, students' academic achievement

Introduction

The place of Geography as a school subject cannot be toyed with by any nation that desire growth, development and sustainability. Geography as a discipline can help in no small way in building a vibrant nation that will not only meet the expectations of every citizens but also fulfill the dreams of the founding fathers – in an increasingly interconnected world. To know about the world and the happenings around will enable citizens to understand how remote events have the ability to impact people's lives all around the world. Moreover, Geography connects physical systems, cultural characteristics, evolution and modification of environments and availability and distribution of resources (Falade & Falade, 2023). Geography is the study of places and the relationships between people and their environments. Geographers explore both the physical properties of the earth's surface, societies and activities that spread across it. They also examine how many cultures interact with the natural environment and the way, locations and places impact on people. Geography can be seen as an important science that nurtures national and universal culture and gives public officials and every informed citizen the ability to make

international comparisons and inferences (Collins, 2015). Geography helps man to recognize the spatial distributions at all scales, local and worldwide in order to understand the complex connectivity of people and places. It is in view of all these importance with specific role of Geography in communicating environmental education awareness led to the integration of environmental education contents into Geography curriculum (Davidson, 2016).

Environmental education is a process that allows individuals to explore environmental issues, engage in problem solving, and take action to improve the environment. It serves as a strategy for educating individuals about matters and issues that affect our immediate surroundings, aiming to enhance environmental awareness and promote a change in attitude towards the environment. This in turn arouses concern about the physical problems in our surroundings. According to Dincan (2019) environmental education refers to organized efforts to teach how the natural environment functions, more importantly how human beings can manage behavior and ecosystem sustainably. It serves as a means of communicating environmental consciousness and a mirror for cultivating a desirable attitude towards natural features while evaluating acceptable environmental behavior (Edgar, 2019). Sampson (2024) defined Environmental Education as a discipline that inculcate desirable environmental knowledge, attitude, skills and values to the learners to enable the learners interact and relate with their environment in a friendly manner. Environmental education is considered the foundation of a healthy human relationship with their environment. Therefore, environmental education is defined as means of enlightening the masses about the various environmental problems and the need for environmental sustainability. Its' relevance include rising awareness of issues affecting environment, driving action for improvement and sustainability. Imoke (2016) assert that the relevant of environmental education lies in imparting environmental knowledge, increasing awareness, fostering positive attitudes, behavior and skills towards the environment. To achieve these objectives, environmental education contents was infused into the Geography curriculum. Edgar (2019) suggested the use of value clarification strategies in teaching controversial and value-laden issues such as environmental problems. Value clarification is aimed to engross scholars and instructors in the dynamic formulation and examination of principles. Value clarification instructional strategies (VCIS) is concerned with the process of valuing (attempts to teach children and adults to think through issues and provide a clear path to help individuals develop their own value systems through the process of thinking through the many problems and issues that confront an individual today). In line with this, Nwaubani (2016) states that to make an intelligent decision, students as social actors must have knowledge, must be able to identify and clarify their values and relate them to the knowledge they have already derived.

The value clarification instructional strategies which were adopted in the present study are Moral Dilemma and Exploring Feelings. Moral Dilemma is a value clarification instructional strategy in which an individual has the option of choosing amongst two or more activities backed up with ethical reasons for doing so based on what the society considers right. It is a description of actual life situations in which there is a judgement to be made or a problem to be solved. This instructional strategy was developed by Galbraith and Jones in 1975. It is basically aimed at resolving moral dilemma or issues and it is based on Lawrence Kohlberg's theory of Moral Development. The reason for choice of Moral Dilemma Instructional Strategy (MDIS) is that learner today is faced with more character development challenges than ever before. Then, responding successfully to these

challenges requires learners to have solid reasoning and decision- making. Moral dilemma could help students of all ages to develop skills, confidence and ability to make the best, right or good choices when faced with their own daily values and dilemmas. Students are put into small groups and are asked to come to a consensus in making a decision or finding a solution to issues affecting them. It is based on this awareness that students develop the ability of moral reasoning and progress more quickly to advanced levels by acting out their reasoning skills and by hearing moral reasoning of other students.

