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## COMPARISON OF ENVIRONMENTAL ATTITUDES OF SCIENCE AND NON-SCIENCE UNDERGRADUATE STUDENTS OF SOKOTO STATE UNIVERSITY, NIGERIA

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### ABSTRACT

**Introduction:** The relationship between man and his surrounding is as old as his origin. All his basic needs of living are from his environment. Recently, the science and technological advancement of Man is resulting to several damages to environment which in turn affect the quality of air, water and climatic factors of the environment. Therefore, there is the need for more individuals with positive environmental attitudes.

**Purpose:** This study aimed to compare the environmental attitudes of science and non-science undergraduate students in Sokoto State, Nigeria. Three research questions and two hypotheses were answered and tested, respectively.

**Methodology:** Descriptive survey design was employed involving 322 science and non-science students. The instrument used for data collection is Environmental Attitude Inventory. Items of the instrument were adopted from Uzun, Gilbertson, Keles & Ratinen, (2019) and Milfont and Dukit (2010). The modified items were validated by experts and a reliability index of 0.66 was obtained after the pilot study. Data collected were analysed using descriptive statistics (frequency and percentage) and the Mann-Whitney U test.

**Results:** The findings of the study show that the majority of undergraduate students in Sokoto State University have a moderate environmental attitude and undergraduate science students demonstrated a higher environmental attitude than non-science students.

**Recommendations:** The study recommended that more training and workshops be organised for undergraduate students to improve their environmental attitude.

**Keywords:** Environmental Attitude, Science and Non-Science, Undergraduate



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## **PUBLIC INTEREST STATEMENT**

The goal of every research is to add to the existing knowledge, provide solutions to the existing problem and possible ways of preventing future occurrence. This study will surely add to the existing science education literature related to ecological literacy and consciousness. The outcome of this research is surely significant to all stakeholders in university education in Nigeria by discovering the level of environmental attitude of the undergraduate student in the study area. This research will also be useful to stakeholders involved in promoting ecological awareness and consciousness in Nigeria and beyond. It also may form a basis for other research in the area of ecological literacy and environmental education.

## **INTRODUCTION**

The attention of man to his surroundings has a long history. His survival depends on his understanding of the natural forces, the flora and fauna surrounding him. Knowledge of the environment and other living organisms within the human surrounding is vital to man and his survival. Man depends on the environment for food, shelter and essential materials. In doing so, man cut down valuable forests, brought about the extinction of plant and animal species and polluted the air, land, seas, rivers, and lakes. Consequently, it created severe conflict and threat to ecology (Gao, 2009). Understanding the existing complex relationship between man, environment and other living organisms is the major idea behind environmental studies. This resulted in the emergence of some environmental concepts such as Human Ecology, Industrial ecology, Animal ecology, ecological literacy, environmental attitude, ecological consciousness, ecological thinking, ecological democracy, etc. the National University Commission (NUC, 2016), have identified the development of the intellectual capacities of individuals to understand and appreciate their environments as one of the objectives of the University education in Nigeria. This is due to the recognition of the role of the university in improving the environmental consciousness and attitude among students. Furthermore, Elilam and Trop (2012) reported that school is one of the factors that influence the environmental attitude and behaviour of students. This study aimed at determining and comparing the environmental attitude of science and non-science university students.

The terms environmental and ecological are used interchangeably in

many publications. But Kaiser, Wolfing, and Fuhrer (1996) clarified that the former is related to attitude, while the latter is related to behaviour. Several environmental education studies have reported the importance of environmental attitude in predicting the ecological behaviour of a person, while others have explained that having a positive environmental attitude does not guarantee positive ecological behaviour (Tarfaoui & Zkim, 2017). But the general belief among environmental educators is that the environmental attitude has a significant influence on environmental behaviour. Consequently, it is important to investigate the level of environmental attitude of the undergraduate students with a view to finding out how they appreciate their environments which is also one of the objectives of the university education in Nigeria.

Attitude is one of the most researched variables in education. It refers to the psychological tendency of making decisions concerning the favourability of a particular issue, objects or situation (Geoffrey & Gregory, 2008). Therefore, attitude is the favourable and unfavourable evaluation of objects, events, issues, or anything in our surrounding. It is a multidimensional concept, therefore, the expression of one's attitude depends on his overall effective (feeling or emotions), cognitive (belief or thought) and behavioural (actions) evaluation or decision of an object (Veresova, 2016). Therefore, determining the attitude of individuals' members of society requires measuring their feelings, beliefs, and actions toward objects related to their surroundings. Environmental attitude is the belief of an individual or society with regard to

ecological issues (American Psychological Association Dictionary, 2023). Shultz et al. (2004) defined environmental attitude to belief and behavioural intentions of a person regarding environmentally related issues. Furthermore, Milfont, (2012) viewed environmental attitudes as “a psychological tendency to evaluate the natural environment, and factors affecting its quality, with some degree of favour or disfavour.” Both definitions relate environmental attitude with effective, cognitive, and behavioural favourability of a person on his environment or surroundings.

