

CLIMATE CHANGE AWARENESS AND STRATEGIES FOR ENLIGHTENMENT AMONG ADULT EDUCATION LECTURERS IN FEDERAL UNIVERSITIES IN SOUTH EAST NIGERIA

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ABSTRACT

This cross-sectional questionnaire survey was undertaken among lecturers in the departments of adult education in federal universities in South East Nigeria to determine their awareness status on climate change. Responses of 25 lecturers that completed and returned their questionnaires were used for analysis out of the population of 42 lecturers that were sampled. Mean and standard deviation were the statistics used. The study found that adult education lecturers in the South East Universities were aware of most of the items on climate change. Male lectures were significantly more aware than female lecturers. Additionally, the study identified some strategies that can be used to create awareness of climate change and they include organizing seminars, workshops, conferences and symposia; formulation and use of radio and television jingles; regular enlightenment campaign programmes in strategic venues; deliberate inclusion of climate change issues into adult and non-formal education programmes for various categories of learners; and formulation of environment conscious groups in various communities. The study concludes that although adult education lecturers in the study site were adjudged aware of climate change, they still need to be educated more on the global and national mitigation and adaptation policies. More efforts should be made to enlighten female lecturers about climate change. It was recommended that the programmes and strategies elicited from respondents be used to create awareness.

Keywords: Climate change, awareness, adult education, lecturers and strategies

Introduction

The threat posed by climate change should be among the key points in any meaningful discourse of the subject matter 'Re-Engineering Education for Good Governance, Security, Creativity and Environmental Protection for National Development in COVID-19 Era'. This is because of the imminent danger climate change poses to the existence of mankind if it is not reduced. Climate change has been globally recognized as one of the major threats of the 21st Century. This is why Sustainable Development Goal [SDG] 13 harps on the need to take urgent action to combat climate change (United Nations Environment Programme [UNEP], n.d.). The terms climate change and global warming are sometimes used interchangeably. Based on observed usage of the terms by experts, climate change refers to the long-term rise in the average temperature of the earth's climate system due to both man-made and natural cause of events while global warming is the human-caused increase in global surface temperatures and its projected continuation. According to Bello (2015), independent researchers have analyzed temperature profiles for the past century and the result point to one thing which is a rise (up to 0.80⁰C) in average surface temperature. Bello further stated that other circumstantial facts such as melting glaciers at the polar region and lengthening growing season across Northern atmosphere attest to the reality of global warming. Climate change is increasing the frequency and intensity of extreme weather events such as heat waves, droughts, floods and tropical cyclones, aggravating water management problems, reducing agricultural production and food security, increasing health risks, damaging critical infrastructure and interrupting the provision of basic services such as water and sanitation, education, energy and transport (UNEP, n.d.).

Data and statistics /facts and figures reported by UNEP disclosed that from 1880 to 2012, average global temperature increased by 0.85⁰C; oceans have warmed, the amounts of snow and ice have diminished and sea level has risen while the Arctic's sea ice extent has shrunk in every successive decade since 1979; global emissions of carbon dioxide (CO₂) have increased by almost 50 per cent since 1990; and emissions grew more quickly between 2000 and 2010 than in each of the three previous decades. A more recent report by National Aeronautics and Space Administration [NASA] (2021), disclosed that emissions of greenhouse gases continued on a relentless rise such that in 2013, the daily level of carbon dioxide in the atmosphere surpassed 400 parts per million for the first time in human history. It is glaring that climate change poses a serious threat to the survival and continual existence of mankind. No region or individual is left out or spared. International community have been trying to limit CO₂ emissions through various mitigation actions with a complimentary effort at adaptation in order to minimize the effect of climate change.

