

**KNOWLEDGE OF GLOBAL WARMING AND CLIMATE CHANGE ISSUES AMONG
PRE – SERVICE SOCIAL STUDIES TEACHERS’ IN OSUN STATE
COLLEGES OF EDUCATION**

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Abstract

This paper investigated the knowledge of climate change among pre – service social studies teachers in Osun State Colleges of Education. The study sought to find out whether variables such as gender and subject combination determine pre – service teachers’ knowledge of climate change issues. It adopted descriptive survey research design. A total of five hundred (500) pre – service social studies teachers were sampled for the study. Descriptive and inferential statistics were used in the analysis of data collected through the use of the questionnaire titled “Pre-service Teachers Knowledge of Climate Change Questionnaire” A reliability co-efficient of 0.88 was obtained using test –retest methods. The findings of this study showed that pre-service social studies teacher’s knowledge of climate change is above average. Also, there is no significant difference in the knowledge of climate change among female and male pre-service teachers of social studies in Osun State colleges of education. The study recommended that pre – service teachers’ should support the introduction of climate change and as a course of study in colleges. They should serve as agent of directing the student to voluntary actions that will reduce the problems of climate change, such as planting of trees. Also colleges of education should provide a good forum for the teaching and learning of climate change and other environmental issues. Lastly government should implement the backlog of already formulated educational policies that will favour mitigation of the effect of global warming and climate change.

Key words: Knowledge, Pre-Service Teachers, Climate Change, Global Warming, Mitigation.

Introduction

The knowledge of climate change has become a contemporary issue to all. According to Intergovernmental Panel on Climate Change (IPCC 2001), the warming of planet earth is largely attributed to increase of green house gases (primarily carbon dioxide and methane) in the earth's upper atmosphere caused by burning of fossil fuels, industrial and farming activities including deforestation activities. Oladiran (2000) also noted that human activities in most cases caused the change in any part of the structure of the earth and alter the atmospheric composition and climate on global scale.

In recent decades, environmental disasters such earthquakes, flooding, death, heat strokes among others which were climate change propelled were recorded across the world. Elize (2007) holds that climate change and environmental change processes lead to changes in bio physical life support system, including land surface, vegetation, water resources, soil and atmosphere which constitute the element support the long term sustainability of life on earth.

Ojo and Oladosu (2000) noted that the effect of man's activities on climate variation was perceived as negligible and so, climate was generally taken for granted and there was little thought that climate could be a problem with severe impact, but today, it affects the very basis of human existence. The incessant flooding, desert encroachment, frequent ocean surge and variation in weather conditions signal the effects of climate change.

Given the gravity of the effect or the consequences of climate change on the planet earth, the knowledge of the concepts, causes, consequences and their possible mitigation is inevitable in our colleges of education in Nigeria. However, it is pertinent to emphasize the role of pre-service teachers of social studies in controlling or mitigating the effects of climate change. This is because they also have potentials of disseminating the ideas and concepts associated with climate change whenever they become full fledged teachers.

A panel convened by the United State National Research Institute Council, the nation's premier science policy body, in June, 2006 voiced a 'high level of confidence' that earth is the hottest, it has been in at least four hundred (400) years, and possibly even the last 2,000 years. Studies indicated that the average global surface temperature has increased by approximately 0.5 – 1.0°F (0.3-0.6°C) over the 20th century. This was the largest increase and scientists are predicting an even greater increase in this 21st century.

This warming is largely attributed to the increase of green house gases (primarily carbon dioxide and methane) in the earth's upper atmosphere caused by human burning of fossil

fuels, industrial farming and deforestation activities. This leads to a state of global warming and in effect climate change.

Climate change and global warming are largely attributed to the increase of green house gases (primarily carbon dioxide and methane) in the earth's upper atmosphere caused by human burning of fossil fuels, industrial burning, farming and deforestation activities. (IPCC, 2001; Oladapo, 1995; King, Ogallo, and Ayamba (2000).

Other causes of global warming are natural causes such as volcanic eruptions which produce carbon dioxides. According to Manhan (2001) carbon dioxide is released into the atmosphere anthropogenically through burning of fossil fuels. Fossil fuels remain the most reliable and efficient source of energy in the world. Burning them produces carbon dioxide into the atmosphere and this happens daily in our factories, home and farmlands. 40% of the total carbon dioxide emissions come from burning of fossil fuels by automobiles and airplanes. (Agoumi, 2003).

Increase in the level of sea water, change in the pattern of precipitation, changes in the frequency and intensity of extreme weather events, Species extinctions, Health hazards, changes in agricultural yields/food shortage, increased temperature of the ocean and land, destruction of stratospheric ozone depletion, solar variation, flooding, heat stroke and poor air quality are identified as climate change variations resulting from the effect of global warming.