The second instructional strategy is Exploring Feelings which was popularized by Frankel in 1973. This strategy helps to discover the feelings and emotions of students. The strategy makes the learners to understand that values are aided by feeling and empathy with others who are faced with two or more undesirable and conflicting value alternatives. It is learning about emotions which help the students to recognize connections between thinking and feelings as well as interpersonal relationships. Exploring feelings is highly affective and also student-centered. This means that students are expected to undertake majority of the activities in resolving feelings. One does not value something that he /she does not like very much. There is a considerable amount of feeling involved in valuing. Therefore, exploring feelings presents students with the opportunity to figure out by themselves value positions to uphold. In other words, students analyze, choose value they desire to uphold based on their feelings on conflicting values. It uses materials such as value sheets i.e. thought provoking statements, questions or stories that have value implications.

Moral dilemma and exploring feelings value clarification instructional strategies could apply to both the cognitive and affective domains of learning. This is because moral dilemma is largely cognitive oriented while exploring feelings is affective. Similarly, both instructional strategies are capable of inspiring spirit of curiosity and inquiry in students. These attributes expectedly can promote or enrich students' achievement in environmental education contents in Geography curriculum. Academic achievement means learning outcomes relating to knowledge attained from a teaching process. It can also be termed as scholarly related progress of students which is the outcomes of all learning experiences that students have in a programme of education whose purpose is to attain aims and related specific objectives (Nwagbo, 2013). Achievement is an essential academic learning outcome that could be influenced by instructional strategies. Achievement is the accomplishment of a goal (Opara, 2021). It refers to the actualization of set goals or objectives. Academic achievement denotes to the completion of educational goals, the learning outcomes of students or the degree to which a student, an instructor or a tutor has achieved the stated learning objectives. Without strong efforts no goal or objective will be achieved. Hence, the teachers' desire and effort towards effecting positive behaviours in the learners lead to effective accomplishment of the objectives in the learner. Thus, there is need for Geography teachers to put in more effort towards effective classroom instruction as to achieve environmental education goals at the senior secondary school level which centers on values and production of functional citizens with good character formation. The present study tried to find out if the use of MDIS and EFIS value clarification instructional strategies could enhance students' academic achievement in environmental education contents in Geography curriculum notwithstanding the students' gender. Gender encompasses all the characteristics of males and females that a particular society has determined and assigned to each sex. It is the irreconcilable variance of roles culturally imposed on the sexes, encompassing those features and characteristics that make

the opposite sex differ in appearance Ikwunna (2016). Based on this study, gender is seen as a specific sex identity of human beings with different characteristics.

Studies have shown that there is still a persistent decline in the number of students studying Geography, as well as the registration of Geography by students in national examinations, and also poor achievement of those who register for the national examinations especially in Nasarawa state. This unpleasant situation has been attributed to teaching strategies used by teachers to explain Geography content. Considering the relevance of Geography, there is a need to conduct more studies on computer simulation teaching strategy. Since studies have proven value clarification teaching strategy to be more effective in many subjects; there is a need to conduct more research on moral dilemma and exploring feeling value clarification instructional strategies to determine their effectiveness in students' achievement and interest in environmental education contents in Geography, as well as to determine gender differences when two modes of value clarification instructional strategies are used to teach environmental education contents in Geography. However, to the best knowledge of the researcher study on value clarification instructional strategies has been carried out in the present study location. Thus, there was a need to carry out a study on the effects of two modes (moral dilemma and exploring feelings) of value clarification instructional strategies on students' achievement in selected environmental education contents in Geography.

Research Questions

The following research questions guided the study.

1. What is the difference in the mean achievement scores of students taught Environmental Education contents in Geography using moral dilemma and those taught using exploring feelings?
2. What is the difference in the mean achievement scores of male and female students taught Environmental Education contents in Geography using moral dilemma and exploring feeling value clarification instructional strategy?
3. What is the interaction effect of gender and value clarification instructional strategies on the achievement scores of students in Environmental Education contents in Geography?

