

Social Studies Curriculum Response To Climate Change: The Views Of Social Studies Teachers In Public Senior High Schools In The Cape Coast Metropolis

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ABSTRACT:

In the 21st century, scientists and climatologists have raised a lot of concerns about the world's climate. Climate change is one of the major challenges in recent times and adds considerable stress to societies and to the environment. The search for lasting solution(s) to this menace is (are) still on course. The use of education has been found to be instrumental in addressing the challenges posed by climate change. This study, therefore, sought to find out the extent to which the Social Studies curriculum which is one of the common core integrated subjects in Ghana has responded to climate change issues. The study was conducted in public Senior High Schools in the Cape Coast Metropolis of Central Region in Ghana. In all, 79 Social Studies teachers in the selected Senior High Schools were used for the study. The study is a descriptive survey and data were collected using questionnaire designed in Likert-type scale. Data collected were analysed and presented using frequency counts and percentage tables. It was evident from the study that the response of the Social Studies curriculum at the senior high school (SHS) level to climate change is not enough for students in the SHS to internalise the concepts, attitudes and skills that are expected to transform and shape the disposition of learners on climate change. It became evident that the curriculum may require a redesign to include more topics on climate change issues. It was thus, recommended that the rich knowledge of the teachers both in pedagogy and climate change should be tapped when redesigning the SHS Social Studies curriculum to respond to climate change in the country.

Key words: Social studies, climate change, curriculum, pedagogy

INTRODUCTION:

The World Meteorological Organisation (WMO) defines 'climate' as the total effect of the interaction between temperatures, humidity, precipitation, winds, radiation, and other meteorological conditions characteristic of a locality or region over an extended period of time (IPCC, 2007). In the 21st century, scientists and climatologists have raised a lot of concern about the world's climate. They have argued that the climate has changed over the past few decades and in effect has generated a lot of international debate as to how this global threat which is new and infant in the literature can either be mitigated or adapted. Several works have been done by international bodies such as United Nations (UN), Intergovernmental Panel on Climate Change (IPCC), United Nations Educational, Scientific and Cultural Organisation (UNESCO), United Nations Framework Convention on Climate Change (UNFCCC), National Research Council (NRC) among others.

For most people, the expression "climate change" means the alteration of the world's climate that we humans are causing, through fossil fuel burning, clearing forests and

other practices that increase the concentration of greenhouse gases (GHG) in the atmosphere. This is in line with the official definition by the United Nations Framework Convention on Climate Change (UNFCCC) that climate change is the change that can be attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (UNFCCC, 2007).

Climate change encompasses all forms of climatic inconsistency (that is, any difference between long-term statistics of the meteorological elements) and it is believed to have implications for sustainable development. Scientists believe that a warmer Earth may lead to changes in rainfall patterns, a rise in sea level caused by slow melting of polar ice, and a wide range of impact on plants, wildlife and humans. The report by the world's top climate scientists (Shi, 2008) indicates that global warming was very likely man-made and would bring higher temperatures and a steady rise in sea levels for centuries to come regardless of how much the world slows or reduces its greenhouse gas

emissions. Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global mean sea level (Chen, 2006).

Climate change is a key priority for international development as its impact is likely to be disproportionately felt in developing countries. Climate change will affect all countries, but people in the poorest countries and poor people in richer countries are more likely to suffer the most. They tend to live in high-risk areas such as unstable slopes and flood plains, and often cannot afford well-built houses. Many of them depend on climate-sensitive sectors, such as agriculture, and have little or no means to cope with climate change, for example owing to low savings, no property insurance and poor access to public services. Climate change is expected to reduce already low incomes and increase illness and death rates in many developing countries. Africa, small island states, and the Asian and African mega-deltas are likely to be particularly affected by climate change (Stern, 2007).