According to Lowe (2009) global warming mitigation involves taking actions to reduce green house gas emissions and to enhance sinks aimed at reducing the extent of global warming. He asserted that this is in distinction to adaptation to global warming which involves taking actions to minimize the effects of global warming and climate change issues.

Stern (2007) identifies several ways of mitigating climate change. This includes:

- Reducing demand for emission intensive goods and service
- Increasing efficiency gains
- Increasing use and development of low carbon technologies and
- Reducing non fossil fuel emissions

Other mitigations according to Lowe (2009) include government policy.

Among the policies includes emissions reduction strategies such as

- Carbon pollution reduction scheme
- The investment of energy in renewable energy technology and
- Demonstration of carbon capture and storage

- Actions on energy efficiency
- The renewable energy targets

A report by the Science daily (2010) titled “Large gap found in public understanding of climate change” states that 63% of Americans believe that global warming is happening, but many do not understand why.

According to Bamisaiye (1989), knowledge is central to education. She asserted that “one” cannot be a good teacher unless you have a good knowledge of the subject matter. She defined knowledge as “our intellectual encounter with an object, idea, person or event and our ability to internalize the intellectual encounter. Viewed from a wider perspective, the teacher is one who imparts knowledge and skills in formal and non formal educational setting. In the word of Olorisade (2000) “teachers are the ones that make or mar the growth and development of a nation through education. In this vein, the knowledge of the concept of climate change and related issues among pre service social studies teachers is imperative and need be examined. It is against this background that the researcher investigated the knowledge of global warming and climate change issues among pre-service social studies teachers in Osun State College of education, Ila and Ilesa.

Statement of the Problem

Global warming and Climate Change issues are eating deep into the fabrics of the nations’ economy. It is essential to note that human beings have been a major contributor to this phenomenon through uncontrolled activities such as burning of fossil fuels, industrial and farming activities including deforestation activities that increase green house gases in the earth’s upper atmosphere. There is thus the need to be educated on this matter.

To educate is to impart knowledge and knowledge is central to education. In fact, one cannot be a good teacher unless you have a good knowledge of the subject matter. If the menace of climate change is to be properly mitigated, there is the need to employ the services of teachers’ who from a wider perspective are viewed as responsible for imparting knowledge and skills in formal and non formal educational setting. This study therefore examined the knowledge of global warming and climate change issues among pre – service social studies teachers’ in Osun State colleges of education.

Research Questions

1. Are pre-service social studies teachers' aware of global warming and climate change issues?

Hypotheses

1. There is no significant difference in the knowledge of global warming and climate change among male and female pre-service teachers of Social Studies.
2. There is no significant difference in the knowledge of global warming and climate change among pre-service teachers with Social Studies/ Geography and Social Studies/Economics subject combinations.
3. There is no significant difference in the knowledge of global warming and climate change among pre-service teachers of Social Studies in Ila-Orangun and Ilesha Colleges of Education.

Method

Research Design

The study employed the descriptive survey research design. This is because variables in the study were not manipulated for the very reason that they have already occurred.

Population and Sampling Procedure

The population covered Pre-service Social Studies teachers of the two colleges of education in Ilesa. Purposive sampling technique was used to select 500 pre-service Social Studies teachers. These comprised 249 males and 251 female pre-service teachers with social studies subject combinations.

Instrument

The main research instrument used for the study was the self structured questionnaire titled "knowledge of global warming and climate change Questionnaire"

The questionnaire was divided into two sections. Section A elicited information on respondents' demographic data while Section B contained achievement test questions on respondents' knowledge of climate change and global warming. The reliability of the instrument was determined using test-retest method and reliability coefficient of 0.88 was obtained.

Results

The results of the study are presented as follows:

Research Question one

Are pre-service social studies teachers' aware of global warming and climate change issues?

Answers to this research question are obtained from results in Table 1.

Table 1 shows that 451(90.2%) of respondents are aware of global warming and climate change while 49 (9.8%) are not aware of global warming and climate change at all. This implies that there is a high level of awareness on climate change and global warming among pre – service social studies teachers.

Hypothesis 1: There is no significant difference in the knowledge of global warming and climate change among male and female pre-service social studies teachers.

Answers to this research hypothesis are obtained from table 2

From table 2, critical t. value is 1.960, cal-t=0.225, df = 498, at $P < 0.05$ level of significance. This implies that there is no significant difference in the knowledge of global warming and climate change among male and female pre-service social studies teachers. Therefore, the null hypothesis is accepted.

Hypothesis 2: There is no difference in knowledge of global warming and climate change among pre-service teachers with social studies/geography subject combination and social studies/economics subject combinations.