Hypotheses

The following null hypotheses were tested at .05 level of significance.

$H0_1$: There is no significant difference in the mean achievement scores of students taught Environmental Education contents in Geography using moral dilemma and those taught using exploring feelings.

$H0_2$: There is no significant difference in the mean achievement scores of male and female students taught Environmental Education contents in Geography using moral dilemma and exploring feeling value clarification instructional strategies.

$H0_3$: There is no significant interaction effect of gender and value clarification instructional strategies on the achievement scores of students in Environmental Education contents in Geography.

Methods

The study adopted a quasi- experimental research design. Specifically, the non-equivalent control group research design was adopted. Nworgu (2015) viewed quasi-experiment as an experiment where random assignment of subjects to experimental and control groups is not possible. But rather, intact classes or pre-existing groups which are not equivalent will

be used as experimental and control groups respectively. This study was conducted in Nasarawa State, Nigeria. Nasarawa State is located in the North Central Geo-Political Zone, Nigeria. The choice of Nasarawa State as the area of study is anchored on the fact that the state has been experiencing different kinds of environmental problems like flooding, pollution among others even though environmental education contents are taught through the instrumentality of Geography curriculum. Besides, poor environmental attitude of people who passed through Geography, the reoccurring poor performance in Geography in the area was worrisome. The population of the study comprised 12,781 senior Secondary two (SS2) students in Nasarawa State. The state has one hundred and thirty-six (136) public secondary schools. These schools have population of twelve thousand seven hundred and eighty-one (12,781) for the SS2 students. The boys are 9,564 in number while the girls are 3,217. Furthermore, 7,152 of the population are in urban schools while 5,629 are in rural schools (Ministry of Education, Lafia, 2023). The choice of SS2 students was anchored on the fact that SS2 class was the middle arm of the senior secondary level classes. Therefore, they are no longer adjusting to senior secondary school curriculum like the SS1 students or preparing for serious examination like the SS3 students. Besides, the SS2 curriculum contents contain the environmental education contents the researcher worked on. The sample for the study was 160 SS2 students. The one hundred sixty (160) students comprised 71 males and 89 females while 96 students are in the urban areas and 64 students are in the rural areas. The sample size was drawn using multi-stage sampling technique. At first, stratified sampling technique was used to select 4 out of 13 LGAs. Purposive sampling technique was used to select four mixed schools. Simple random sampling technique was used to randomly assigned two intact classes (80 students) to experimental group 1 (moral dilemma) and two intact classes (80 students) to experimental group 2 (exploring feelings).

Two instruments were used for data collection. The instruments are Environmental Education Content Achievement Test (EECAT) and Environmental Education Content Interest Inventory (EECII). The two instruments were developed by the researchers. The EECAT comprised 50 multiple choice items with four options, while the EECII items were 52 and all of them were compiled by the researcher. The 50 items were developed by the researcher based on the curriculum contents of the SS2 Geography dealing on renewable and non-renewable resources, environmental problems and environmental conservation. These topics were chosen because they involve environmental issues and can be effectively taught using value clarification instructional strategies (Moral Dilemma and Exploring Feelings). The instruments were face and content validated. Environmental Education Content Achievement Test (EECAT) and Environmental Education Content Interest Inventory (EECII) were validated by three experts, two from the Department of Social Science Education (Geography and Environmental Education unit) and one from the Department of Science Education (Measurement and Evaluation Unit), all from University of Nigeria, Nsukka. The two instruments were trial tested to determine their reliability. To achieve this, forty (40) copies of each of the instruments were administered on forty (40) students in two senior secondary schools in Obi Local Government area that was not involved in the study but share similar characteristics with the senior secondary schools that will be used for the study. Their responses to EECAT items were analyzed using Kuder-Richardson formula 20 (K – R 20). The results indicate a positive correlation coefficient of 0.83. The internal consistency of EECII was determined using Cronbach Alpha procedure and a reliability coefficient of 0.89 obtained.