The literature on the level of environmental attitude of students is worrying. Gustria and Fauzi (2019) Analyses environmental attitudes of high school students’ in Sungai Penuh, Indonesia. The study findings show that most of the respondents (48,28%) have a low attitude, while some (34,48%) and (17,24%) have high and medium environmental attitudes. The study concluded that most of the students have a low environmental attitude. Rasha (2016) examined the attitudes and behaviour of Ajman University of Science and Technology (AUST) students toward the environment according to their gender and college. The study found undergraduate science students (environmental sciences, dentistry and pharmacy courses) have higher positive environmental attitudes than non-science students (Law, Mass Communication and Humanities colleges). Findings also showed that females have higher positive environmental attitudes than male.

Somashekara and Praveena (2021), compared the environmental attitude and behaviour of the postgraduate students of university of Mysore. Findings of the study revealed that the majority (60%) of Post graduate students possess a favourable environmental attitude while 14% and 26% of the Post graduate students possess less favourable highly favourable environment attitude respectively. The study also found no significant differences between the environmental attitude of the postgraduate students in Arts and Sciences. Ogunjimi and Oniya (2016) investigated the determinants factors of

environmental attitudes and behaviour of undergraduate students at the Federal University of Technology Akure, Nigeria. The study found a higher environmental attitude among the undergraduate students of the university. Furthermore, the study identifies the demographic attributes of the students such as age and gender as a determinant factor of environmental attitude among the undergraduate students.

### **STATEMENT OF THE PROBLEM**

Environmental issues and challenges such as pollution, drought, global warming, deforestation and erosion are common in Nigeria. Several literatures have identified human activities associated with technological advancement as the major factors behind these challenges. Taking into account the need to raise awareness and improve the attitude of people towards the environment, the federal government of Nigeria, through the National University Commission (NUC), made it compulsory for every undergraduate student to acquire the knowledge and skills needed to improve their environment. However, the science students acquire additional knowledge and skills through some courses of their academic programme. Conversely, the non-science students do not have that advantage. Hence the need to investigate and compare the level of environmental attitude of undergraduate science and non-science students.

### **PURPOSE OF THE STUDY**

The objectives of the study are to determine:

1. The level of environmental attitude of undergraduate students in Sokoto State University.
2. The difference between the level environmental attitude of science and non-science undergraduate students in Sokoto State University.
3. The difference between the level environmental attitude of male and female undergraduate students in Sokoto State University.

## **RESEARCH QUESTIONS**

1. What is the level of environmental attitude of undergraduate students in Sokoto State University?

## **HYPOTHESES**

1. There is no significant difference between the level environmental attitude of science and non-science undergraduate students in Sokoto State University
2. There is no significant difference between the level environmental attitude of male and female undergraduate students in Sokoto State University

## **METHODOLOGY**

### **Research Designs**

The research design employed in this study is a descriptive survey design. The design was preferred because the study only aimed at obtaining data to determine the status quo of the environmental attitude of science and non-science undergraduate students of Sokoto state university. The study did not manipulate any variable.

### **Population and Sample**

Sokoto State University is a conventional university with three faculties (Art and social science, education and science) and 23 academic programmes (12, sciences and 11 non-sciences). The study population comprises 2412 (300 and 400 level) students. The 100 and 200 level students are not considered in the study population because they did not receive any environmental related course at these levels.

The sample size for this study is 322. It was determined using a table of research advisors at 0.05 confidence level of 0.05. The sampling techniques used to select participants are proportionate and simple random sampling techniques. Proportionate sampling technique was used while determining the number of participants for each programme. To ensure fair and equivalent selection of the participant using proportionate sampling, population of students per programmes were identified before determining the ratio of students required from each

programme based on the sample size of the study. Furthermore, gender of the students was given fair considered. After identifying the number of participants required for each programme, a simple random sampling technique was used through paper folds. Therefore, samples were selected from each programme based on the ratio of the students per programme through paper folds.