Answers to this research hypothesis are obtained from table 3

Table 3 shows that calculated t-value of 1.490 is lesser than the critical table value of 1.96 at $P < 0.05$ level of significance. Therefore there is no significant difference among pre-service teachers with social studies/geography and social studies/economics subject combinations. The null hypothesis is therefore not rejected.

Hypothesis 3: There is no significant difference in the knowledge of global warming and climate change among pre-service teachers of social studies in the two Colleges of education, in Osun State.

Answers to this research hypothesis are obtained from table 4

Table 4 shows that there is no significant difference in the knowledge of global warming and climate change among pre-service teachers of social studies in Osun State Colleges of Education, Ila-Orangun and Ilesa. (Critical-table value = 1.96, calculated t = 1.648, df =498, $P < 0.05$ level of significance).

Discussion of Results

Results showed that there is no significant difference in the knowledge of global warming and climate change among male and female pre-service social studies teachers in Osun state Colleges of Education, Ila-Orangun and Ilesa. This implies that the knowledge of global warming and climate change is not gender bias.

This finding is in consonance with Keinde (2010) and Odebiyi (2010) that there is no difference in male and female geography teacher's knowledge, perception and attitude to climate change.

Also, this study showed 90.2% high level of awareness against 9.8% low level of awareness on global warming and climate change. Therefore, there is an improvement in the level of awareness on the phenomenon as against the observation of Elize (2007) who reported that a large number of the public are not aware of the main causes of global climate change, its effects and mitigation.

However, Oderinde and Amosun (2009) maintained that a culture of sustainable development is grossly lacking not only among the illiterates in Nigeria, but also among the school children and students of higher institutions of learning. They opined that community based awareness and education, seminars, workshops be organized, teachers as well as student be trained so that they will train others. This study has shown that the Colleges of Education in Osun State has headed this call. Notwithstanding, more knowledge and awareness is desirable among pre-service teachers of social studies in Nigeria.

It is worthy of note that this study revealed that there is no significant difference in the knowledge of global warming and climate change among pre-service teachers with Social Studies/Geography and Social Studies/Economics subject combinations. This shows that the knowledge of global warming and climate change are evenly taught or imparted among the various subject combinations in Osun state Colleges of Education.

Result from this study has shown that the knowledge of global warming and climate change is not institution biased. The pre-service teachers of social studies in the two colleges have a fairly equal knowledge about the concept.

Conclusion

The study investigated the knowledge of global warming and climate change among pre-service Social studies teachers in Osun State Colleges of Education Ila-Orangun and Ilesa. The study found out that pre-service teachers level of awareness on global warming and climate change is above average. Also, gender, institution's location and subject combination do not have significant

difference on pre-service Social Studies teachers' knowledge of global warming and climate change issues.

Recommendations

Based on the findings of this study, the following recommendations are made:

Pre-service teachers' should support the introduction of climate change and global warming as a course of study in Nigerian colleges of education. They should serve as agents directing students' to voluntary actions that will reduce the problems of climate change, such as planting of trees, public awareness and Eco friendly activities. Colleges of education should provide a better forum for the teaching and learning of climate change, global warming and other environmental issues. Government should make adequate utilization of various researches carried out to provide solutions to climate change problems. Curriculum should be upgraded to include more environmental issues. Government should launch massive awareness on the causes, effects and mitigation of global warming and climate change. Government should sponsor researches institution and other agencies that can help provide adequate knowledge on global warming and climate change issues.

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Table 1: Respondents' awareness of climate change and global warming

Awareness of global warming and climate change	Frequency	Percentage
Yes	451	90.2
No	49	9.8
Total	500	100

Table 2: Male and Female Pre-service Teachers' Knowledge of Global Warming and Climate Change

Var.	No. of cases	Mean score	Std dev.	Df	Cal. T-test	Critical value	P	Remark
Males	249	16.4143	16.4143	498	0.225	1.96	0.822	NS
Females	251	16.4859	16.4859					

Table 3: Comparison Table for the knowledge of the Pre-service teachers with Social Studies/Geography and Social Studies/Economics subject combinations.

Subject combination	N	Mean	Std. dev.	Crit.t	Cal-t	Df	(P)	Remark
SOS/ECO	220	16.05	3.86	1.96	1.490	368	.137	NS
SOS/GEO	150	16.61	3.17					

Table 4: Knowledge of Pre service Teachers of Social Studies in Ila and Ilesa Colleges of Education

Colleges	N	Mean	Sd	Crit-t	Cal-t	Df	Level of sig	Remark
Ila-Orangun	250	16.1880	3.8590	1.96	1.648	498	.100	NS
Ilesa	250	16.7120	3.222					