The pre-test was administered to both the experimental group 1 and experimental group 2 before the commencement of treatment. The treatment for the study was Moral Dilemma instructional strategy lesson plans for experimental group 1 and Exploring Feelings instructional strategy lesson plans for experimental group 2. All the groups were taught the same contents covering renewable and non-renewable resources, environmental problems and environmental conservation. The experimental group 1 was taught three lessons using Moral Dilemma instructional strategy lesson plans (MDISLPs); while the experimental group 2 was taught the same three lessons using Exploring Feelings instructional strategy lesson plans (EFISLPs). Each lesson lasted for 35 minutes covering one lesson plan a week. At the end of the treatment (experiment), a post-test was conducted on the two groups (1 and 2) using the EECAT and EECII. Data was collected from the four intact classes using the EECAT and EECII. The research questions were answered using mean and standard deviation. The mean benchmark was 2.5. Thus, any positively skewed item in EECII that attracted a mean score below 2.5 was considered not an interest area to the student while positively skewed items that attracted mean score of 2.5 and above were considered an interest area to the student. The research hypotheses were tested using ANCOVA at 0.05 level of significant.

Results

Research Question One: What is the difference in the mean achievement scores of students taught Environmental Education contents in Geography using moral dilemma and those taught using exploring feelings?

Table 1: Mean and standard deviation of achievement scores of students taught Environmental Education contents in Geography using moral dilemma and those taught using exploring feelings

Method	Pre-Test			Post-Test		
	N	$\bar{x}$	SD	$\bar{x}$	SD	Mean Difference
Moral Dilemma (MD)	80	48.64	14.84	55.43	16.41	6.78
Exploring Feelings (EF)	80	47.31	16.98	52.88	15.26	5.57

Table 1 shows the mean achievement scores of students taught Environmental Education using moral dilemma and those taught using exploring feelings. The result shows that students exposed to moral dilemma method had a mean achievement scores of 48.64 for pre-test (n = 53, $\bar{x}$ = 48.64, SD = 14.84) and post-test score of 55.43 (n = 53, $\bar{x}$ = 55.54, SD = 16.41) with mean difference of 6.78. The result also showed that students exposed to exploring feelings method had a mean scores of 47.31 (n = 49, $\bar{x}$ = 47.31, SD = 16.98) for pre-test and 52.88 (n = 49, $\bar{x}$ = 52.88, SD = 15.26) for post-test score with a mean difference of 5.57. This result implies that both moral dilemma and exploring feelings methods are potent in improving the achievement of students in Environmental Education. However, moral dilemma method is more efficient in improving students' achievement in Environmental Education when compared to exploring feelings method.

$H0_1$: There is no significant difference in the mean achievement scores of students taught Environmental Education contents in Geography using moral dilemma and those taught using exploring feelings.

Table 2: ANCOVA of the significant difference in the mean achievement scores of students taught Environmental Education contents in Geography using moral dilemma and those taught using exploring feelings

Tests of Between-Subjects Effects

Dependent Variable: Post interest

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	13404.972[a]	8	1675.622	13.030	.000	.528	104.239	1.000
Intercept	10008.283	1	10008.283	77.826	.000	.456	77.826	1.000
Preachiev	401.597	1	401.597	3.123	.080	.032	3.123	.417
	1310.135	1	1310.135	10.188	.002	.099	10.188	.885
Gender	3784.242	1	3784.242	29.427	.000	.240	29.427	1.000
Method	12.477	1	12.477	.097	.756	.001	.097	.061
* Gender	564.027	1	564.027	4.386	.039	.045	4.386	.545
* Method	2188.054	1	2188.054	17.015	.000	.155	17.015	.983
Gender * Method	133.627	1	133.627	1.039	.311	.011	1.039	.172
* Gender * Method	144.667	1	144.667	1.125	.292	.012	1.125	.183
Error	11959.704	151	128.599					
Total	325069.000	160						
Corrected Total	25364.676	158						