### **Instrument for Data Collection**

The instrument used for data collection is a questionnaire titled Environmental Attitude Inventory (EAI). The instrument was developed to assess the level of environmental attitude of the respondent. It is divided into four sections. Section A sought the demographic information of the respondent, Sections B, C, and D comprise 20 items seeking for the belief, feeling, and intention or behaviour level of the respondent toward the environment and nature. It is based on a five-point Likert scale ranging from 1 (never or strongly disagree) to 4 (always or strongly agree). Most of the items in the inventory were adapted from Uzun, Gilbertson, Keles, & Ratinen, (2019) and Milfont and Dukit (2010).

Items used in the EAI have been validated in various studies such as Shamuganathan and Karpudewan (2015) and reported to be valid and reliable to measure environmental attitude. Despite this, the modified items were reviewed by other researchers and scholars in Biology, Biology education and environmentalist to ensure content validity. The reliability coefficient of the instrument was determined after a pilot study with 40 students from Usmanu Danfodiyo University, Sokoto using the Cronbach Alpha method to measure internal consistency, and the reliability index 0.66 was obtained.

### **Procedure of Data Collection**

Data were collected with the help of three research assistants; each was assigned with the responsibility of collecting data from participants of a Faculty. A venue was requested and granted by the leadership of each Faculty where participants assembled and the EAI

were administered. Areas and items of the instruments that required more explanations were cleared by a member of the research team responsible for the venue. Finally, all completed EAI issued to the participants were retrieved, no mortality was recorded because the whole exercise was well coordinated and controlled.

**Methods of Data Analysis**

The statistical tools used for data analysis are descriptive and inferential statistics. Descriptive statistics such as simple frequency and percentage, mean, and standard deviation were used to answer all research questions raised in this study. In doing so, the overall scores

obtained by each participant was added up and ranked as either having low (less than 50%), moderately (50% - 69%) or high (70% and above) environmental attitude. The inferential statistics employed for testing the two null hypothesis formulated in this study are the Mann-Whitney U test and at 0.05 level of significance of 0.05. The data analyses were carried out using Microsoft Excel 2016 and Statistical Package for Social Science (SPSS) software version 20.

**RESULTS**

**Research Question 1:** What is the level of environmental attitude of undergraduate students in Sokoto State University?

**Table 1: Summary of the Level of Environmental Attitude of Undergraduate Students**

<b>Level of Environmental Attitude</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Mean</b>	<b>Standard Deviation</b>
High	58	18.01%	74.38	3.91
Moderate	204	63.35%	60.29	4.76
Low	60	18.63%	44.42	4.16
TOTAL	322	100.00%		

Source: Field work 2022

The data in Table 1 shows a descriptive statistical summary of undergraduate students' level of environmental attitude. The table shows that 58 students amounting to 18.01% demonstrated a high-level environmental attitude. 204 students equivalent to 63.35% and 60 students (18.63%) have demonstrated moderate and low levels of environmental attitude. Furthermore, the table shows that students with high level of environmental attitude have a mean of 74.38 and standard deviation 3.91, those with moderate level have a mean of 60.29

and standard deviation 4.76, while students with low environmental attitude have a mean of 44.42 and standard deviation 4.16. Therefore, the data answered research question 1 that sought to determine the level of environmental attitude of undergraduate students at Sokoto State University.

**Hypothesis 1:** There is no significant difference between the level environmental attitude of science and non-science undergraduate students in Sokoto State University



**Table 2: Mann-Whitney U-Test Result of Students Environmental Attitude**

Group	N	Mean Rank	Median	Z-value	U-value	P-Value
Science Students	153	178.13	3.00			
				-3.69	10384.50	0.00
Non-Science Students	169	146.45	3.00			

Source: Field work (2022)  
 $\alpha = 0.05$

The statistical values in Table 2 show a summary of the results of the Mann-Whitney U test of students' environmental attitude between science and non-science students of Sokoto State University. The science students have higher mean rank 178.13 when compared with their non-science counterparts who have mean rank 146.45. Both (science and non-science) groups have a similar median score (3.0). This result answered research question 2 which sought for the difference between the level of environmental attitude of science and non-science undergraduate Students in Sokoto State University. Furthermore, the

results in the Table shows that the U-test and Z-test value are 10384.50 and -3.69 respectively, while the p- value (0.00) is less than alpha value (0.05). This revealed that there is a significant difference between the level of environmental attitude of science and non-science undergraduate students in Sokoto State University. Therefore,  $H_0$ 1 was rejected.

