CSCanada
Cross-Cultural Communication
Vol. 16, No. 2, 2020, pp. 33-38
DOI:10.3968/11670

ISSN 1712-8358[Print]
ISSN 1923-6700[Online]
www.cscanada.net
www.cscanada.org

Apraisal of Geography Teachers' Knowledge on the Relevance of Secondary School Geography Curriculum Relating to Climate Change in Nigeria

Samuel Olanrewaju Oladapo[a],*

[a]Lecturer, Adekunle Ajasin University, Akungba Akoko, Ondo, Nigeria.
*Corresponding author.

Received 7 March 2020; accepted 3 June 2020
Published online 26 June 2020

Abstract

Evidence shows that climate change is experienced all over the globe. Climate change is defined as a change in the state of the climate that can be identified and measured by changes in the mean and/or variability of its properties Climate change can persist over a long time, usually over decades and much longer and leads to extremes of weather conditions such as temperature, wind, rainfall, and humidity. Geography curriculum is basically on climate and environment generally The main purpose of the study is to explore geography teacher's knowledge, attitude and the practices relating to climate change in Nigeria. Questionnaire on the knowledge of climatic change among geography was used as the main instrument for data collection. It was designed to elicit information on the basis of research questions set for this study. A total number of 60 geography teachers were used as the sample size. Descriptive statistics such as simple percentages and frequency counts were used in the analysis of the research data collected. The findings from the research work show among others that the teachers communicate effective on the topics relate to climate change. It also reveals that most teachers have knowledge of the contents of geography curriculum. Geography teachers according to the findings indicates the readiness of the teachers to continue teaching the topics relating to climate change. It is therefore, recommends that topics on climate change be made compulsory for students at all level of education.

Key words: Climate change, geography teachers, teachers' attitude, knowledge

Oladapo, S. O. (2020). Apraisal of Geography Teachers' Knowledge on the Relevance of Secondary School Geography Curriculum Relating to Climate Change in Nigeria. *Cross-Cultural Communication, 16*(2), 33-38. Available from: http//www.cscanada.net/index.php/ccc/article/view/11670
DOI: http://dx.doi.org/10.3968/11670

BACKGROUND OF THE STUDY

Education and the general dissemination of climate change knowledge has traditionally been of low priority globally (OECD, 2009). However, more recently, adaptation has come to be considered crucial within the broader context of sustainable development and within this space there has been an increasing recognition of the need to improve climate change awareness and education to enhance the capacity of people and communities to adapt to climate change (UNFCCC, 2014). Geography teachers play an important role in promoting climate change literacy in schools, but not much is known about which of their characteristics significantly influence students' climate change literacy.

The climate change is described as any kind of change in climate that may be natural or human induce, resulting to deviation in normal adopted weather condition (Union of Concerned Scientist, 2012).

Climate change as defined by Ekpoh (2009) is any long-term change in the patterns of average weather of a specific region. This abnormal weather condition may occur over a period of years. Report of (IPCC, 2000) shows that global mean temperature is noticed to increase by 0.60 Degree Celsius. During the past century, having the hottest years occurring between 1999 and 2007, this is being informed through the global warming cushioned by the high concentration of Carbon (IV) oxide and other fossil fuel combustion and deforestation. These by extension have consequences on the earth in the form of significant variations in the regional climate, excessive heat waves, windstorm and so on.

Evidence shows that climate change is experienced all over the globe. Climate change is defined as a change in the state of the climate that can be identified and

measured by changes in the mean and/or variability of its properties (Intergovernmental Panel on Climate Change, (IPCC), 2007). Climate change can persist over a long time, usually over decades and much longer and leads to extremes of weather conditions such as temperature, wind, rainfall, and humidity (Ayoade, 2003). The consequences of climate change impact the environment, health, agriculture, and transportation. Heat waves and wildfires have made life unbearable for both the human population and wildlife. This situation is particularly precarious in the hot regions of the world.

Oakes and Saunders (2002) highlight that often teachers impart their knowledge in conjunction with the information provided in textbooks or other resources when teaching about a topic. Some teachers encourage students to openly enquire about topics being covered in class. Thus, in this instance, teachers become a guide or "resource' for students', in sharing their understandings and helping learners gain insight into subject matter. As a result, teachers have a major influence over learners' conceptualisations of a topic. This point is emphasized by Khalid (2003) who highlights that if educators hold inaccurate understandings and perceptions regarding a topic, it is quite likely that they will pass on these misconceptions to their learners in the classroom.

