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Biology Students Attitude toward Climate Change in North East Nigeria

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ABSTRACT

This research was undertaken to evaluate Biology students' attitude towards climate change in North East Nigeria. Cross sectional survey design was used. Three hundred and Ninety-Nine (399) respondents were sampled from a target population of One hundred and sixty-nine thousand, Eight hundred and Seventy-Nine (169,879) SS II students in North East Nigeria. The respondents were drawn through multistage sampling technique, which consisted of stratified, proportionate and simple random sampling. A questionnaire titled 'Biology students Climate Change Attitude Questionnaire (BSCCAQ)' was used to obtain responses from the respondents. Research question 1 was answered using Mean and Standard deviations and Hypothesis one and two were answered using independent sample t- test. The research findings showed that Attitude of Biology Students towards climate change was positive and that there was a significant difference between Male and Female Biology students in Attitude towards climate change in North East Nigeria with Female having more positive attitude than Male. The research also revealed a significant difference between urban and rural Biology students in North East Nigeria towards Climate Change attitude with Urban students having more positive attitude than Rural Students. Therefore, the study recommended that students should be encouraged to become climate ambassadors that would promote sustainable practices and inspiring others to act in the community. The study also recommended that there is need to develop educational material and programs that cater to the needs of both genders addressing any gender-based attitude gaps and that specific interventions be made to address attitude gaps between rural and urban students, ensuring equal opportunities for climate change education.

Keywords: Climate Change, Attitude, Biology students

INTRODUCTION

Since the industrial age, Humans have made significant advancements and progress, but these achievements have come with a price, resulting in various negative consequences which includes change in the state of the climate. The United Nations climate change advisory body (Intergovernmental Panel on Climate Change IPCC, 2021) articulates that "Climate change refers to a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties (e.g. temperature, precipitation, humidity, incident radiation, wind patterns), and that persists for an extended period, typically decades or longer. While the Earth's climate is naturally influenced by solar variations, ocean tides, volcanic eruption and orbital changes, changes in the climate over the last century are due primarily to human influences (Ugwu et. al, 2021). United State Global Change Research Program (USGCRP, 2017) stated that The Earth's average temperature has risen by 1.5 degrees Fahrenheit over the past century and is projected to rise up to 8.6 degrees Fahrenheit over the next 100 years. Small changes in the average temperature of the planet can translate to large and potentially dangerous shifts in climate and weather. This change in temperature is largely due to human activities, such as the burning of fossil fuels, industrial pollution, deforestation, land use changes, gas flaring, energy production, transportation, housing, Agricultural activities, unsustainable consumption patterns and population growth which leads to the emission of Greenhouse Gases.

Climate Change will continue to increase in its intensity, and there is a great risk to public health, global food security, economic development, and to the natural world on which much of humans' prosperity depends (Sulistyawati et al., 2018). Rahman et al. (2021) Stated that dimensions of natural disasters due to climate change such as flood, wildfires, excessive sunlight, heavy rains, heatwaves, clean water crises, earthquake, excessive wind, rising sea levels, drought, thunderstorms, melting of ice caps, tsunamis and so on are fast occurring and are placing citizens of various countries in serious danger.

An attitude describes persons' enduring favorable or unfavorable cognitive evaluations, feelings, and action tendencies toward some object or idea. It is the readiness to act in a certain way expressed by a person's words, gestures or facial expression (Yadav & Atrey, 2023). People have attitudes regarding almost everything such as religion, politics, cloth, music, food. A person's attitudes settle into a coherent pattern and to change one may require difficult adjustment. It is actually an acquired feeling. Attitude is the mixture of beliefs and feelings that people have about situations, specific ideas or other people. Attitude influence human behavior A positive attitude towards a thing will influence human behavior towards the thing favorably and vice-versa. Attitude is not inborn phenomenon but are learn through social interaction and experience.

Climate change attitude means the way of thinking and acting by individual towards the issue of global climate change. It is the feelings and concerns an individual could have regarding climate change. The main factors affecting public attitude about climate change are experience with extreme weather event, understanding of scientific information (climate change knowledge), media coverage of the issue, effort of advocacy group and cues from the political elites and economic factors (Ezeudu et. al, 2016).