Mitigation involves the reduction in emission of any greenhouse gases that contribute to climate change. According to NASA (2021), it refers to reducing and stabilizing the levels

of heat-trapping greenhouse gases in the atmosphere. In simple terms, mitigation refers to activities that reduce the release of carbon dioxide or whatever other combination of carbon that is harmful to nature. Little wonder, experts hap on the need for low carbon economy globally. According to Iberdrola (2021), measures of mitigation include improving energy efficiency and opting for renewable energy over fossil fuels; promoting public transport and sustainable mobility by increasing the number of journeys in town by bicycle, reducing the number of flights and taking more trips by train or in shared cars; promoting ecological industry, agriculture, fishing and livestock farming, food sustainability, responsible consumption and the three Rs rule (reduce, reuse and recycle); and taxing the use of fossil fuels and CO₂ emissions market. Heider (2019) while making a case for the use of renewable/ clean energy as a way of mitigating the effects of climate change also listed some examples of desirable sectors/ lifestyle choices. They include less meat consumption, phasing out of inefficient appliances, greater access to and use of public transportation, encouragement of public infrastructure and services for effective waste reduction and tree planting and re-forestation.

Despite the attention climate change issues have generated across the globe, it is surprising that some people still live in seeming oblivion of this huge threat to mankind and their contribution to the danger. In Nigeria, it is not uncommon to see people burning household refuse which often include plastic buckets in their compounds daily while others indiscriminately cut down trees without any plan for replacement. It appears many people are still ignorant of their contribution to the depletion of ozone layer and do not know that they can do something to mitigate it. It is likely that this situation cuts across both the educated and not so educated in different degrees. It is necessary for all to key into the global /national mitigation and adaptation responses to climate change for the efforts to address climate change to yield result. For instance, people should know some of the following facts about climate change, to wit; that human activities, when compared with natural factors, is the major cause of climate change; that people in developing countries like Nigeria are more vulnerable to the effects of climate change than developed countries; that there is need to minimize further depletion of the ozone layer that protects man from the harmful ultraviolet rays of the sun; that everybody should be mindful of their carbon print in order to minimize the effect of climate change; that everybody should embrace the three Rs of reduce, reuse and recycle as a way of being personally guided in mitigating the effect of climate change. These issues are too critical to be left to mere assumptions. They should be researched on.

Some researchers have conducted studies on knowledge, preparedness and attitude to climate change among secondary school students, university students, government officials, farmers and rural dwellers (Ojomo et al., 2015; Asekun-Olarinmoge et al.; Ezeudu, Ezeudu& Sampson, 2016; Ayanlade, Radney& Akin-Onigbinde, 2018); but to the best of

these researchers' knowledge, no study has attempted to assess adult education lecturers' awareness of climate change nor sought to elicit programmes / strategies for creating awareness on this impending doom to human existence from them and strategies for creating awareness. Adult education lecturers are particularly trained to help adults learn to tackle ever changing challenges of every aspect of life. Adults as purveyors of development need some form of education in their developmental task. Adults need continuing and life-long education to be able to deal with ever emerging demands of succeeding centuries. They often seek to upgrade their knowledge and capabilities by enrolling in both formal and non-formal education programmes. Some enroll in academic programmes of tertiary institutions such as universities for this purpose. Adult education lecturers have the responsibility of training, teaching, instructing, facilitating, mentoring, coaching, counselling and guiding learners in the various adult education departments. They are expected to weave in discussions of current societal problems, their solutions as well as direct adults on the correct attitude to ever emerging issues of life while facilitating learning. Indeed, teachers at every level are expected to play these roles as it is suitable to their status.

Ishaya and Obaja (2008) as cited in Ezeudu, Ezeudu and Sampson (2016) disclosed that secondary school teachers have been infusing climate change contents into subjects they teach students in Nigeria with the intention of increasing knowledge of climate change as well as influencing attitude to climate change issues. Expectedly, lecturers should use courses taught as veritable means of promoting climate change awareness and correct attitude among their students as well. This study surveys adult education lecturers' awareness of climate change because the extent of their awareness of the problem of climate change is likely to correlate with the efforts they are likely to put into helping those under their influence to learn. They can only give what they have.

Awareness is a sort of radar that operates in the background of our minds and continually scans both the environment outside of ourselves and the state of our internal environment (Brown & Ryan, 2003 as cited in Ackerman (2021). Brown and Ryan saw awareness as what allows us to notice things around us without necessarily focusing exclusively on them. Awareness as envisaged by this paper carries more burden than this. This study sees awareness as knowledge we have that makes us live and act in consciousness of the threat or derivable advantage of the phenomenon we know about. Assessing the extent of awareness of the threat of climate change among adult education lecturers would provide a basis that would guide stakeholders in climate change matters in estimating the extent of awareness of illiterates and rural dwellers among others.