According to the IPCC (2007), Africa is particularly vulnerable to the effects of climate change because of multiple stresses and low adaptive capacities, arising from endemic poverty, weak institutions, and complex disasters and associated conflicts. Drought will continue to be a primary concern for many African populations. The frequency of weather and climate-related disasters has increased since the 1970s, and the Sahel and Southern Africa have become drier during the twentieth century. Water supplies and agricultural production will become even more severely diminished. By 2020, in some African countries, agricultural yields could be reduced by as much as 50%. By the 2080s, the area of arid and semiarid land in Africa will likely increase by 5-8%. This is because developing countries are generally warmer, more prone to rainfall variability, more dependent on agriculture -the most climate-sensitive of economic sectors -and as a result of low income have limited risk mitigation infrastructure, both physical and financial (e.g. insurance) (Stern, 2007).

Furthermore, increased instances of drought, flooding and severe weather events as well as incremental environmental change through processes such as inundation, desertification and salination are likely to exacerbate existing problems related to agricultural production, communicable diseases, migration streams, poverty and conflict (Bangay & Blum, 2010; Smith & Vivekananda, 2007; UNICEF UK, 2008; WHO, 2008).

Consequences for the majority of people in Asia and Africa as well as those living in Small Island Developing States (SIDS) are likely to be particularly significant, although the specific nature of climate threats will vary between countries. Climate change presents an international

challenge of a magnitude not previously encountered. Its impacts have the potential to exacerbate existing tensions and create new ones, which, in turn, have implications for stability and security at a local and international level. An effective response to climate change and its associated biophysical and socio-economic impacts will therefore need to be multifaceted and inherently political. Thus, the concept of climate change has attracted global concern and the schools have been charged with transmission of knowledge and skills needed by students to prevent climate change (Meng, 2009). Several countries have made strenuous efforts to include issues on climate change as part of their curriculum. This is because schools serve as places that assist students in developing understanding of society, resources, climate and climate change and also to show commitment to reducing or preventing climate change.

Since 1990, China has provided compulsory education on climate change for the world's population from pre-school level to the tertiary levels of education. The Chinese government has adopted climate change action plans which include specific education initiatives. Knowledge about climate change will be included in basic, higher and adult education with a focus on awareness and participation in relevant activities (Yi & Wu, 2009).

China has formulated and implemented a national plan for coping with climate change and adopted series of policies and measures in this regard. China combines the handling of climate change with its execution of its sustainable development strategy, acceleration of buildings, a resource-conserving and environmental-friendly society and construction of a country of innovation (Yi & Wu, 2009). This implies that China's development agenda incorporates climate change issues in the execution of projects.

Similarly, in the Canadian Province of Newfoundland and Labrador, there has been a Climate Change Action Plan since 2005, which emphasises Climate Change Education. In this Province, the origin of the action plan may be attributed to the clearly visible local effects of climate change (Nazir, Pedretti, Wallace, Montemurro, & Inwood, 2009). Newfoundland and Labrador was one of the first jurisdictions in Canada to develop policy to directly address the issue of climate change. The Climate Change Action Plan (2005) is described as complementary with the government's ongoing policy objectives and commitment to sustainable development. Newfoundland and Labrador's Department of Education has developed several policies to foster the implementation of Education for Sustainable Development and Climate Change Education in schools. One major initiative is the reorientation of existing educational programmes to incorporate concepts related to sustainability.

Again, the Danish government's 2009 Education for Sustainable Development (ESD) strategy also launched a number of specific initiatives concerning Climate Change Education. New Climate Change Education initiatives under the rubric of Environmental Education and Education for Sustainable Development can likewise be found in other countries (Breiting, Jeppe, Rolls & Karsten, 2009). The Danish government described sustainable development as a challenge which will require an integrated approach and broad participation.

In South Africa, the development of knowledge and understanding of climate change and the use of natural resources resides largely in the Social Science and Natural Sciences Learning Areas. Both learning areas expect learners to develop critical skills in order to make wise use of natural resources. In Ghana, the threat of climate change is not new. There have been national calls to reduce human activities, especially, the burning of fossil fuels (e.g. coal and oil) which intensify climate change (Evans, 2004). These national calls can only be successful if Ghana can make conscious efforts to utilise the principles of environmental education and education for sustainable development to structure holistic curriculum content on climate change.