Education serves as one of the social pillars that raise the younger generation's climate change attitude and contributes to bridging gaps in scientific and social comprehension of climate change (García et al., 2022). In Nigeria, the curriculum produced by Nigeria educational research and development council (NERDC, 2013) were infused with topics that are related to climate contents like our environment, physical environment, sanitation, pollution, natural and manmade environmental hazards, deforestation, population, effects of industrial concentration, composition of atmospheric gases, weather and climate, classification of climate and major climate types of the world in most secondary school subjects like Biology, Geography, Chemistry, Physics, Agriculture, and Social Studies. These contents and subjects are veritable means of promoting climate change attitude of secondary school students in Nigeria. In spite of the efforts, through school instructions to promote attitude towards environmental problems particularly climate change, it appears that the programme is not yielding the desired result (Udegbunam, 2021). As a result, the purpose of this study was to examine the attitude of Biology Students towards Climate Change in North East Nigeria.

In determining students' attitude towards climate change, considerations need to be taken on the influence of gender and location on students' climate change attitude. Ofori et al. (2023) noted that gender implies the character of being male or female, man or women, boy or girl. Male refers to a person who identifies as a man or boy, and is often associated with traditional masculine roles, behaviors and characteristics. Female refers to a person who identifies as woman or girl and is often associated with general feminine roles, behaviors and characteristics. The disparity between the male and female could influence their attitude towards climate change.

Location of individuals could also affect their attitude towards climate change. Udegbunam (2021) opined that location means a settlement whether a village, town or city usually by human beings. Location in the context of this study means a geographical place or area where somebody or something is situated. It could be rural or urban area. Rural areas are often made up of villages which may either be dispersed, nucleated or even linear in their pattern of distribution on the land, with few buildings and little number of people. It offers its settlers a simple and quiet life style. Their major economic activity is farming with few amenities and services centers. Urban areas are relatively large, dense and permanent settlement of socially heterogeneous individuals. Urban areas are large and heterogeneous population, with medical, educational, recreational, banking and social facilities, with highly developed manpower who engage in non-agricultural occupations. The above disparity between the urban and rural areas could influence their attitude towards climate change.

LITERATURE REVIEW

Falaye and Okwilagwe (2016) conducted a study to assess Senior School Students Attitude Related to Climate Change. The study adopted survey research and the research participants were 1,103 senior secondary school (SSII) students from Ibadan Metropolis. A questionnaire was employed to collect data. Descriptive and inferential statistics were used for data analyses. Findings indicated that attitude related to climate change is slightly favourable among students.

Ibrahim et al. (2018) applied a descriptive cross-sectional research design to assess Assiut University students' global warming attitude. A convenient sample of 1300 students from different faculties were included. Their study utilized a modified environmental issues questionnaire with a Likert scale. The study found that most of the students had a positive attitude towards global warming.

Udegbunam and Onyegegbu (2021) conducted a study to assess Attitude of Secondary School Biology Students on Climate Change Adaptation in Anambra State". Descriptive survey design was adopted for the study. Participants in the study comprises of 396 SSII Biology students. Instruments used for data collection was Attitude to Climate Change Adaptation Questionnaire (ACCQ). Findings showed that Biology students attitudes on climate change adaptation was low. The result also showed that differences were statistically insignificant in attitude of Biology students towards climate change adaptation by school location.

Chairunnisa et.al (2022) also conducted a study to assess the Attitudes of secondary school Students in Palembang Towards Climate Change Issues. The study employed a qualitative research approach and a total of 744 junior high school students participated in the study. The results showed that students' beliefs about the causes and impacts of climate change were 65.50%, and students' attitudes to mitigating climate change were 69.50%.

Salman et.al (2023) conducted a study to investigate Young Students Attitude towards Climate Change. Experimental research design was used. 38 out of 50 students from 10 universities participated in the pre-and post-KAP questionnaires. The research paper uses the KAP questionnaire to collect data from the participants. Google Forms are used to encode the KAP questionnaire in Arabic and English versions. Data was collected and analysed using an Excel spreadsheet and Statistical Package for the Social Sciences (SPSS) Version 26.0. The results show a positive Attitude towards climate change.

Wadson et.al (2023) carried out research to Examine Learners Attitudes Towards Learning Climate Change Education Content in Senior Secondary Schools. The mixed method convergent parallel design was employed. Data was collected from 64 participants consisting of learners in 8 secondary schools in two education divisions. Questionnaires and focus group discussions were used to collect data. Quantitative data was analysed using SPSS, while qualitative data was analysed thematically. Finding of their research revealed that 73.4 per cent agreed that learning CCE content makes them worried about the environment.