Adult Education lecturers as envisaged in this study are lecturers in the departments of adult education of various faculties of education in the federal universities in South East Nigeria. Although their number is small in size, adult education lecturers were chosen as

the sample for this study because they operate in a discipline that provides an umbrella for the solution of all problems/ challenges of the adult already existing and also emerging. Climate change is a present and pervading threat to life and existence of mankind. Adult education lecturers are in a position to educate the populace on mitigation and adaptation measures to tackle climate change and its effects. For instance, they can sensitize farmers through agriculture extension programs if they have specific weather information, early warning and forest technologies to develop and readjust coping and adaptation strategies (Otitoju and Enete, 2016 in Heider, 2019). Additionally, adult education lecturers' job specification includes lecture, research and contribution to the society through community work. They are likely to participate in enlightening the populace on the issue of climate change if they are aware of the enormity of the problem. Adult education lecturers sometimes facilitate learning in adult literacy centres and some non-formal education programmes. As university lecturers, part of their primary responsibility is to educate university students, who are mainly pupil teachers, and who will in turn teach younger children. Adult education lecturers should be able to conscientize learners under their influence to live climate conscious lives, imbibe habits and attitudes that make for climate sustainability but alas they can only give what they have. Therein lies the need for this study.

Furthermore, most studies on climate change are by experts in Environmental Sciences and related disciplines who used farmers, health workers, secondary school students and the like as respondents. Ojomo, Elliot, Amjad and Bertram (2015) examined the knowledge and attitude of students and governmental officials about the causes, effects and priority given to climate change in Nigeria. Asekun-Olarinmoye, Bamidele, Odu and Olugbenga-Bello (2020) in a 2014 study found poor knowledge of causes and good knowledge of effects of climate change among the populace in rural Southern Nigeria. Ezeudu, Ezeudu and Sampson (2016) surveyed the awareness and attitude of senior secondary students in Umuahia Education Zone of Abia State and found that senior secondary school students have low climate change awareness and attitude but the present study sought the perspectives of those outside direct involvement in environmental issues/policies. The outcome can help in disclosing gaps which should necessarily be filled in order to address the problem of climate change from other perspectives. These researchers contrived to also elicit adult and non-formal education programmes /strategies for creating awareness of climate change from these experts who should know the best strategies to use in getting adults to learn.

Research Questions

1. What is the climate change awareness status of adult education lecturers in federal universities in South East Nigeria?

2. What are the climate change awareness mean scores of male and female lecturers in federal universities in South East Nigeria?
3. What adult and non-formal education programmes and strategies can be used to create awareness of climate change?

Research Hypothesis

The null hypothesis below was tested at 0.05 level of significance.

H₀₁: There is no significant difference in the climate change awareness status of male and female lecturers.

Method

Descriptive survey design was adopted for this study. The study was carried out in the South East of Nigeria. The states in the area are Anambra, Enugu, Imo, Abia and Ebonyi but the study was carried out in the three states where there are federal universities that have departments of Adult and Continuing Education. The instrument was shared to all the lecturers because the number of adult education lecturers in federal universities in the South East were small. They comprised 15 Lecturers from Nnamdi Azikiwe University Awka [NAU] in Anambra State (Source: Study field work, 2020), 23 lecturers from University of Nigeria Nsukka [UNN] in Enugu State (Source: University of Nigeria Nsukka [UNN], 2020) and 4 lecturers from Michael Okpara University of Agriculture Umudike [MOUAU] in Abia State (Source: Study field work, 2020) making it a total population of 42 lecturers. The respondents comprised 25 lecturers (13 male and 12 female) of different positions/cadres that filled and submitted either the hard copy or online questionnaire. Response to the online form was not as high as expected despite repeated sharing of the form in the lecturers' platforms. Adult education lecturers were purposively chosen as the respondents in order to find out the perspectives of these change agents that should drive developmental agenda on the critical issue of climate change. Federal universities were also chosen because they have more departments of Adult education than any other tertiary education sector in the area of study.

