

Awareness and Causes of Climate Change in Technical Colleges in Nigeria

by

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Abstract

Climate change is a global issue as current disastrous occurrences in the world have confirmed that and studies have identified that persistent human activities also cause climate change. This study assessed the level of awareness and causes of climate change in Technical Colleges in Nigeria. The study adopted a descriptive survey design. The population for the study comprised of all technical college students in Nigeria. A simple random sampling technique was used to select 600 technical college students (in their second and third year) in technical colleges across Nigeria. A self-developed questionnaire with a reliability coefficient of 0.82 using Cronbach Alpha reliability method was used as instrument for data collection. Data were analyzed using simple percentages. The results showed that technical college students possessed high level of awareness on the concept of climate change, have access to the sources of information. Recommendations include that climate change education should be structured and embedded in the curricula of technical colleges at all levels and that training, re-training, empowerment or enlightenment of the public and stakeholders in climate change should be carried out without bias, discrimination or marginalization of any form.

Keywords: Net zero, Awareness, Climate change, Technical Colleges.

Introduction

Climate change has become an environmentally threatening phenomenon. An effective strategy which can help tackle the issue is the concern and action by the human beings who are noted to be the main cause and affected by the problem. Public actions can only be likely where the tendency to behave and response is made more vibrant. However, the presence of poor understanding of climate change poses much more difficulty in explaining and eliciting people's expected action and concern to the issue. This can weaken and annul efforts towards adaptation and mitigation. The World Health Organization (World Health Organization, 2019), has indicated that climate change has become a distinctive and significant addition to the range of environmental hazards encountered by humankind. The United Nations (United Nations, 2016) also observes that global pursuit for sustainable development is under serious threat because of the impact of climate change. There are increasing

evidence that suggests that most places in the world will be transformed and lost through the impacts of a changing climate (Adger, et al., 2009). Urgent action is thus expected of mankind to tackle this danger (IPCC, 2014).

The United States Environmental Protection Agency (USEPA, 2014) stated that Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer. Knutson (2011) referred to climate change research as a big endeavour because of its involvement with the entire planet and everything that affects their survival. Also, climate change connotes a change in climate over a period of time, usually a decade or more due to nature and/or human activities (IPCC 2014). Most scientists such as Eboh (2009); Anyadike (2009); Hönisch, Ridgwell, Schmidt, Thomas, Samantha, Gibbs, (2012); Ashton (2022) and

scientific research institutions (Pew Centre on Global Climate Change, 2009), National Oceanic and Atmospheric Association, NOAA(2007) etc. have also offered similar meaning. There are a lot of research findings and predictions which supports the manifestation of climate change. For instance, the International Panel of Climate Change (IPCC, 2013) has revealed that global temperature has increased by about 2.0 Degree Celsius over the last 100 years; sea levels are rising and extreme events such as heat waves, heavy rainfall and shrinking Arctic sea ice are all occurring. The panel has also predicted more gloomy times ahead as well. These findings and predictions have been acknowledged by most scientists (see Hönisch et al. 2012, National Research Council 2013, NOAA 2013). The Anthropogenic Global Warming (AGW) and Human Induced theories of climate change all attributes climate change to human activities (Blast, 2010). Thus, demanding significant efforts from human beings on its related issues such as water stress, species extinction, low productivity, floods, food insecurity, diseases and many others (WHO 2019, IPCC 2014). Due to this, it is seen as the most serious threats that affects the development of every nations around the world (Bozoglu, Topuz, Baser, Shahbaz, & Eroglu, 2022). In addition to this threats, climate change may also affect countries that are just developing to achieve United Nations Sustainable Development Goals by 2030 (United Nations, 2016).

Nigeria is no exception to the incidence and threats of climate change. In Nigeria, Falaye & Okwilagwe (2016) reveal that the identified factors have been exerting negative effects on the landscape with cities like Lagos, Ibadan, Benin, Warri, Port Harcourt, Calabar and those along major waterways like Lokoja experiencing flooding after heavy rains causing loss of human lives, livestock and property. Other noticeable

consequences of climate change in Nigeria are changes in the vegetation type, decline in forest resources, soil moisture and nutrients, increased health risks, the spread of infectious diseases, intense thunderstorms and incessant droughts (Bello, 2014). Despite the enormous challenges and threats of climate change, many Nigerians are still unaware of it. The adverse effect of climate change on the socio-economic life of the people is exacerbated by a lack of knowledge of the causes, impacts and adaptation strategies among the generality of the people. The lack of knowledge on climate change issues makes the people engage in activities that contribute to the problem rather than mitigate it (Adamgbe, Akombo, Gundu, & Gesa, 2018).