It is said that any attempt to make the concept climate change a curricular issue unavoidably comes with its own challenges. This is because, society is not prepared to respond to climate change because the climate-related decisions and policies that need to be made over the next decades will require a citizenry that is better informed and more engaged than it is today (NRC, 2010a). History shows that society has successfully coped with and adapted to the existing relatively stable climate variability; the challenge now is to respond effectively to the threats presented by climate change (NRC, 2010b). Again global climate changes are complex and challenging to communicate to society. An understanding of science is fundamental to appreciating the forces that produce climate change and the effect of changing climate on different regions of the world.

It appears science education is not available to everyone and scientists and educators, in general, lack sufficient capability to translate sciences to lay audiences. This situation makes it difficult for people to become informed or educated about climate science. As a consequence, society lacks the knowledge and skills to modify its behaviours to adapt to the effects, or mitigate climate change. Greater awareness or knowledge about climate change may lead to a more engaged citizenry (Kahlor & Rosenthal, 2009), but only if special attention is directed to the cultural diversity of our audiences when tailoring messages aimed at generating a sense of urgency and being a cue to act (Kahan, Wittlin,

Peters, Slovic, Larrimore Ouellette, Braman & Mandel, 2011).

In the words of Hamilton (2008), public opinion about climate change is largely influenced by political preferences. Sometimes, it appears that political orientation is a stronger determinant of attitudes towards climate change than other demographic attributes. The politicisation of the debate on climate change has led members of the public to perceive it more as a matter of personal opinion or a political ideology, distracting attention from the known facts about climate change and the basic causes of those changes (Furman, Roncoli, Crane, Paz, & Hoogenboom, 2009). Consequently, there is an acute and demonstrable need to better educate and inform decision-makers and citizens in general on the most basic facts of climate change (Hassol, 2008), so as to develop a more climate science literate society.

The chronic shortage of scientific knowledge and expertise around climate change and its impact in many developing countries are also a key concern for educators and policy makers at both secondary and tertiary levels. The level of incorporation of climate change issues will vary greatly depending on the level of education, and the local and national contexts being addressed. In primary education, for instance, a core concern is when to introduce the issue of climate change. This decision is important in order not to frighten children and young people, but to empower them to understand and critically engage with environmental change. In secondary education, tensions exist between a centralised curriculum and the need to promote locally based and locally appropriate knowledge on climate change.

Overloaded curricula frequently present additional challenges in mainstreaming climate change issues into the Social Studies curriculum. Identification of the most appropriate issues and areas of knowledge will require cooperation between local, national and international actors. Educators at all levels will also need support and training to deliver quality education about complex, climate related topics in ways which are both relevant to local, environmental, social and political contexts, and which meet wider educational targets e.g. literacy, numeracy, employability (UNESCO, 2012).

At present, climate change education is still a peripheral topic in both educational research and practice. In research literature, climate change education has been addressed almost exclusively as a domain of science education. Within the realm of practice, climate change is situated within environmental education and education for sustainable development, a minor theme within a peripheral area of the curriculum. Although the role of education in addressing the challenges of climate change is being increasingly recognised, the capacity of education to contribute to adaptation and mitigation measures has yet to penetrate

mainstream development thinking. In practical terms, the integration of climate knowledge and skills into existing education systems represents both immediate and longer-term challenges for responding to climate change (UNESCO, 2012).

Although a number of subjects such as Integrated Science and Geography have been introduced into the SHS curriculum in Ghana for the purpose of teaching students to address changes in society including climate change (Ghana Education Service, [GES] 1987), it is the Social Studies education with its integrative and incorporative nature [integrating other social science disciplines], that has been acknowledged as a major vehicle in promoting effective knowledge about climate change among Ghanaian students (Evans, 2004). Social Studies education provides students with diverse knowledge about the social and natural environment by developing the knowledge and understanding of students on the society and the use of natural resources.