The instrument for the study was a questionnaire tagged Climate Change Awareness and Attitude to Mitigation Questionnaire [CCAAMQ] 2020 designed by the authors. It has parts A and B. Part A contains personal data on the respondents while sections A to E under Part B contains items for answering research questions for an entire study from which this report was extracted. The report of the study was too bulky and unwieldy for one paper. The questionnaire items for this paper were in section A (for research questions 1 & 2) and section C (for research question 3) of the said instrument that was used for a larger study. Statements in items 1–14 guided the study on climate change awareness status of adult education lecturers' generally and thereafter based on gender. This section was developed in four Likert scale type of Not at all aware [NA], Slightly aware [SA], Moderately aware [MA] and Extremely aware [EA}. Section C was not structured and it

elicited adult education lecturers' opinion on adult and non-formal education programmes and strategies that can be utilized to create awareness on climate change in order to answer research question 3 of this paper. Both hard copies and online copies (google form) of the questionnaire were administered in order to gather data. Hard copies were administered by the researchers to their colleagues but when restrictions on movements due to covid-19 pandemic made it impossible for physical distribution, online copy of the same questionnaire was designed and used to reach some respondents by sharing the link through the WhatsApp pages of the concerned departments. Data obtained from 25 lecturers (60% of the population) who completed either the online or hardcopy questionnaire were collated and analyzed both manually and electronically with SPSS version 20 using mean and standard deviation for research question 1 and 2. Based on the four-point Likert scale, a mean score of 2.50 was used as the benchmark of those sections. Therefore, any item that scored below 2.50 was seen as **Not Aware** while items that scored 2.50 and above were taken as **Aware**. A frequency table of the list of suggested programmes/strategies was made to show the responses to research question three. The statistic used to test the hypotheses was t-test.

Results

The results of the study are presented in line with the research questions and the hypothesis stated in this paper thus:

Table 1. Mean and standard deviation scores on the extent of climate change awareness among adult education lecturers in federal universities in the South East Nigeria

	Mean	SD	Remark
1. Climate change poses a serious threat to the existence of mankind.	3.40	.91	Aware
2. Human activities compared to natural factors is the main cause of climate change.	2.96	.93	Aware
3. Global policies or initiatives taken by various organizations to reduce climate change.	2.48	.82	Not Aware
4. Developing countries are more vulnerable to the effects of climate change than developed countries.	2.68	1.22	Aware
5. The greenhouse effect results in rise in surface temperature of the earth.	2.96	.98	Aware
6. The number of extreme climate-related disasters (such as droughts, floods and storms) have increased in recent past decades.	2.96	.89	Aware

7. There is need to minimize further depletion of the ozone layer.	2.64	.81	Aware
8. Ozone forms a crucial sunscreen –the ozone layer- that protects man from the harmful ultraviolet rays of the sun	2.68	.90	Aware
9. Everybody should be mindful of their carbon print in order to minimize the effect of climate change.	2.84	.90	Aware
10. The implication of the terms ‘mitigation and adaptation’ as the two broad responses to threat of climate change.	2.24	.88	Not Aware
11. Global temperature has changed compared to previous years	3.00	.87	Aware
12. The three Rs of reduce, reuse and recycle adopted as part of the steps to reduce greenhouse emission	2.32	.90	Not Aware
13. Experts in global environmental protection have agreed to limit the global temperature increase to 20 C.	2.08	.91	Not Aware
14. The richer half of the global population is responsible for greater percentage of world’s carbon emission	2.56	1.00	Aware
Grand Mean	2.71		

Table 1 shows that the mean ratings of adult education lecturers on climate change awareness items range from 2.08 to 3.40. Lecturers were aware of 10 of the items but were not aware of 4 of the items. Based on the decision rule, with a grand mean of 2.71, adult education lecturers are adjudged aware of climate change.