Young people are likely to be engaged in social issues if the issues are relevant to their lived experiences (Brady, Dolan, Kearns, Kennan, McGrath, Shaw and Brennan, 2012). Brennan (2008) reveals that recognizing youth resiliency is a greater resource for community and national adaptive capacities and well-being. The technical colleges are a high level centre for learning. It is expedient that students in these technical colleges are not ignorant of climate change issues. The awareness and possession of knowledge and understanding of climate change concepts and phenomena although scientific, are expedient for all humans, suffice to state that undergraduates in these technical colleges assume the responsibility of transferring the knowledge when they graduate and practice their professions (Nath, 2009). A climate literate person: understandings the essential principles of Earth's climate system, knows how to assess scientifically credible information about climate, communicates about climate and climate change in a meaningful way and is able to make informed and responsible decisions with regard to actions that may affect climate. Students can be part of the solutions of achieving climate change. They are the ones that can tell people

about the technologies that would reduce the amount of greenhouse gases being added to the atmosphere, actions to be taken to save energy and slow climate change and explore ways people can prepare for climate change. Technical college students should be aware of the global warming and climate change, acidification of the oceans and poverty eradication. The study focused on second and final year (third year) undergraduates' level of awareness of climate change in selected technical colleges across Nigeria. It will thus be very prudent to assess whether technical college students are aware of what climate change is or its effect, hence this study.

Statement of the Problem

Climate change is both an international and national concern as the ozone layer begins to deplete. This causes drought and unpredictable changes to the atmosphere thereby affecting the environment for sustainability. Climate change occurs as a result of man's interference with nature. Though there are situations these changes occur naturally beyond man's control, such as volcanic eruptions, and earthquakes. Climate change started with the creation of man because of the need for survival. Man started interfering with nature to meet his insatiable ends and means of survival. This outcome of man's interference with nature affected the ozone layer by reducing the Greenhouse gas.

The interference of man with the environment affects the ozone layer in reducing Green House Gases, arising from gas flaring, agricultural activities, transportation, land charges and encroachment into the sea. Consequently, it becomes imperative for nations to actively engage other nations in addressing this issue, primarily through negotiations and the formation of international treaties. Public understanding, knowledge and research are noted as critical tools to tackle human-induced climate change (Moser, 2010). Public resistance to changing relevant

behaviours remains a key issue for research, especially given apparent increases in public awareness of the scientific arguments (Exley & Christie, 2003). Public reactions and engagement to climate change remains noticeably incomplete in Nigeria.

The few available researches have been largely focused on the western world and marginalised vulnerable African countries like Ghana, Nigeria, (BBC 2009, Shahadu, 2012, Agboola, 2016, Ola, 2024). Though previous researches have indicated that the Nigeria public do not understand climate change that cannot justify that for Technical Colleges students, which are special groups with much exposure to knowledge and information sources. To ensure adequate adaptation and mitigation of the harmful impacts of climate change to our society, there is need for adequate knowledge of climate change. Hence the need for this study.

Purpose of the Study

The overall purpose of the study is to determine awareness and causes of climate change in Technical Colleges in Nigeria. Therefore, the specific objectives of the study are to:

1. Determine the level of technical college students' knowledge/awareness of climate change.
2. Find out the technical colleges' students' view of the causes of climate change.
3. Determine the accessibility of technical college students to sources of information on climate change.

Research Questions

The research was guided by the following research questions;

1. What is the level of technical college students' knowledge of climate change?
2. What is the technical colleges' students' view of the causes of climate change?

- How accessible are the technical college students to sources of information on climate change?