**Hypothesis 2:** There is no significant difference between the level environmental attitude of male and female undergraduate students in Sokoto State University

**Table 3: Mann-Whitney Test Result of Male and Female Students' Environmental Attitude**

Group	N	Mean Rank	Median	Z-value	U-value	P-value
Male Students	165	159.43	3.02			
				-.496	12610.50	.620
Female Students	157	163.69	3.00			

Source: Field work (2022)  
 $\alpha = 0.05$

The statistical results in Table 3 shows the summary of the result of the Mann-Whitney U test on environmental attitude between male and female undergraduate students in Sokoto State University. The data in the table revealed that female students have higher mean rank (163.69) and median 3.00, compared to their male counterparts who have mean rank 159.43 and median 3.02. This result answered research question three, which sought the difference between the level of environmental attitude of male and female undergraduate students in Sokoto State University. Furthermore, the results in the table shows that the U-test and Z-test value are 12610.50 and -0.496 respectively, while the p- value (0.620) is

higher than alpha value (0.05). This revealed that there is no significant difference between environmental attitudes of male and female undergraduate students in Sokoto State University. Thus,  $H_0$ 2 was retained.

### DISCUSSION

This study investigated the environmental attitude of science and non-science undergraduate students of Sokoto State University. It compared the level of environmental attitude of science and non-science students and male and female students. The three major findings of the study were discussed as follows:

### **Level of environmental attitude of undergraduate students in Sokoto State University**

The study indicated that the majority (63.35%) of undergraduate students in Sokoto State University have a moderate attitude towards the environment. However, some of the students have shown high and low environmental attitudes. This finding implies that the environmental attitude of the students is positive. Therefore, this finding supported Somashekara and Praveena (2021), whose study showed that majority (60%) of Post graduate students of university of Mysore, possess favourable environmental attitude while 14% and 26% of the Post graduate students possess less favourable highly favourable environment attitude respectively. Furthermore, this finding was supported by Ogunjimi and Oniya (2016), whose study found a higher environmental attitude among university undergraduate students. However, the finding also contradicts Gustria and Fauzi (2019) who found low environmental attitudes among high school students. Although the present study did not investigate the cause of having a moderate environmental attitude among students, it can be inferred and is related to the environmental training received by undergraduate students during their degree programme.

### **Level of Environmental Attitude of Science and Non-Science Undergraduate Students**

The study revealed that the Mann-Whitney test resulted from the environmental attitude of science and non-science students. It revealed that science students have a higher environmental attitude compared to the non-science students. Furthermore, the p-value obtained after the U-test indicated that the difference in the level of environmental attitudes between the two groups is statistically significant. This implies that undergraduate science students demonstrated a better environmental attitude than the non-science students. Therefore, it shows that discipline of students influences their environmental attitudes. This was

supported by Rasha (2016) whose study found that undergraduate science students have a higher positive environmental attitude than non-science students. However, the finding was in disagreement with Somashekara and Praveena (2021), who found no significant difference between environmental attitude of Arts(non-science) and Science postgraduate students.

### **Level of Environmental Attitude of Male and Female Undergraduate Students**

The study also showed the result of the Mann-Whitney test of the environmental attitude of undergraduate male and female students in Sokoto State University. It revealed that female students are ranked higher than their male counterparts. Furthermore, the p-value obtained after the U-test indicated that the difference in the level of environmental attitudes between the two groups of students is not statistically significant. This implies that the environmental attitude of male and female students is not significantly different. Therefore, gender does not have an effect on the environmental attitudes of students, which include their interest, behaviour, and emotion. This finding is contrary to Rasha (2016), whose study showed that female undergraduate students have higher positive environmental attitudes than their male counterparts. It also disagrees with Ogunjimi and Oniya (2016) who reported that gender is the determinant factor of environmental attitude among undergraduate students in Nigeria.

### **CONCLUSION**

Based on the data generated and analysed, the outcome of the study showed that majority of undergraduate students in Sokoto State University have demonstrated a moderate environmental attitude, this have indicated that the environmental education given to them in the course of the degree training is contributing towards development of individuals who understand and appreciate their environments. The findings also identified the study discipline as a factor that influences the

environmental attitude of the undergraduate students. Gender was not found to be factor determining the environmental attitudes of undergraduate students of the Sokoto State University.

#### RECOMMENDATIONS

1. Training and workshops should be organised for undergraduate students to improve their environmental attitude.
2. More policies and programmes aimed at Developing the environmental attitude and consciousness of the undergraduate should
3. Undergraduate students should be engaged in more activities aimed at protecting their environments.

**Conflicts of Interest:** The authors declare no conflict of interest.

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#### Disclaimer Statement

This work was extracted from the institution based research carried out by the authors.

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