Table 2: Mean and standard deviation scores on the extent of climate change awareness among male and female adult education lecturers in federal universities in the South East Nigeria

	Male (N=13)		Female (N=12)			
	Mean	SD	Mean	SD	Remark	
1 Climate change poses a serious threat to the existence of mankind.	3.23	1.09	Aware	3.58	.67	Aware

2	Human activities compared to natural factors is the main cause of climate change.	2.92	.95	Aware	3.00	.95	Aware
3	Global policies or initiatives taken by various organizations to reduce climate change.	2.54	.88	Aware	2.42	.79	Not Aware
4	Developing countries are more vulnerable to the effects of climate change than developed countries.	3.23	.93	Aware	2.08	1.24	Not Aware
5	The greenhouse effect results in rise in surface temperature of the earth.	3.23	.93	Aware	2.67	.98	Aware
6	The number of extreme climate-related disasters (such as droughts, floods and storms) have increased in recent past decades.	3.23	.60	Aware	2.67	1.07	Aware
7	There is need to minimize further depletion of the ozone layer.	2.77	.93	Aware	2.50	.67	Aware
8	Ozone forms a crucial sunscreen –the ozone layer– that protects man from the harmful ultraviolet rays of the sun	2.62	.87	Aware	2.75	.97	Aware
9	Everybody should be mindful of their carbon print in order to minimize the effect of climate change.	2.85	.90	Aware	2.83	.94	Aware
10	The implication of the terms ‘mitigation and adaptation’ as the two broad responses to threat of climate change.	2.62	.96	Aware	1.83	.58	Not Aware
11	Global temperature has changed compared to previous years	2.85	.99	Aware	3.17	.72	Aware

12	The three Rs of reduce, reuse and recycle adopted as part of the steps to reduce greenhouse emission	2.54	.97	Aware	2.08	.79	Not Aware
13	Experts in global environmental protection have agreed to limit the global temperature increase to 20 C.	2.38	1.04	Not Aware	1.75	.62	Not Aware
14	The richer half of the global population is responsible for greater percentage of world's carbon emission	2.69	1.03	Aware	2.42	1.00	Not Aware
GRAND MEAN				2.87		2.55	

Table 2 shows the climate change awareness mean scores of male and female lecturers in federal universities in South East Nigeria. Male lecturers were aware of all the items except item 13 while female lecturers were aware of only 8 out of the 14 items. Male lecturers had the grand mean score of 2.87 while female lecturers had the grand mean score of 2.55. This shows that male lecturers are more aware of climate change than female lecturers.

Table 3: List of Adult and non-formal education programmes and strategies for creating awareness of climate change elicited from respondents

The respondents mentioned the following adult and non-formal education programmes and strategies that can be used to create awareness on climate change. They are as follows in order of most stated/mentioned:

S/N	PROGRAMMES/STRATEGIES	SUGGESTED	BY	LECTURERS
FREQUENCY				
RANK				
1.	Organizing seminars, workshops, conferences and symposia.	11		1st
2.	Formulation and use of radio and television jingles.	10		2nd
3.	Regular enlightenment campaign programmes in town halls, churches and the market places.	1		12th
4.	Use of grass root campaigns by making it compulsory for every community development worker in various communities to organize enlightenment campaigns at stated intervals in every community.	6		5th
5.	Use of community gatherings to teach about climate change and also ensuring the involvement of community influencers in the campaigns. E.g. monthly and annual meetings of groups.	7		4th

6. Utilization of the occasion of annual festivals and events to create awareness.	4	6th
7. Rigorous involvement of the media whether social media or otherwise.	7	4th
8. Use of Agriculture extension and training the trainer programmes.	2	11th
9. Organizing programmes on sustainable use of natural resources	4	6th
10. Deliberate inclusion of climate change challenges into adult and non-formal education programmes for various categories of learners.	3	10th
11. Formulation of environment conscious groups in various communities.	8	3rd
12. Use Each One-Teach One strategy.	4	6th
TOTAL	67	

All the 25 respondents that submitted their questionnaire after filling it out proffered suggestions except one person who did not fill that section. The most frequent item is seminars, workshops, conferences and symposia; followed by formulation and use of radio and television jingles to create awareness; and then formulation of environment conscious groups in various communities

Hypothesis

H₀₁: There is no significant difference in the climate change awareness status of male and female lecturers.