Methodology

The study adopted a descriptive survey design which requires the opinion to respond to some variables. The population of the study comprised of all second and third year undergraduates in technical colleges in Nigeria. The sample constituted 600 undergraduate students (in their second and third year) in technical colleges across Nigeria. The research instrument was a questionnaire developed by the researcher and it was titled ‘awareness and causes of climate Questionnaire’ was used to collect data from the subjects. The instrument rated on a 4-point scale. The questionnaire was divided into two parts (I & II). part I focused on the respondent’s bio-data such as age, sex, level, etc. This will enable the researcher in preliminary analysis. Part II consists of three sections. Section A consists of six items on awareness, Section B consists of twelve items of causes of climate change while, section C consists of eight items of sources of information on climate change for the purpose

of this research work the questionnaire was rated on a 4 point scale with such category as strongly agree, agree, strongly disagree, disagree in order to efficiently elicit the exact responses from the respondent.

The research instrument was validated by experts. Content and construct validity was obtained by the help of other experts. All corrections and constructive criticism raised by the experts were taken into consideration in the preparation of the final version of the instrument. Reliability within the survey was obtained by calculating the correlation coefficient for each scale. The Cronbach’s alpha coefficient is 0.82. The research instrument which was the questionnaire was personally administered by the researchers to the respondents in their various institutions of learning. It must be noted that in administering the questionnaire, respondents were informed that confidentiality will be maintained. The respondents were then required to complete the questionnaire as sincerely as they could. Six hundred (600) copies of the questionnaire were administered and they were all filled and collected back for further analysis.

Results

Table 1: Determining the level of technical college students’ knowledge/awareness of climate change

Parameter	Classification	Frequency	Percentage(%)
Climate change is happening	Yes	588	97.0
	No	9	3.0
	Total	597	100
Climate change manifests in diverse ways in The world	Yes	579	94.3
	No	17	5.7
	Total	596	100
We are already experiencing the impacts of Climatic change	Yes	569	92.1
	No	23	7.9
	Total	592	100
I see climate change to be of immediate and Urgent concern	Yes	549	85.6
	No	42	14.4
	Total	591	100
Climate change is a threat to sustainable Development	Yes	561	89.7
	No	30	10.3
	Total	591	100
There are climate change research agencies At both National and global levels that I Know	Yes	554	86.7
	No	39	13.3
	Total	593	100

Table 1 determines the level of technical college students' knowledge/awareness on the concept of climate change. The result indicated that 97% agreed that climate change is happening while 3% disagreed. Also 94.3% agreed that climate change manifests in diverse ways in the world while 5.7% disagreed. 92.1% also believed that we are already experiencing the impacts of climate change while 7.9% still

disagreed. It is also believed by 85.6% that climate change should be of immediate and urgent attention while 14.4% disagreed. 89.7% believed that climate change is a threat to sustainable development while 10.3% disagreed. Also 86.7% believed that there are climate change research agencies at both National and Global levels while 13.3% believed that there are no research agencies at both National and Global levels.

Table 2. Technical colleges' students' view of the causes of climate change

Parameter	Classification	Frequency	Percentage(%)
Climate change is more harmful than beneficial	Yes	539	87.2
	No	35	12.8
	Total	574	100
Climate change is caused mostly by human activities, not natural changes in the environment	Yes	526	78.2
	No	63	21.8
	Total	589	100
Climate change increases surface temperature	Yes	547	85.8
	No	41	14.2
	Total	588	100
Climate change causes rise in sea levels	Yes	533	80.6
	No	56	19.4
	Total	589	100
Climate change increases the intensity of extreme weather events like heat waves, tornadoes, hurricanes and heavy rainfalls	Yes	555	88.2
	No	34	11.8
	Total	589	100
Climate change leads to longer and more Drought	Yes	525	78.7
	No	61	21.3
	Total	586	100
Climate change leads to coastal erosion	Yes	525	80.4
	No	55	19.6
	Total	580	100
Climate change influences agricultural yields Negatively	Yes	528	79.2
	No	60	20.8
	Total	588	100
Climate change results in acidification of Oceans thereby creating drops in fishing yields	Yes	522	77.1
	No	66	22.9
	Total	588	100
Climate change poses threats to food security	Yes	526	78.7
	No	61	21.3
	Total	587	100
Climate change causes economic depression	Yes	523	76.9
	No	67	23.1
	Total	590	100