Despite education on climate change through Social Studies curriculum, the problem of climate change still remains. At the Senior High School level (SHS), the courses which have link with climate change and can likely make a significant impact on the climate change debate are Social Studies and Integrated Science since they form part of the common core curriculum in Ghana's educational system. The Social Studies curriculum in Ghana which span three years has three main sections: 1) Environment; 2) Governance, Politics and Stability; 3) Socio- Economic Development (GES, 2010). Some of the topics studied in the third year under the broad section of Environment include the Ecosystem, Physical Environment and Human Activities, the Influence of Climate, Rainfall, Land and Environmental Degradation, The Green House Effect, the Challenges of Mining and Conservation of Environment. Although the students are introduced to some concepts of climate change at this level of their education, it appears there is no continuity in the subsequent years. Besides, the third year in which these aspects of climate change is taught, is an examination year and the students attention and time are taken up by six or seven other subjects which have to be passed if the student is to progress to the next stage of the educational ladder. Moreover, the third year is not a full academic year since the WASSCE examinations start in the first quarter of the year. Similarly, in the Integrated Science syllabus, issues of climate change can also be found in the theme Interaction of Matter which includes topics such as ecosystem, human activities and their effects on the atmosphere, major sources of atmospheric pollutants and their effects, greenhouse effect and climate change, desertification, drought, melting of ice and polar ice caps, rising sea levels, causes and effects of the depletion of the ozone layer and tectonic movements. Although there is

evidence of exposure of students to issues of climate change at this level, the challenge is that there is little reinforcement of the issues raised in the subsequent years of study. This generates a great concern on whether Social Studies, for instance, merits its introduction in the Ghanaian education system or not. The issues also seem to border on the views of teachers on the responses Social Studies curriculum has towards climate change. This is because the teachers' views will to some extent inform curriculum designers and policy makers as to what to incorporate into the existing curriculum.

Statement of the Problem

Social Studies education at the SHS level has been acknowledged as one of the subjects that are in tune with environmental issues including climate change. In this regard, it is expected that such a curriculum that is poised in dealing with environmental challenges will highlight more topics on climate change. However, it appears the curriculum effort is not enough in addressing climate change in the Social Studies curriculum at the SHS level. Athman and Monroe (2004) support this view when they state that interdisciplinary efforts to combat climate change have not been too successful in the formal education sector (Athman & Monroe, 2004).

Again, the chronic shortage of scientific knowledge and expertise around climate change and its impact in many developing countries are also a key concern for educators and policy makers at both secondary and tertiary levels of education. It appears there is little provision in the existing Social Studies curricula to address moral issues, human behaviour, and attitude, and teachers' views: the core of all problems to climate change, hence the need for this research. The views of Social Studies teachers are particularly relevant for this research in the sense that in curriculum implementation, the teachers are the foot soldiers in terms of the content and learning experiences that learners are made to go through in the process of learning. Ghana's hope for successful climate change initiatives hinges on Social Studies curriculum frameworks that is grounded on the values and principles of education for sustainable development and provides an opportunity to utilise the principle of education for sustainable development to structure a curriculum response to combat climate change. There seems to be gaps in studies regarding climate change in Social Studies curriculum at the SHS level. Hence, the choice of the topic to fill these gaps.

Purpose of the Study

The main purpose of this study was to solicit teachers' views on the extent to which Social Studies curriculum responds to climate change. Specifically, the study was to investigate the extent to which Social Studies curriculum respond to climate change and also to find out the

challenges Social Studies education face in responding to climate change.

Methodology

The study was a descriptive survey. In all, 79 Social Studies teachers in 10 public Senior High Schools (SHS) in the Cape Coast Metropolis made up the population for the study (census). Self-developed questionnaire based on Likert-type scale was used to collect relevant data from the respondents. The instruments were validated by three lecturers in the Department of Arts and Social Sciences Education in the University of Cape Coast, Ghana. A Cronbach’s alpha of .88 was established for all sections of the questionnaire. Frequency counts and percentages tables were used to analyse the data to answer the research questions.

Research Questions

The following research questions guided the direction of the study:

1. To what extent does the Social Studies curriculum respond to climate change?
2. What do teachers perceive as challenges Social Studies education face in responding to climate change?

Research Question 1: *To what extent does the Social Studies curriculum respond to climate change?*

This research question was set to find out the extent to which the Social Studies curriculum (syllabus) is in tune with current global climatic issues. That is, whether the Social Studies curriculum responses appropriately to climate change from the perspective of the Social Studies teachers. For this reason, the questionnaire contained items that elicited the teacher’s opinions on this issue. The results have been collated in Table 1.