a. R Squared = .528 (Adjusted R Squared = .488)

b. Computed using alpha = .05

Table 2 shows the ANCOVA result for the significant difference in the mean achievement scores of students taught Environmental Education using moral dilemma and exploring feelings methods. The result shows that an F-ratio of .097obtained has an associated exact probability of 0.756. The exact probability value of 0.756 is greater than 0.05 level of significance. Hence, the null hypothesis which states that there is no significant difference in the mean achievement scores of students taught Environmental Education with moral dilemma and exploring feelings methods is accepted. The conclusion drawn is that, there is no significant difference in the mean achievement scores of students taught Environmental Education with moral dilemma and exploring feelings methods. Furthermore, table 4 shows a partial eta square ($_{\eta 2p)}$ of 0.001. This means that 0.1% of the increase in the mean achievement scores of students in Environmental Education was due to the effect of teaching methods.

Research Question Two: What is the difference in the mean achievement scores of male and female students taught Environmental Education contents in Geography?

Table 3: Mean and standard deviation of the achievement scores of male and female students taught Environmental Education contents in Geography

Gender	Pre-Test			Post-Test		
	N	x̄	SD	x̄	SD	Mean Difference
Male	71	58.12	17.553	65.68	13.512	7.56
Female	89	41.20	10.008	46.49	12.269	5.29

Table 3 shows the mean and standard deviation on the influence of gender on students` achievement in Environmental Education. The result shows that male students exposed to value clarification methods had a pre-test mean achievement score of (n=61, $\bar{X}$= 41.20, SD=10.008) and post-test (n=61, $\bar{X}$= 46.49, SD=12.269) with a mean difference of 5.29 while female students exposed to value clarification methods had a pre-test mean achievement score of (n=41, $\bar{X}$= 58.12, SD=17.553) and post-test (n= 41, $\bar{X}$= 65.68, SD=13.512) with a mean difference of 7.56. The result shows that the mean achievement score of female students taught Environmental Education using value clarification methods is higher compared to that of the male students who were exposed to the same value clarification methods.

$H0_2$: There is no significant difference in the mean achievement scores of male and female students taught Environmental Education contents in Geography.

The result presented in Table 2 on the significant difference in the mean achievement scores of students taught Environmental Education based on gender shows that the F-ratio of 29.427 obtained has an associated exact probability value of 0.000. Since the exact probability value of 0.000 obtained is less than 0.05 level of significance, the null hypothesis was rejected. Therefore, it is concluded that there is a significant difference in the mean achievement scores of students taught Environmental Education based on gender (male and female). Further analysis in Table 4 showed that the partial eta square (η2p) associated with gender is 0.240, indicating that 24% of the variance in the mean achievement scores of students taught Environmental Education was due to the influence of gender.

Research Question Three: What is the interaction effect of gender and value clarification instructional strategies on the achievement scores of students in Environmental Education contents in Geography?

Table 3: Mean and standard deviation of the interaction effect of gender and value clarification instructional strategies on the achievement scores of students in Environmental Education contents in Geography

Teaching Method	Gender	N	Post Achiev		Mean Difference
			x̄	SD	
MD	Female	41	66.42	14.28	20.08
	Male	39	46.34	12.01	
EF	Female	48	64.65	12.70	18.02
	Male	32	46.63	12.68	

The results in Table 3 show the interaction effect of method and gender on students' achievement in Environmental Education. The results show that female students gained more achievement (M = 66.42, SD = 14.28) than their male counterparts (M = 46.34, SD = 12.01) when taught Environmental Education using moral dilemma method with a mean difference of (M = 20.08). Similarly, female students had more achievement mean score in Environmental Education (M = 64.65, SD = 8.47) than their male counterparts (M = 46.63, SD = 12.68) when taught Environmental Education with exploring feelings with a mean difference of (M = 18.02). This implies that female students have more tendency of having greater academic achievement in Environmental Education when they are either taught with moral dilemma or exploring feelings method.