Table 2 determines technical colleges' students' view of the causes of climate change. There

is indicated that 87.2% agreed that climate change is more harmful than beneficial while 12.8% disagreed. Also 78.2% agreed that climate change is

caused mostly by human activities, not natural changes in the environment while 21.8% disagreed. 85.8% also believed that climate change increases surface temperature while 14.2% still disagreed. It is also believed by 83.8% that climate change causes rise in sea levels while 14.2% disagreed. 88.2% believed that climate change increases the intensity of extreme weather events like heat waves, tornadoes, hurricanes and heavy rain falls while 11.8% disagreed. Also 78.7% believed that climate change leads to longer and more drought while 21.3

% do not agree. 80.4% agreed that climate change leads to coastal erosion while 19.6% disagreed. 79.2% believed that climate change influences agricultural yields negatively while 20.8% disagreed. Also 77.1% believed that climate change results in acidification of oceans thereby creating drops in fishing yields while 22.9% disagreed. 78.7% believed that climate change poses threats to food security while 21.3% disagreed. Also 76.9% believed that climate change causes economic depression while 23.1% disagreed.

Table 3: Determining the accessibility of technical college students to sources of information on climate change

Parameter	Classification	Frequency	Percentage(%)	
I obtain access to information on climate and sustainable development through the subjects taken in my secondary school days	Change and Taken in my	Yes	552	87.2
		No	37	12.8
	Total		589	100
I obtain access to information on climate and sustainable development through the courses taken at the university	Change and Taken at the	Yes	538	82.4
		No	51	17.6
	Total		589	100
I obtain access to information on climate and sustainable development through literature books that I read	Change and	Yes	502	70.1
		No	86	29.9
	Total		588	100
I obtain access to information on climate change and sustainable development through school pamphlets and reading materials	Change and	Yes	515	74.4
		No	74	25.6
	Total		589	100
I obtain access to information on climate change and sustainable development through research reports and periodicals in the library	Change and	Yes	529	79.8
		No	58	20.2
	Total		587	100
I obtain access to information on climate change and sustainable development through documentaries on the television	Change and	Yes	568	93.4
		No	19	6.6
	Total		587	100
I obtain access to information on climate change and sustainable development through broadcasts and enlightenment programmes on radio and television	Change and	Yes	555	88.9
		No	32	11.1
	Total		587	100
I obtain access to information on climate change and sustainable development through literature books that they read	Change and	Yes	547	86.7
		No		

Table 3 determines the accessibility of undergraduates to sources of information on climate change and sustainable development. 87.2% agreed that they had access to information on climate change and sustainable development through the subjects taken by undergraduates in their secondary school days while 12.8% disagreed. 82.4% agreed that they obtained access to information on climate change and sustainable development through the courses taken at the university while 17.6% disagreed.

70.1% agreed that they had access to information on climate change and sustainable development through literature books that they read while 29.9% disagreed. 74.4% agreed that they obtained access to information on climate change and sustainable development through school pamphlets and reading materials while 25.6% disagreed. 79.8% agreed that they obtained access to information on climate change and sustainable development through research reports and periodicals in the library while 20.2%

disagreed. Also 93.4% obtained access to information on climate change and sustainable development through documentaries on the television while 6.6% disagreed. 88.9% agreed that they obtained access to information on climate change and sustainable development through broadcasts and enlightenment programmes on radio and television while 11.1% disagreed. 86.7% agreed that they obtained access to information on climate change and sustainable development through newspapers and magazines while 13.3% disagreed. 74.9% agreed that they obtained access to information on climate change and sustainable development through parents and guardians while 25.1% disagreed. 73.2% agreed that they obtained access to information on climate change and sustainable development through peers, friends, siblings and relatives while 26.8% disagreed. 77.1% agreed that they obtain access to information on climate change and sustainable development through seminars and workshops that they attended while 22.1% disagreed. Also 75.3% agreed that while 24.7% disagreed. 90.6% agreed that they obtained access to information on climate change and sustainable development through internet and World Wide Web while 9.4% disagreed. 82.3% agreed that they obtained access to information on climate change and sustainable development through computer networking while 17.7% disagreed. 82.2% agreed that they obtained access to information on climate change and sustainable development through multi-functional mobile phones while 17.8% disagreed. Also 74.7% agreed that they obtain access to information on climate change and sustainable development through electronic objects or simulations while 25.3% disagreed.