The Intergovernmental Panel on Climate Change (IPCC) have reported on successive occasions irrefutable evidence of increased atmospheric and ocean temperatures, causing increased melting of snow and ice and a resulting rise in sea levels (IPCC, 2014). This rise in global temperatures is attributed largely to greenhouse gas emissions from fossil fuel consumption and it is expected that a continued and increasing rise in temperatures will occur (IPCC, 2014). Under these conditions, capacity to deal with the consequences of climate change, or our abilities of 'adaptation' have become central to policy responses globally. An individuals or communities capacity to adapt to these changes becomes central to mitigating and adapting to the effects of climate change. Climate change education is seen as a valuable tool to increase climate change awareness and adaptive capacity in society broadly (UNFCCC, 2014).

The research community has concluded that climate change represents an urgent threat to human and natural systems (The Intergovernmental Panel on Climate Change, IPCC, 2014) and that an effective and immediate response to climate change is required to prevent hazardous human interference with the climate system (IPCC, 2014). IPCC has highlighted the necessity of countries, companies, communities, and individuals worldwide to participate in climate change mitigation, which is defined as human intervention to reduce the sources or enhance the sinks of greenhouse gases. On the basis of the scientific perspective on climate change, represented by the IPCC reports, the first-ever global agreement on limitation of global temperature rise was adopted at the Paris climate conference in December, 2015 (United Nations Framework Convention on Climate Change, 2015).

Climate change is geographic in nature because it results from interactions between the Earth's natural complex systems and anthropogenic influences (IPCC, 2014; National Ocean and Atmospheric Administration (NOAA, 2011). Developing and understanding the systems and processes that result in climate change, and its impacts, and different ways of responding to it through Geography, will involve the organisation of geographical knowledge around the concept of place, spatial processes, spatial distribution and humans and the environment (Department of Basic Education, 2011), which are relevant in the development of climate change literacy. In the preface to his book, teaching secondary geography as if the planet matters, Morgan (2012) stresses that the true worth of a school subject is revealed in the extent to which it accounts for, and responds to, the major issues of the time. Under the circumstance of the visible impacts of climate change on natural and human systems, the mere ability to encode and decode text information, which is the standard for distinguishing the literate from the illiterate, may not be adequate to understanding, and responding to, climate change; rather, it may require literacy in the contemporary sense, which refers to a flexible group of competencies needed to succeed in today's rapidly changing world (Holbrook and Rannikmae, 2009).

The factors that make climate change education challenging are many and varied. They include the multidisciplinary nature of climate science, which makes explanation of the nature of the Earth's climate systems and the processes that occur in it complicated the diverse conceptions that people, including teachers and learners, hold about climate change are inconsistent with scientific accounts of climate change a scarcity of people with expertise in the science that supports climate change mitigation and adaptation and the emotions and anxiety associated with the direct impact of climate change on people and their livelihoods, particularly the most vulnerable in society, including children, women and the disabled.

With this exposition, the factors that make the implementation of climate change education challenging revolve around two main problems: literacy in climate change science and literacy in climate change pedagogy. Science is a human endeavour that deals with and seeks understanding of the natural world. It is against this backdrop that the researcher is interested in investigating survey of Social Studies teacher's knowledge attitude and the practices relating to climate change in Akungba town, Ondo State.

PURPOSE OF THE STUDY

The main purpose of the study is to explore geography teacher's knowledge, attitude and the practices relating to climate change in Akungba town, Ondo State. Specifically, the study seeks to:

• Determine the level of the knowledge of geography teacher toward climate change

• Examine the geography teacher's attitude toward climate change

• Determine the geography teacher's practices in relation to climate change

Research Questions

From the foregoing, this study intends to answer the following research questions.

• What is the level of the knowledge of geography teacher toward climate change?

• What is the attitude of geography teacher toward climate change?

• What is the geography teacher's practice relating to climate change?

SIGNIFICANCE OF THE STUDY

The outcomes of this study will help develop an understanding of the literacy status of Geography teachers in relation to climate change science and climate change pedagogy. This understanding could be useful to policymakers in reviewing and revising existing policies on climate change and Geography education. Insights gained from this study may enable curriculum developers to design and implement professional development intervention programmes for teachers and teacher educators, to enhance their literacy in the science and pedagogy of climate change with the aim to improve the quality of climate change education in schools.