Aim and objective of the study

The objective of the study is to assess the Attitude of secondary school Biology students towards climate change in North East Nigeria. An understanding of the respondent's attitude towards climate change is important for governments and educational sectors to develop curriculum that will enhance climate change attitude. Furthermore, an idea of positive attitude among the future generation is important in improving disaster risk management and resiliency on the possible adverse effect of climate change.

Research question

What is the attitude of Secondary School Biology students towards Climate Change in North East Nigeria?

Hypothesis

HO_1: There is no significant difference between male and female Biology students' attitude towards climate change in North East Nigeria

HO_2: There is no significant difference between urban and rural Biology students' attitude towards climate change in North East Nigeria

METHODOLOGY

This study was carried out using cross sectional survey design. The area of the study is the North East zone of Nigeria which has six states namely Borno, Yobe, Adamawa, Bauchi Taraba and Gombe state. The population of the study was 415,008 Biology students in North East Nigeria. The target population for this study will comprise of One hundred and sixty-nine thousand, Eight hundred and Seventy-Nine (169,879) senior secondary school Biology students II (SS2) in the North East of Nigeria. The sample of the study was determined using sample size table given by research advisors (2006) which proposed that three hundred and Eighty-four (384) individuals and above are considered appropriate for a population from 100000 and above. Therefore, three hundred and ninety-nine (399) senior secondary school two (SSII) Biology students would be selected randomly and take part in the study. Proportionate random sampling was used to distribute the sample based on the number of students in SS II across the six states of the North East.

A Questionnaire titled 'Biology students Climate Change Attitude Questionnaire (BSCCAQ)' was Adapted for data collection (Wadson et al 2023, Salman et.al 2023, Chairunnisa et.al 2022, & Deshiana et.al, 2022). It is divided into two sections. Section A is on personal data of the respondent and section B comprise of 20 items, which the respondents answered using a five-point Likert scale of Strongly Agree (SA) 5 points, agree (A) 4 points, Undecided (U) 3 points, disagree (D) 2 points and Strongly Disagree (SD) 1 point. The researcher established internal consistency using Cronbach's Alpha (α) method. The reliability index of the instrument was 0.78 which was acceptable. Research question 1 was answered using descriptive statistics of Mean ($\bar{x}$) and Standard deviation (σ) and while Hypothesis 1 and 2 was answered using independent sample t-test at 0.05 level of significance. The Statistical Package for Social Science (SPSS) version 23.0 was used for the analyses. A mean score above 3.0 would be regarded as positive attitude, a mean score between 2.5-3.0 would be graded neutral and a mean score below 2.50 would be regarded as negative attitude.

RESULT

Research question: What is the attitude of Secondary School Biology students towards Climate Change in North East Nigeria?

Table 1 shows the Mean ($\bar{x}$) and standard deviation (σ) of Biology Students attitude towards climate change. The table shows that all the 20 items' mean scores are more than 3.0, an indication that Students attitudes towards Climate Change was positive with an average Mean ($\bar{x}$) and SD (σ) of 3.74 and 0.688 respectively. This revealed that secondary school Biology Students in North East Nigeria have positive attitude towards climate change.

Table 1: Mean and standard deviation (SD) of Biology Students attitude towards climate change in North East Nigeria

S/No	Statement	N	Mean ($\bar{x}$)	SD (σ)	Decision
1	I believe that climate change is real and should be treated seriously	399	3.90	1.269	Positive
2	I feel it is better to replace fossil fuel-based energy with renewable energy to reduce climate change	399	3.88	1.185	Positive
3	I feel that climate change threatens mankind and nature	399	3.76	1.113	Positive
4	I believe that the current climate change is occurring due to human activities	399	3.83	1.131	Positive
5	I would like to use solar energy to reduce greenhouse gas emissions	399	3.79	1.217	Positive
6	I am seriously concerned with the problem climate change may bring	399	3.66	1.254	Positive
7	I think that Recycling organic waste reduces greenhouse gasses emissions.	399	3.67	1.202	Positive

8	I feel that it is important that we protect our forest from deforestation	399	3.79	1.177	Positive
9	I do think that climate change affects the spread of epidemics and diseases**.**	399	3.75	1.241	Positive
10	I do not encourage cutting down trees	399	3.76	1.253	Positive
11	I believe that the heat is caused by climate change	399	3.76	1.262	Positive
12	I believe that emission of CO_2 by industries contributed much to climate change	399	3.75	1.278	Positive
13.	I do not believe in climate change	399	3.54	1.320	Positive
14.	I believe Climate change is over exaggerated	399	3.49	1.335	Positive
15.	I feel that climate change has a positive effect on the environment	399	3.68	1.282	Positive
16	I will be happy if the issue of Climate change is taken more seriously in my school	399	3.74	1.309	Positive
17	I believe that climate change can lead to school absenteeism	399	3.74	1.285	Positive
18	I feel that trees should be planted in our school compound	399	3.82	1.254	Positive
19	I believe that flooding is caused by climate change	399	3.77	1.261	Positive
20	I feel that mitigation can help reduce climate change impact in our society	399	3.74	1.279	Positive
	Average		3.74	.688	

Hypothesis One: There is no significant difference in the attitude towards climate change between male and female secondary school Biology students in North East Nigeria.