Table 1: Social Studies Curriculum Response to Climate Change

Statement	Not At All No (%)	Not Sure No (%)	Some- how No (%)	To a large Extent No (%)	Total No (%)
The Social Studies curriculum is addressing climatic issues.	6 (8)	0 (0)	54(68)	19 (24)	79(100)
The Social Studies curriculum is helping teachers to handle climatic issues sufficiently.	6 (8)	12 (15)	43 (54)	18 (23)	79(100)

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Table 1 continued.

The Social Studies curriculum is increasing students’ knowledge on climate change.	4 (5)	7 (9)	41(52)	27 (34)	79(100)
The Social Studies curriculum is positively changing students’ views about climate change.	2 (3)	19 (24)	36 (45)	22 (28)	79(100)
The Social Studies curriculum should be redesigned to better handle issues of climate change.	1 (1)	5 (6)	19 (24)	54 (69)	79(100)
The Social Studies curriculum would better respond to climate change if it is designed by the teachers themselves.	7 (9)	29 (37)	18 (23)	25 (31)	79(100)
The Social Studies curriculum would better respond to climate change if we use foreign Social Studies curriculum or books.	44 (56)	18 (23)	11 (14)	6 (7)	79(100)

Field data, 2014

From Table 1, majority of the teachers 54 (68%) believed that the Social Studies curriculum is somehow addressing climatic issues. The respondents rated the curriculum as somehow 43 (54) helping teachers to handle climatic issues and somehow 41(52) increasing students’ knowledge on climate change. The choice of the word to somehow implies that the curriculum is not fully

equipping the youth (learners) on the issues of climate change. The overall response in Table 1 is in tandem with the responses presented in Table 2.

In the SHS level in Ghana, Social Studies is the subject that is well-positioned with the possibility to equip every student who goes through second cycle education with requisite knowledge in social and environmental issues. However, it appears this is not the case. In order to further assess the extent to which the SHS Social Studies curriculum responds to climate change from the perspectives of the teachers as observed in the syllabus (GES, 2010), an open-ended item on the questionnaire required teachers to state topics in the Social Studies syllabus that addresses climate change. Their responses were collated and presented in Table 2.

Table 2: Topics in Social Studies that Addresses Climate Change

Topic	No.	%
Our Physical Environment and Environmental Challenges.	66	83
Resource Development.	4	5
Sustainable development.	3	4
Science and Technology.	3	4
Population Growth and Development.	3	4
Total	79	100

Field data, 2014

In all, there are a total of 23 topics in the SHS Social Studies syllabus, GES (2010). From Table 2 above, out of the 79 teachers involved in this study, an overwhelming majority of 66 (83%) indicated that Our Physical Environment and Environmental Challenges appears to be the only topic that cover some elements of climate change in the syllabus. The remaining 13 (17 %) of teachers rather considered topics such as Resource Development, Sustainable development, Population Growth and Development, Science and Technology to be those that have climate change issues. My personal observation is in tandem with the majority in Table 2. A keen analysis of the Social Studies syllabus depicts its lack of intensive touch on climate change. There is no particular topic on climate change alone. As rightly portrayed by most of the teachers, it is only Our Physical Environment and Environmental Challenges that superficially treats aspects of climate change. This is highly inadequate and makes the call that one of the fundamental ways through which the younger generation can internalise issues of climate change is Social Studies education to make them climate sensitive and ensure sustainable future might not be realised.

The ill-responsiveness of the Social Studies curriculum to climate change in Ghana confirms the report by Laessoe, Schnack, Breiting and Rolls (2009) that climate change education is still in its infancy. Notwithstanding this assertion, some countries have made impressive moves towards the inculcation of climate change issues into their

educational systems. The Chinese government, for example, was one of the first countries to formulate and carry out a strategy for sustainable development and adopted climate change action plans after the United Nations Conference on Environment and Development in 1992. On the contrary, casual observation shows that Ghana has not made much effort in this direction though there have been national calls to reduce human activities, especially, the burning of fossil fuels (e.g. coal and oil) which intensify climate change (Evans, 2004). The Ghana national climate change policy also appears to be silent on curriculum effort that is needed to transform the knowledge base of learners in the country.