Table 3: t- test analysis of the difference in the climate change awareness between male and female lecturers in federal universities in South East Nigeria

Source of variation	N	Mean	SD	df	t-cal	P-value	Decision
Male	13	2.84	.87	23	.84	.41	Sig
Female	12	2.55	.78				

The results in table 3 shows that the mean score for males ($M=2.84$, $SD=.87$) was significantly greater than that of the females ($M=2.55$, $SD=.78$); With $df =23$, $t\text{-cal} =.84$ and $p=.41$, the null hypothesis of no significant difference between the two groups on their climate change awareness was therefore rejected.

Discussion

The findings of the study revealed that adult education lecturers in federal universities in South East of Nigeria were aware of most of the items raised about climate change. Adult education lecturers were aware that climate change poses a serious threat to the existence of mankind; that human activities compared to natural factors is the main cause of climate

change.; that developing countries are more vulnerable to the effects of climate change than developed countries; that the greenhouse effect results in rise in surface temperature of the earth; that the number of extreme climate-related disasters (such as droughts, floods and storms) have increased in recent past decades; that there is need to minimize further depletion of the ozone layer; that ozone forms a crucial sunscreen, the ozone layer, that protects man from the harmful ultraviolet rays of the sun; that everybody should be mindful of their carbon print in order to minimize the effect of climate change; that global temperature has changed compared to previous years; and that the richer half of the global population is responsible for greater percentage of world's carbon emission. On the other hand, the findings reveal that ADE lecturers were not aware of global policies or initiatives taken by various organizations to reduce climate change; of the implication of the terms 'mitigation and adaptation' as the two broad responses to threat of climate change; of the three Rs of reduce, reuse and recycle adopted as part of the steps to reduce greenhouse emission; and of the fact that experts in global environmental protection have agreed to limit the global temperature increase to 2^o C. It can be summarized that although the respondents are aware of climate change many climate change facts, they lack awareness of the global and national strategy for reducing the effect of climate change. In effect, they lack concrete knowledge of action to take against climate change. These findings, though not on all fours with the structure of earlier studies, share both differences from and similarities to earlier studies to some extent. The present study's finding is similar to that of Bello (2015) who found that students' level of awareness about climate change is moderate. Similarly, 90% of participants in Ojomo et.al (2015) believe human activities are significant cause of climate change in Nigeria. The present study's finding that show that most ADE lecturers were aware that human activities compared to natural factors is the main cause of climate change is similar to Ojomo's finding. Majority of the respondents in Asekun-Olarinmoye et al. (2020), Ayanlade, Radney and Akin-Onigbinde (2018) and Onyekuru and Marchant (2017) were aware that climate is changing. Item 6 of the present study (the number of extreme climate-related disasters such as droughts, floods and storms have increased in recent past decades) is similar to their findings. It shows that they are aware that climate is changing. Similarly, the study by Wei et al. (2014) while revealing that most respondents indicated that emission of greenhouse gases was the cause of climate change, which is in tandem with the present study's finding for item 5 where most respondents were aware that the greenhouse effect results in rise in surface temperature of the earth, also showed that most CDC health professionals in Shanxi Province China lack knowledge of greenhouse gases and their sources.

The findings of Ezeudu, Ezeudu and Sampson (2016) also differ from the present one in that they found low climate change awareness among senior secondary students in Umuahia Education zone. Nzeadibe et al. (2011) also found that the level of awareness of local communities in the Niger Delta Region of Nigeria on impact of climate change was

still low. Awareness of any issue is a fundamental step in tackling it (Ster & Grundman, 2012 as cited in Ojomo et al. (2015). The awareness status of ADE lecturers in this case may be because they are highly educated people that are supposed to possess life-long learning mindset by virtue of their specialization in adult education. The fact that they are merely aware is a serious indication that efforts should be made to further educate them so that they can in turn educate others. Drivers of climate change matters cannot afford to presume in these matters. There is need to engage everybody at whatever level they are in so that there will be synergy in the attempt to save the world.