Table 2 present the result of independent sample t-test analyses for Male and Female Biology students' attitude toward climate change. The Female students had slightly higher mean than the Male students indicating that female students had more positive attitude than male students. The observed p-value is 0.020 and the alpha value is 0.05 with df=397. The observe p-value is less than the alpha value and thus the null hypothesis is rejected. Therefore, there was a significant difference in the attitude of climate change between male and female Biology students in North East Nigeria (t=2.334, df=397, p=0.020<0.05).

Table 2: T-test result of climate change attitude between male and female Biology students in North East Nigeria

Gender	**N**	**Mean**	**SD**	**T**	**df**	**Sig**	**Decision**
Female	194	3.82	.613	2.334	397	.020	S
Male	205	3.66	.746				

Hypothesis Two: There is no significant difference in the Attitude towards Climate Change between rural and urban secondary school Biology students in North East Nigeria.

Table 3 present the result of independent sample t-test analyses for rural and urban Biology students' attitudes toward climate change. Student in urban areas had slightly higher mean than those in rural areas indicating that urban students had more positive attitude than rural areas. The observed p-value is 0.000 and the alpha value is 0.05 with df=397. The observe p-value is less than the alpha value and thus the null hypothesis is rejected. Therefore, there was a significant difference in the attitude of climate change between rural and urban students in North East Nigeria (t=2.334, df=397, p=0.020<0.05).

Table 3: T-test result of climate change attitude between urban and rural Biology students in North East Nigeria

Location	**N**	**Mean**	**SD**	**T**	**Df**	**Sig**	**Decision**
Urban	199	3.91	.651	4.986	397	.000	S
Rural	200	3.57	.684				

DISCUSSION

The finding of this study indicated that Secondary School Biology Students in North East Nigeria had positive attitude towards climate change. This finding agrees with the findings of Falaye and Okwilagwe (2016), Ibrahim et.al (2018), Chairunnisa et.al (2022), Wadson (2023) and Salman et.al (2023) whom found that students had positive attitude towards climate change. The finding disagrees with the finding of Udegbunam and Onyegegbu (2021)

whom found that student have low attitude towards climate change. The reason for this finding could be due to the inclusion of climate change content into the secondary school curriculum with the intention of promoting knowledge and attitude towards climate change.

Finding from the study also revealed that there was a significant difference between Male and Female Biology students in terms of attitude towards climate change. This is in line with the finding of Salman et.al (2023) whom found that gender influences climate change attitude of students. This could be due to the introduction of many programs and project such as the AGILE Project and GEP3 Project that are geared towards the improvement of female students' education.

Finding from the study also revealed that there was a significant difference between rural and urban Biology students in terms of attitude towards climate change. This could be due to students in urban setting could have more access to libraries, laboratories, etc. than those in rural setting (Awodun and oyeniyi, 2018). In addition, lack of social amenities in rural areas impinges on the education services, such amenities are electricity, pipe borne water, technical resources, safe and secure facilities that are essential for successful educational programmes.

CONCLUSION AND RECOMMENDATION

The study concludes that Biology students in North East had positive attitude towards climate change. The study also concludes that there is a significant difference between male and female Biology students in climate change attitude and that there is a significant difference between rural and urban Biology students towards climate change in North East Nigeria. Therefore, the study recommended that students should be encouraged to become climate ambassadors that would promote sustainable practices and inspiring others to act in the community. The study also recommended that there is need to develop educational material and programs that cater to the needs of both genders addressing any gender-based attitude gaps. This study also recommends that specific interventions be made to address attitude gaps between rural and urban students, ensuring equal opportunities for climate change education. Governments and non-governmental organization should ensure that quality education activities carried out in urban areas are obtainable in rural areas. To achieve this, there is need to ensure that qualified teachers are employed to teach in rural areas. Rural areas should be adequately equipped with necessary teaching and learning facilities to ensure effective and efficient learning.