In Table 1, 54 (69%) of the respondents agreed to a large extent that the Social Studies curriculum should be redesigned to better handle issues of climate change. This is a clarion call, and Ghana could replicate China's example which include specific education initiatives where knowledge about climate change is included in basic, higher and adult education with a focus on awareness and participation in relevant activities (Yi & Wu, 2009). As proclaimed in the National Climate Change Policy (2013), Ghana could integrate and scale up its education efforts on climate change by drawing on its successful tactics in other sectors, such as health education. This is very essential in the sense that the recent discovery and exploration of crude oil in Ghana imposes certain demands on the environment through water pollution and gas flaring, which also pollutes the air. These, added to the pre-existing environmental problems are likely to aggravate the situation as maintained

by Boadu and Oden (2013) and consequently lead to climate change.

The onus then lies on what should be included in our curriculum (and other materials) to enrich the content of the Social Studies curriculum in the line of climate change. In Table 1, they have already indicated that the Social Studies curriculum should be redesigned. In doing this they suggested at the open-ended section of the questionnaire some ideal features that, to them, such a new curriculum poised to address climate change should possess. They first called for an all inclusive collaboration between curriculum developers, all stakeholders as well as implementers (especially, teachers) when redesigning the curriculum to respond to climate change. They also suggested an immediate supply of appropriate teaching-learning materials that would facilitate and reinforce the teaching and understanding of climate change in schools. On this same issue, the teachers requested the inclusion of certain topics including major ones like “Climate Change and Global Warming”, “Causes and Effects of Climate Change” “Measures to Solve Problems Created by Climate Change”.

The item that requires a response is why has the Social Studies curriculum failed to respond to climate change? The opinion of the teachers concerning the response to this question is very important, not forgetting

that the introduction of new concepts, ideas, knowledge, skills, values and attitudes into an existing curriculum is always bedevilled with some challenges. Social Studies curriculum response to climate change is most likely to go through similar upheavals. It is therefore imperative to look critically into some of these challenges by reflecting on the shortcomings that might impede the smooth integration of new ideas, skills and values about climate change as part of the curriculum. Thus, they were asked to indicate some of the challenges that in their view, Social Studies education faces in responding to climate change. Table 3 presents the results.

Research Question 2: *What do teachers perceive as challenges that social studies education faces in responding to climate change?*

Implementation of every curriculum comes with its own challenges. Curriculum innovation and reforms are also not insulated from problems. Therefore, this research question was crafted to solicit the views of Social Studies teachers about the challenges that the Social Studies curriculum would face in responding to climate change. The results are presented in Table 3.

Table 3: Challenges that Social Studies Education Face in Responding to Climate Change

Degree of being a challenge or not a challenge			Statement	Challenges			
Greatest No. (%)	Greater No. (%)	Great No. (%)		Uncertain No. (%)	No No. (%)	Yes No. (%)	Total (100 %)
31 (39)	15 (19)	33 (42)	Inadequate TLMs for teaching climate change.	2 (3)	4 (5)	73 (92)	79(100)
17 (22)	27 (34)	35 (44)	Unavailability of resource persons.	2 (3)	12 (15)	65 (82)	79(100)

Table 3 continued

			Abstract nature of the causes of climate change.				79(100)
17 (21)	21 (27)	41 (52)		9 (11)	27 (34)	43 (55)	
			Difficulty in communicating climate change issues to the students.				79(100)
16 (20)	30 (38)	33 (42)		7 (9)	31 (39)	41 (52)	
			Centralisation of the curriculum.				79(100)
10 (13)	12 (15)	57 (72)		24 (30)	31 (27)	34 (43)	
			Inadequate teachers' knowledge on climate change.				79(100)
16 (20)	16 (20)	47 (60)		16 (20)	22 (28)	41 (52)	
			Politicisation of the debate on climate change.				79(100)
11 (14)	16 (20)	52 (66)		13 (16)	30 (38)	36 (46)	
			Because the effects of climate change has not been sufficiently felt yet.				79(100)
19 (24)	16 (20)	44 (56)		10 (13)	15 (19)	54 (68)	
			Financial constraint.				79(100)
34 (43)	13 (16)	32 (41)		9 (11)	9 (11)	61 (78)	