H0$_3$: There is no significant interaction effect of gender and value clarification instructional strategies on the achievement scores of students in Environmental Education contents in Geography.

The results in Table 2 show the ANCOVA of no significant interaction effect of gender and method on the mean achievement score of students in Environmental Education. This result show F (1, 93) = 1.039, p = .311 η_p^2 = .011. This value is greater than the probability value of .05 level of significance. Therefore, the null hypothesis is not rejected. Therefore, there is no significant interaction effect of gender and method on the mean achievement score of students in Environmental Education. This implies that students' gender does not matter in their achievement in Environmental Education when taught with any method. Although, the extent of the effect is small (effect size = .011).

Discussions

The findings of the study with respect to research question one with the corresponding research hypothesis one showed that moral dilemma method is more efficient in improving students' achievement in Environmental Education when compared to exploring feelings method and there is no significant difference in the mean achievement scores of students taught Environmental Education with moral dilemma and exploring feelings methods. The findings of this study are in line with findings of Bello (2011) who found values clarification effective in minimizing value conflicts among students. According to Oluwatimilehin, (2011) students engaged in academic value clarification as a group counseling technique obtained higher academic achievement compared to students not exposed to academic value clarification technique. It was also not coherent with Okafor (2019) who reported that Moral Dilemma was more efficacious in enhancing students' achievement in social studies than the exploring feelings and lecture method. Nonetheless, the findings of this study are not consistent with Obekpa (2022) who reported that exploring feelings value clarification strategy enhanced students' achievement much more than moral dilemma value clarification strategy.

The findings of the study with respect to research question two with the corresponding research hypothesis two showed that the mean achievement score of female students taught Environmental Education using value clarification modes is higher compared to that of the male students who were exposed to the same value clarification modes and there is a significant difference in the mean achievement scores of students taught Environmental Education based on gender (male and female). The findings of this study are coherent with Ejimonye (2015) who found out that female students in experimental group had higher mean achievement in Economics compared to their male counterparts. Ejimonye laying more credence to the findings of this study stated further

that there was a significant influence of gender on students' achievement in Economics in favour of the female students. However, the findings of the study do not lay credence to that of Okonkwo (2014) who reported that gender does not affect students' achievement when cooperative instructional strategy is used in teaching Government curriculum.

The findings of the study with respect to research question three with the corresponding research hypothesis three showed that female students have more tendency of having greater academic achievement in Environmental Education when they are either taught with moral dilemma or exploring feelings method and there is no significant interaction effect of gender and method on the mean achievement score of students in Environmental Education. These findings are consistent with Ejimonye (2015) who documented that male students in experimental group had higher mean achievement in Economics compared to their female counterparts. In the same manner, it is consistent with Fatokun and Omenesa (2015) who found out that interaction effect of treatment and gender on students' achievement is not significant. However, the findings of the present study disagree with that of Ejimonye (2015) which states that there was significant interaction effect of treatment and gender on students' achievement in Economics.

Conclusions

The study determined the efficacy of two modes of value clarifications on students' achievement in Environmental Education contents of senior secondary school Geography. The study was basically necessitated by the existing pedagogical and theoretical assumptions that Environmental Education contents of senior secondary school Geography when taught with appropriate instructional modes could help students develop value system that could foster environmental sustainability. It was also inferred that gender could influence students' achievement in Environmental Education contents of senior secondary school Geography. Consequently, from the discussion and findings of the study, it is clear that value clarifications instructional modes like moral dilemma and exploring feelings mode could promote students' achievement in Environmental Education contents of senior secondary school Geography. However, it was revealed that there was no significant difference in the mean achievement scores based on gender of students in Environmental Education contents of senior secondary school Geography. Basically, there were no significant interaction effects of instructional modes and gender on mean achievement scores of students in Environmental Education contents of senior secondary school Geography.

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