The present study also found that gender had significant effect on the climate change awareness mean scores of respondents. Male lecturers were found to be significantly more aware of climate change than female lecturers. This finding is not consistent with the earlier findings of Bello (2015) and Ezeudu, Ezeudu and Sampson (2016) were not as a result of influence of gender. The two studies found no significant difference between the male and female students' mean scores on awareness of climate change. The different finding in the present study may be due to patriarchy, culture and stereotype in the roles of women in the study area. Both male and female lecturers do the same work in the office but at home, males relax, read newspapers and listen to news while their female counterparts face cooking for the family and other chores. They hardly find time to relax and listen to news and current affairs. Expectedly, males tend to know more on trending serious issues like climate change. Besides, Ezeudu's study respondents were students whose gender roles at home were not yet so clearly cut out, so it can be assumed that they had equal opportunity to non-formal education on climate change, hence the no significant difference in their awareness status. The implication of this particular finding is that more effort should be devoted to deliberately offering education opportunities to female lecturers and women generally on climate change. It is what they know and do concerning climate change that will shape the attitude of their children and other people under their influence towards the same phenomenon.

Additionally, the present study elicited some non-formal education programmes and strategies for creating awareness of climate change from respondents as can be seen in table 3 of this paper. They are listed as follows in order of most highly mentioned organizing - seminars, workshops, conferences and symposia; formulation and use of radio and television jingles; formulation of environment conscious groups in various communities; use of community gatherings to teach about climate change and also ensuring the involvement of community influencers in the campaigns, e.g. monthly and annual meetings of groups; use of grass root campaigns by making it compulsory for every community development worker in various communities to organize enlightenment campaigns at stated intervals in every community; utilization of the occasion of annual festivals and events to create awareness; organizing programmes on sustainable use of

natural resources; use of each one -teach one strategy to create awareness; deliberate inclusion of climate change challenges into adult and non-formal education programmes for various categories of learners; and regular enlightenment campaign programmes in town halls, churches and the market places. These findings agree with those of Nzeadibe et al. (2011) who found that mass media played a major role in climate change awareness in Niger Delta Region, Amanchukwu et al. (2015) as cited in Heider (2019) recommended use of interactive blogs, poems, etc., Eheazu and Ezeala (2017) determined some environmental adult education programme to help fish farmers mitigate the impact of climate change and they include environmental awareness programme for illiterate farmers, extension programmes, seminars/workshops, sponsoring demonstration programmes for farmers to learn the essence of afforestation to reduce impacts of climate change. All effective strategies should be used by stakeholders in climate change matters to educate people on the dangers of climate change. Deliberate efforts should be made to arouse and sustain the interest of more adult lecturers in climate change issues so that they can in turn optimally affect those under their influence in various aspects of life where they operate.

Conclusion

The study concludes that adult education lecturers in federal universities in South East are aware of climate change but that a lot more needs to be done to improve their awareness of global and national policies and initiatives to reduce climate change. The findings also indicate that male lecturers are significantly more aware of climate change than female lecturers. Additionally, the adult and non-formal education programmes and strategies elicited from the respondents will be useful for creating awareness on climate change among the populace.

Recommendations

Based on the findings of the study on some aspects of climate change mitigation responses that adult education lecturers were not aware of, the researchers recommend that environmental protection apologists should carry out more enlightenment campaigns designed to get people to redress or reduce the impact of climate in line with global/national guidelines, policies and stipulations for collective and maximum impact. Based on the finding that showed that male lecturers were more aware than female lecturers, it is recommended that more efforts should be made to involve women, perhaps get them involved in environmental conscious groups, do more social media enlightenment programmes, while women affairs department can make it mandatory for women groups such as academic women and women in universities to organize climate change enlightenment campaigns geared towards getting women to understand that they can do something to redress the threat climate change pose to humanity. Whereas organizing seminars, workshops, conferences and symposia ranked first in the list of identified

programmes and strategies for creating awareness and lecturers engage in these non-formal education programmes regularly, the study recommends that more of these activities should be organized with climate change as the main theme and that where it is not possible, it should be brought in as sub-theme. This will enable adult education lecturers engage in studies around climate change and thereby be richly educated and aroused to commit to reducing climate change.

Limitations of the Study

Restrictions in movement as a result of COVID-19 and the long strike embarked on by Academic Staff Union of Universities [ASUU] adversely affected the administration and retrieval of the instrument for the study. Even when google form was designed and shared in the affected departments' online platforms to augment the reach of hard copy questionnaire, the response was still poor. It seems many lecturers are still apathetic to the use of online forms. All these affected the number of responses used in the study's analysis. A more robust generalization would have been achieved otherwise.

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