The outcomes of this study hopefully will make substantial and original contributions that build significantly on many different research interests in terms of theory, research, practice and policy on climate change education.

Notwithstanding this study's claim that constructivist teaching principles are suitable for educating learners about climate change, geography teachers have the freedom to select and apply the principles of other pedagogies that could facilitate the teaching and learning of climate change concepts and issues in schools.

Scope of the Study

The geographical scope of the study was limited to secondary schools in Akungba town, Ondo State. The content scope covered the level of the knowledge of geography teacher toward climate change, attitude of geography teacher toward climate change and geography teacher practice relating to climate change

Method

The research was a descriptive research of a survey type in which questionnaire was used to elicit information from the sample selected to generalize on the population.

The population for this study comprises of public secondary schools' geography teachers in Ondo State.

The sample for this study comprises of 60 geography teachers that were randomly selected from public secondary schools in Akoko area of Ondo State.

The research instrument "Teacher's Knowledge, Attitude and the Practices to Climate Change Questionnaire (TKAPCCQ)" was used to collect data for the study. The questionnaire is of two sections: Section A and B. Section A contains the demographic information of the respondents; while section B contains 15 items drawn out from variables indicated in the research questions and hypothesis. The responses of the items were based on a four point likert scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD).

Results

The data collected on Geography Teacher's Knowledge, Attitude and the Practices to Climate Change Questionnaire (TKAPCCQ) as rated by geography teachers to answer research questions using frequency counts, simple percentages and mean scores to calculate the data collected from the geography teachers in Ondo town and Akoko South West Local Government Area of Ondo State. Thus, any mean below 2.50 is regarded as low, between 2.50 and 3.50 is moderate while above 3.50 is high.

Research Question 1: What is the level of the knowledge of geography teacher toward climate change?

Table 1
Analysis showing the level of the knowledge of geography teacher toward climate change

S/N	Items		Response				
			SA	A	D	SD	$\bar{x}$
1	I can communicate accurately about climate change	F	27	32	-	1	3.42
		%	45	53.3	-	1.7	
2	I have the sound knowledge of any topic I teach on issue of climate change.	F	16	36	7	1	3.12
		%	26.7	60	11.7	1.7	
3	Teachers were found to be unaware of the proper actions for the climate change	F	6	24	26	4	2.53
		%	10	40	43.3	6.7	
4	Teachers' awareness on environmental issues are inadequate due to lack of training an re-training	F	11	32	11	6	2.8
		%	18.3	53.3	18.3	10	
5	Teachers' has adequate content knowledge of topics on climate change	F	11	33	11	5	2.83
		%	18.3	55	18.3	8.3	
	Grand Mean				2.94		

Key: SA- Strongly Agree, A- Agree, D-Disagree, SD- Strong Disagree
Source: Field Work, 2019.

Table 1 showed the level of the knowledge of geography teacher toward climate change in Ondo town and Akoko South-West Local Government Area of Ondo State. The result showed that 93.3% of the teachers can communicate accurately about climate change while 1.7% disagreed with the statement. Similarly, 86.7% of the teachers agreed that they have the sound knowledge of any topic they teach on issue of climate change while 13.4% disagreed. 71.6% agreed that teachers' awareness on environmental issues is inadequate due to lack of training and re-training while28.3% disregard that statement. Also, 73.3% of the respondents agreed that teachers have adequate content knowledge of topics on climate change while 26.6% disagreed with the statement.

It can be inferred that the teachers can communicate accurately about climate change, they have the sound knowledge of any topic they teach on issue of climate change.

Research Question 2: What is the attitude of geography teacher toward climate change?

Table 2
Analysis showing the Attitude of Geography Teacher toward Climate Change

S/N	Items		Response				
			SA	A	D	SD	$\bar{x}$
6	I don't feel really concern about climate change.	F	7	17	26	10	2.35
		%	11.7	28.3	43.3	16.7	
7	I guide in solution of various problems to climate change	F	13	33	11	3	2.93
		%	21.7	55	18.3	5	
8	I don't need to teach climate change if not in the syllabus	F	9	13	31	7	2.4
		%	15	21.7	51.7	11.7	
9	I don't have to border myself on the issue of climate change if government like they should handle it	F	8	21	21	10	2.45
		%	13.3	35	35	16.7	
10	Teachers display enthusiasm when teaching climate change	F	15	31	10	4	2.95
		%	25	51.7	16.7	6.7	
	Grand Mean				2.62		

Key: SA- Strongly Agree, A- Agree, D-Disagree, SD- Strong Disagree
Source: Field Work, 2019.