Field data, 2014

From Table 3, majority of the teachers agreed that about eight (8) out of 12 of the statements constitute some major challenges that Social Studies curriculum is likely to face in responding to and incorporating issues of climate change into the curriculum. The statements among others include: inadequate teaching learning materials for teaching climate change 73 (92%), unavailability of resource persons 65 (82%), Social Studies curriculum is overloaded with other issues 58 (73%), abstract nature of the causes of climate change 43 (55%), difficulty in communicating climate change issues to the students (52%), inadequate teachers' knowledge on climate change 41 (52%), because the effects

of climate change has not been sufficiently felt yet 54 (68%) and financial constraint 61 (78%).

These factors are real and throw a challenge to stakeholders of our educational system to revamp the curriculum by first dealing with the challenges cited above. For example, it is now made clear by the teachers that because the effects of climate change have not been sufficiently felt yet by individuals that is perhaps, why we are paying lips service and not showing much commitment. Most of the challenges exposed by the teachers have their roots in the financial constraint that they emphasised. In teaching the little aspects of climate change that appear under some topics in the syllabus, teachers do not have access to teaching-learning

resources resulting in abstract teaching and learning of the concepts that require concrete materials and resource persons. Development and/or redesigning of curriculum either by innovation or reform comes with financial commitment that poses a greater challenge as suggested by the Social Studies teachers.

Discussion

The study revealed that majority of the teachers 54 (68%) believed that the Social Studies curriculum is “somehow” addressing climatic issues. The respondents rated the curriculum as “somehow” 43 (54%) helping teachers to handle climatic issues and “somehow” 41 (52%) increasing students’ knowledge on climate change. The choice of the word “somehow” implies that the curriculum is not fully equipping the youth (learners) on the issues of climate change. Majority of the respondents 54 (69%) agreed to a large extent that the Social Studies curriculum should be redesigned to better handle issues of climate change. However, as to whether the curriculum would better respond to climate change if it is designed by the teachers themselves, a larger proportion of them 29 (37%) were not sure. Majority of the respondents 44 (56%) believe that the use of foreign Social Studies curriculum or books would not address climate change in Ghana.

Teachers perceived the following factors as challenges that Social Studies education faces in responding to climate change: inadequate teaching learning materials for teaching climate change 73 (92%), unavailability of resource persons 65 (82%), Social Studies curriculum is overloaded with other issues 58 (73%), abstract nature of the causes of climate change 43 (55%), difficulty in communicating climate change issues to the students 41 (52%), inadequate teachers’ knowledge on climate change 41 (52%), because the effects of climate change has not been sufficiently felt yet 54 (68%) and financial constraint 61 (78%). The teachers did not see politicisation of the debate on climate change as a factor that impede Social Studies curriculum in responding to climate change.

Conclusion

Going through Ghana’s educational system especially, at the SHS level, one of the subjects that can integrate climate change issues into its curriculum to achieve the desired result is Social Studies. This is because Social Studies as an environmentally driven subject integrate some principles of education for sustainable development in its content. To this end, in resolving issues of climate change, the contribution of Social Studies as a discipline cannot be underestimated. The curriculum efforts in dealing with climate change issues in the Social Studies curriculum at the SHS level is a clarion call to all educators and government.

A cursory look at the current Social Studies curriculum (2010) appears to give an indication that the curriculum is

not fully equipping the youth (learners) on the issues of climate change. The deduction is that the Social Studies curriculum may require a redesign. Again, several challenges impede the current Social Studies curriculum in responding to climate change. Thus, full introduction of climate issues into the curriculum would also face similar challenges.

Recommendations

Based on the main findings of the study and the conclusions drawn, it was recommended among other things that more topics relating to climate change should be introduced into the Social Studies curriculum by the Curriculum Research and Development Division. Specific education initiatives which involve knowledge about climate change must be included in basic, higher and adult education with a focus on awareness and participation in relevant activities by the Ghana Education Service.