Discussion

The findings of this study revealed that

majority of the respondents are aware of climate change and the level of awareness is significant. The personal experience gathered greatly influenced the respondent's awareness. The results were similar to the finding of Olajide *et al.* (2011) who found knowledge of global warming among undergraduate students of Obafemi Awolowo University (OAU), Ile Ife, Nigeria, depending on their ages and gender.

Another study conducted in Philippines showed that the capacity of students to generate researches on climate change adaptation (ACA) and disaster risk reduction management (DRRM) depended on their former exposure to relevant areas of climate change (Pesimo, 2016). It was suggested that topics on ACA and DRRM should be integrated in the biological and earth sciences. From the aforesaid it may be necessary to introduce a general study course in these technical colleges for Climate Literacy. Research findings also showed in a research in Ankara (Turkey) on environmental sensitivity and awareness of university students that even though students take many courses on the environmental issues, their environmental awareness and environmentally responsible behaviours are lower than the expected and students' grades show no significance on the results. The first and fourth year students of landscape architecture, town and regional planning and environmental engineering undergraduate programs at universities throughout Ankara, Turkey were selected as participants since these programmes' curricula focus on environment. It is concluded that environmental knowledge do not always influence awareness and behavioral intentions, a national strategy is needed for environmental education in higher education, and current curricula should be reconsidered in terms of

effectiveness(Ouz, Çakci, & Kavas, 2014).

InasimilarresearchinAdawawaState,Nigeria,aimedatexaminingthegenerallevelofawarenessofclimatechange impacts and adaptations, the results showed that there is a high level of awareness of climate change amongthe citizens of the state (Adebayo, Mubi, Zemba, & Umar, 2013). This is similar to the findings of Ishaya and Abaje (2008) in JemaaLocal Government Area of Kaduna State, Nigeria that majority of the local people are aware of changes in climate.Almostallrespondents,bothmalesand females,wereawareofclimatechangeevenif theydon'tknowthecauses.IntheState,evidenceofclimatechangeincludesdelayedonsetdateofrains,increaseinnumberofdrydaysduring the raining season, decrease in annual rainfall and increase in maximum temperature (Adebayo, Mubi, Zemba, & Umar, 2013; Olajide, et al., 2011). Respondents' could see that temperature and length of dry season are increasing while rainfall is decreasing. InNigeriaingeneral,accordingtoexperts'reportsthemeanttemperatureisincreasingwhileannualrainfallisdecreasing (Odjugo, 2009; Adebayo *et al*, 2013; Umar, 2013). It was also reported that in Tharu community of Nepalsuffered lossoftimberandfirewood speciesdueto climate change(Maharjan, Sidgel, Sthapit, & Regmi, 2017) InIndia,asurveywasconductedinvolvingschoolchildren,undergraduatestudentsandadultsfromvarioussectorsto know the level awareness of climate change and its effects. The survey was conducted in Metropolitan cityMumbaiandsemiurbanareaofPanvelnearMumbai.Manyschoolchildrenandundergraduatestudentsreportedthat they are aware of climate change but not aware of its

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problems and how to tackle it. Whereas fishermen ofPanvel area agreed that climate change has affected fishery harvest but not sure which factor of climate changecaused it. More than 50% respondents said that they are getting information of climate change from print andelectronic media.However, most of these people are unaware of health problems caused by climate change.Fishermen and coastal people were not aware of ocean acidification and possible damage to the ocean resources dueto ocean acidification. Furthermore, most of the respondents did not know how to minimize climate change. Theauthors concluded that in Maharashtra still there is need to make people literate about climate change and its effectsonhuman health (Kulkarni, Kulkarni, Kupekar, & Babar, 2016).

Conclusion

Prevailing human activities as well as natural phenomena constitute agents of climate change and they must becontrolled.Thisjustifiestheneedforawarenessandenlightenmentonclimatechange. All countries are vulnerable to the adverse impacts of climate change; hence it is imperative to see that every individual is knowledgeable and well informed. Questions about global warming, unstable weather, and climate crisis should be asked and solutions sought. Awareness on climate change among all and sundry is pertinent and education is an essential component and catalyst for responding to global climate in its efficacy to raise awareness and promote knowledge and skills development on climate issues and related concept.

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