The analysis on Table 2 showed that 40% of the teachers agreed that they don't feel really concern about climate change while 60% disagreed with the statement. Also, 76.7% of the teachers agreed that they care in providing solution to various problems confronting climate change while 23.3% disagreed with the statement. Similarly, 36.7% of the teachers agreed that they don't need to teach climate change if not in the syllabus while 63.4% disagreed with the statement. Furthermore, 76.7% agreed that teachers display enthusiasm when teaching climate change while 23.4% disagreed with the statement.

Research Question 3: What is the geography teacher's practice relating to climate change?

Table 3
Analysis showing the geography teacher's practice relating to climate change

S/N	Items		Response				
			SA	A	D	SD	$\bar{x}$
11	I burn my refuse in order to clean my environment	F	14	19	22	5	2.7
		%	23.3	31.7	36.7	8.3	
12	I can't plant trees in my compound because it leave can cause environment dirty	F	9	15	26	10	2.38
		%	15	25	43	16.7	
13	Teachers' has a wide range of teaching skills on climate change	F	15	30	11	4	2.93
		%	25	50	18.3	6.7	
14	I teaches my students regularly on climate change even when it is not in the topic been taught.	F	11	36	11	2	2.93
		%	18.3	60	18.3	3.3	
15	I give advice to my students on the problem of climate change	F	14	38	7	1	3.08
		%	23.3	63.3	11.7	1.7	
	Grand Mean		2.80				

Key: SA- Strongly Agree, A- Agree, D-Disagree, SD- Strong Disagree
Source: Field Work, 2019.

As indicated in Table 3, 55% of the teachers agreed that they burn their refuse in order to clean environment, while 45% disagreed. The result further revealed that 75% agreed that teachers has a wide range of teaching skills on climate change while 25% disagreed with the statement. Similarly, 78.3% of the teachers agreed that they teach

students regularly on climate change even when it is not in the topic been taught while 21.6% disagreed with the statement. It also indicated that 86.6% of the teachers agreed that they give advice to students on the problem of climate change while 13.4% disagreed with the statement.

It is therefore inferred that teachers burn refuse in order to clean environment, they have a wide range of teaching skills on climate change, and give advice to my students on the problem of climate change. *The grand mean value of 2.80 indicated that* geography teacher's practice relating to climate change is moderate

SUMMARY

This study examines geography teacher's knowledge, attitude and the practices relating to climate change in Ondo State. Three research questions were raised to guide the study. The research design adopted for the study was descriptive research of the survey type. Simple random sampling technique was used to select 60 geography teachers. One instrument was used for data collection: Teacher's Knowledge, Attitude and the Practices to Climate Change Questionnaire (TKAPCCQ). The data collected were analysed using descriptive statistic. Frequency count, simple percentage and mean scores were used to answer the research questions.

CONCLUSION

Climate change is not only caused by natural forces alone; human activities are known to fuel impact of climatic change. It is important that the trends in teachers' knowledge and perceptions of climate change are sufficiently addressed so as to ensure the ultimate success of climate change education in schools. To this end, first of all, teachers' behaviors, perceptions, and awareness are vital to be increased. Besides, the majority of teachers are unfamiliar in how to educate their students about issues such as climate change since they heavily based their teaching on traditional didactic strategies. It is on this note that topics on climate change should be integrated into the secondary school curriculum, while teachers should be prepared through training and re-training to handle this new content.

RECOMMENDATIONS

Based on the findings and conclusions drawn from this study, the following recommendations are made.

• A workshop should be organized for teachers of secondary schools to enable them have a better understanding to cope with the menace of climate change. This will equip them for classroom delivery.

• The policymakers should consider continuing education interventions that will enable Geography teachers to develop deeper scientific knowledge and understanding of climate change, such that they will be able to promote the development of climate change science literacy in schools.

• The stakeholders should make arrangement ahead of time on how to handle the effects of climate change.

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