It is also recommended that, any attempt geared towards the introduction of climate change topics into the existing Social Studies curriculum must give ultimate attention to the challenges that might impede the smooth implementation of the curriculum.

References

- Athman, J., & Monroe, M. (2004). The effects of environmental-based education on student’s achievements motivation. *Journal of Interpretation Research*, 9 (1), 9-25.
- Bangay, C., & Blum, N. (2010) Education responses to climate change and quality: Two parts of the same agenda? *International Journal of Educational Development*, 30 (4), 335-450.
- Boadu, K., & Oden, S. N. (2012). Climate change and development in Ghana: Implications for curriculum innovation in senior high school social studies and language arts curricula. In I. O. Oloyede (Ed.), *Climate change and sustainable development in Africa* (pp. 109-124). Proceedings of the second University of Cape Coast and University of Ilorin Joint International Conference. Nigeria: Unilorin Press.
- Breiting, S., Jeppe, L., Rolls, S., & Karsten, S. (2009). *Climate change and sustainable development: The response from education*. Copenhagen, Denmark: University of Aarhus.
- Chen, S. (2006). *Researching on strategy of climate education in middle school geography instruction*. Fujian: Normal University.
- Evans, R. W. (2004). *Social studies wars: What should we teach the children?* New York: Teachers College Press.

- Furman C, Roncoli C, Crane T, Paz J. O., & Hoogenboom, G. (2009). *Managing risk and climate variation among Georgia organic farmers*. Georgia: Gainesville, FL.
- Ghana Education Service (GES). (2010). *Social studies syllabus for senior high schools*. Accra: GES.
- Ghana Education Service [GES] (1987). *The social studies syllabus for JSS*. Accra: Curriculum Research and Development Division.
- Hamilton, L.C. (2008). Who cares about polar regions? Results from a survey of U.S. public opinion. *Arctic, Antarctic, and Alpine Research* 40 (4), 671-678.
- Hassol, S. J. (2008). Improving how scientists communicate about climate change. *Eos A weekly Journal of the American Geophysical Union*, 89 (11), 36-45.
- Intergovernmental Panel on Climate Change (2007). *Climate change: The physical science basis*. Cambridge: Cambridge University Press.
- Kahan, D. M., Wittlin, M., Peters E., Slovic P., Larrimore O. L., Braman, D., & Mandel, G. N. (2011). *The tragedy of the risk-perception commons: Culture conflict, rationality conflict, and climate change*. Philadelphia: Temple University Legal Studies Research.
- Kahlor, L. A., & Rosenthal, S. (2009). If we seek, do we learn? Predicting knowledge of global warming. *Science Communication*, 3 (30), 299-304.
- Laessoe, J., Schnack, K., Breiting, S., & Rolls, S. (2009). *Climate change and sustainable development: The response from education*. Denmark: Danish School of Education, University of Aarhus.
- Meng, Q. (2009). *Case study of education on climate and sustainable development in the curriculum*. Northeast: Normal University.
- National Research Council. (2010a). *Informing an effective response to climate change*. Washington, D C: The National Academies Press.
- National Research Council. (2010b). *Adapting to the impacts of climate change*. Washington, D C: The National Academies Press.
- Nazir, J., Pedretti, E., Wallace, J., Montemurro, D., & Inwood, H. (2009). *Climate change and sustainable development: The response from education*. The Canadian Perspective Centre for Science, Mathematics and Technology Education: Canada. University of Toronto.
- Smith, D., & Vivekananda, J. (2007). *A climate of conflict: The links between climate change, peace and war*. London: International Alert.
- Stern, N. (2007). *The economics of climate change: The stern review*. Cambridge: Cambridge University Press.
- UNESCO, (2012). Education sector responses to climate change. Bangkok. UNESCO.
- UNFCCC. (2007). Climate change: Impacts, vulnerabilities and adaptation in developing countries. Bonn: UNFCCC.
- Yi, J., & Wu, P. (2009). *Climate change and sustainable development: The response from education*. Beijing: Beijing Normal University