References

Awodun, A. O.1 & Oyeniyi, A. D. (2018) Influence of School Location `on Students" Academic Achievement in Junior Secondary School Basic Science in Ekiti State, Nigeria. *Journal of Emerging Technologies and Innovative Research (JETIR). 5(6)*

Chairunnisa, C., Sriyanti, I., Meilinda, M., Aisyah, N., & Ismet, I. (2022). Knowledge, Beliefs and Attitudes of Junior High School Students in Palembang Towards Climate Change Issues. *Jurnal Penelitian Pendidikan IPA, 8(2), 798–804.*

Deshiana, A., Sriyanti, I., & Ismet, I. (2022). High school students' awareness and attitudes toward climate change. *Berkala Ilmiah Pendidikan Fisika, 10(3), 255-239.*

Ezeudu S. A., Ezeudu F. O. & Sampson M (2016). Climate Change Awareness and Attitude of Senior Secondary Students in Umuahia Education Zone of Abia State. *International Journal of Research in Humanities and Social Studies. 3(3) 7-17*

Falaye, F.V., and Okwilagwe, E. A. (2016). 'Assessing the Senior School Students' Knowledge, Attitude and Practices Related to Climate Change: Implications for Curriculum Review and Teacher Preparation.' *Journal of the International Society for Teacher Education, 20 (1), 43 - 53.*

García Vinuesa, A., Rui Mucova, S. A., Azeiteiro, U. M., Meira Cartea, P. Á., & Pereira, M. (2022). Mozambican students' knowledge and perceptions about climate change: an exploratory study in Pemba City. *International Research in Geographical and Environmental Education, 31(1), 5–21.*

Ibrahim, A. A., Fahmy, H. D., & Mahmoud, S. R. (2018) Knowledge and Attitude regarding Global Warming Phenomenon among Assiut University Students. *Assiut Scientific Nursing Journal* 6 (14) 1-11

IPCC. (2021). Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. *Cambridge: Cambridge University Press.*

Nigeria educational research and development council (2013). *Senior Secondary school curriculum. Abuja:NERDC.*

Ofori, B. Y., Ameade E. P. K., Ohemeng, F., Musah, Y., Quartey, J. K., Owusu, E. H. (2023) Climate change knowledge, attitude and perception of undergraduate studentsin Ghana. *PLOS Clim 2(6)*

Rahman, M. S., Overgaard, H. J., Pientong, C., Mayxay, M., Ekalaksananan, T., Aromseree, S. … Haque, U. (2021). Knowledge, attitudes, and practices on climate change and dengue in Lao People's Democratic Republic and Thailand. *Environmental Research, 193(110509), 1-11.*

Salman, N., Al-Mannai, M., Abahussain, A., and Alalawi, M. S. M. (2023) Young Students' Knowledge, Attitude and Practice towards Climate Change. Global Warming - A Concerning Component of Climate Change 1-9

Sulistyawati, S., Mulasari, S.A., & Sukesi, T.W. (2018). Assessment of knowledge regarding climate change and health among adolescents in Yogyakarta, Indonesia. *Journal of Environmental and Public Health, 2018(9716831), 1-7.*

Udegbunam E. & Onyegegbu, N. (2021). Awareness and attitude of secondary school biology teachers and students on climate change adaptation in awka education zone of Anambra state. *African Journal of Science, Technology & Mathematics Education (AJSTME), 6(1), 204–216.*

Udegbunam E. (2020) Climate Change Adaptation Awareness and Attitude Among Secondary School Biology Teachers and Students in Awka Education Zone of Anambra State. (Unpublished Master's thesis) University of Nigeria Nsukka.

Ugwu, N. F., Onyekwere, O. K., Adekoya A. F., Anibueze, A. U., and Ibeneme C. B (2021) Strategies for Enhancing Climate Change Knowledge, Attitude and Practices: Examining the Views of Experts. *Nigerian Journal of Health Promotion Vol. 14, 128-138*

United States Global Change Research Program (USGCRP, 2017). Climate Science Special Report.Retrieved from science2017.globalchange.gov/downloads/CSSR2017_FullReport.

Wadson, D., Mulenga, I. M., & Milupi, I., (2023) Climate Change Education in Malawi: Examining Learners' Knowledge, Attitudes and Practices Towards Learning Climate Change Education Content in Senior Secondary Schools. *Zambia Journal of Contemporary 37 (2)* 67-86

Yadav, V. & Atrey, S. (2023) Attitude Type and Theories. *Just agriculture (3)7 584-587*.