UNIVERSITY OF CAPE COAST

SOCIAL STUDIES CURRICULUM RESPONSE TO CLIMATE CHANGE: THE VIEWS OF SOCIAL STUDIES TEACHERS AND STUDENTS IN THE KORLE KLOTTEY MUNICIPALITY, ACCRA

BY

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Thesis submitted to the Department of Business and Social Sciences Education, University of Cape Coast, in partial fulfilment of the requirements for the award of Master of Philosophy Degree in Curriculum Studies.

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this University or elsewhere.

Candidate's Signature…… Date……

Name: Alice Akpene Keh

Supervisor's Declaration

I hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Supervisor's Signature…… Date …….

Name: Prof. Charles Adabo Oppong

ABSTRACT

This study examined Social Studies curriculum response to climate change through the perspectives of social studies teachers and students. The study employed a quantitative research approach by using descriptive and inferential statistics. The study used 36 social studies teachers through the census method and also sampled 253 students using proportionate stratified sampling techniques for the study. The instrument for this study comprised two sets of structured questionnaires for both students and teachers. Descriptive statistics such as frequency counts, percentages, mean and standard deviations were used to analyse the background information of the respondents and the research questions, while independent-sample t-test statistics was used to analyse the research hypothesis. The study revealed that the Social Studies curriculum in SHS in Ghana inadequately addresses climate change directly or indirectly, as teachers negatively perceive that the Social Studies adequately respond to climate change. However, the study revealed that students highly perceived the Social Studies curriculum as responding to climate change. Also, the study found that many challenges impede the effective implementation of the Social Studies curriculum to address climate change issues. Finally, the study revealed a statistically significant difference between teachers' and students' perceptions of how the Social Studies curriculum responds to climate change. The study recommends that the Social Studies curriculum should be redesigned to meet the current demands in climate change education.

KEYWORDS

Social Studies Curriculum

Curriculum Response

Climate Change

Social Studies Teachers

Social Studies Students

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DEDICATION

I dedicated this work to my lovely children.

TABLE OF CONTENT

LIST OF TABLES

CHAPTER ONE

INTRODUCTION

As the world grapples more severely with the impacts of global warming in contemporary times, there is a growing need for climate change awareness among people from all walks of life. For many, it seems to indicate that there is some level of understanding of climate change, but adequate knowledge of climate change concepts, impacts, and adaptation strategies is questionable. Furthermore, there are widespread misconceptions about the causes of this phenomenon, with some even attributing it to metaphysics. This, therefore, presents a clarion call on scholars across diverse disciplines to help enlighten stakeholders on climate change, preferably through education. Studies have shown that social studies, as a multidisciplinary subject, better prepares individuals for the comprehension of social issues such as climate change. In light of this assertion, the assessment of both teachers and students' perspectives on how the social studies curriculum has responded to issues of climate change is worth exploring.

Background to the Study

In recent years, climate change has become a significant issue for the global community (Abbass et al., 2022; Parmesan, Morecroft, & Trisurat, 2022). Undoubtedly, climate change is having a global and unprecedented impact on everything from food production and rising sea levels to the risk of catastrophic flooding (Kumar et al., 2018). Global warming and stratospheric ozone depletion have received a lot of attention in the last three decades, both from the media and the general public, as well as from scientists and policymakers worldwide. Climate change is real, and human activities are to

blame for the vast majority of the planet's recent temperature rises (Intergovernmental Panel on Climate Change, 2021). A lack of action will make it much more difficult and expensive to deal with the effects in the future.

Scholars and experts in climatology have voiced significant apprehension regarding the trajectory of the world's climate throughout the twenty-first century. They contend that observable shifts in climate patterns over recent decades have prompted widespread international discourse concerning strategies for mitigating or adapting to this emergent global challenge (Fawzy et al., 2020; Kasperson et al., 2022; Rousell & Cutter-Mackenzie-Knowles, 2020). This concern, relatively nascent within academic literature, has drawn attention to the multifaceted causes of climate change (Shepherd, 2018), encompassing both natural phenomena and anthropogenic influences. According to Mishra and Dubey (2023), natural climate variability, as evidenced by fluctuations in solar radiation, ocean currents, and volcanic activity, has historically driven climatic shifts, punctuating Earth's environmental history with cycles of warming and cooling. These complexities underscore the urgency for interdisciplinary collaboration and proactive measures in addressing the evolving dynamics of our planet's climate system. (Lean, 2017; Mishra & Dubey, 2023).

Numerous scholarly sources have extensively documented the prevalence of environmental catastrophes in Africa, with Ghana being a significant case in point (Acheampong et al., 2023; Bedair et al., 2023; Ofei-Nkansah, 2013; Kunateh, 2013). The adverse impacts of climate change, which manifest in various forms such as altered weather patterns, irregular

rainfall, and heightened occurrences of pests and diseases among both crops and livestock, are largely responsible for these calamities, leading to diminished agricultural yields and widespread property damage from flooding and drought (Kunateh, 2013). Rampant deforestation, primarily from practices like bush burning, wood consumption for fuel, and charcoal production, exacerbates Ghana's climate issues (Acheampong et al., 2023). The underlying causes of climate change, including excessive emissions of greenhouse gases, have been well documented by the Intergovernmental Panel on Climate Change (IPCC), whose 2021 report highlights the accelerated melting of glaciers in Greenland and Antarctica as a consequence of heightened greenhouse gas levels. However, it is imperative to note that even with concerted global efforts to reduce emissions in accordance with agreements like the Kyoto Protocol, the persistence of such environmental disasters remains inevitable (Bedair et al., 2023).

According to the World Bank Group (2013), Ghana is facing an imminent shift in its climate, which poses significant challenges for its future development trajectory. The adverse effects of climate change on Ghana's natural resources, such as land, water, forests, vegetation, and human capital, have been well documented (Masahudu, 2019). Particularly concerning are the shifting rainfall patterns and the escalating frequency of extreme weather events, both of which threaten the country's food security (Masahudu, 2019). Notably, the Central Region of Ghana has already experienced tangible impacts of climate change, adversely affecting the livelihoods of communities dependent on agriculture, fishing, and other natural resource-based activities (Lawson et al., 2020). This underscores the urgent need for comprehensive

public education and awareness campaigns to foster understanding and action regarding climate change mitigation and adaptation strategies among the general populace.

Addressing climate change requires a multifaceted effort to connect scientific knowledge with public consciousness, as emphasised by the United Nations Framework Convention on Climate Change (UNFCCC, 1992). The statement emphasises the crucial importance of education in promoting well-informed decision-making and proactive measures about climate change in all areas of society (McKenzie, 2021). Education, as described by Johnson et al. (2020), involves the complex process of imparting information and skills to enable individuals to effectively tackle the difficulties posed by climate change. As a result, the worldwide concern about climate change highlights the importance of educational institutions providing students with the necessary knowledge and abilities to address and adapt to climate change (Ma & Chen, 2023).

In response to the assertion regarding the introduction of subjects like Integrated Science, Geography, and Social Studies into the senior high school curriculum in Ghana to address societal changes such as climate change, it is evident that these subjects play pivotal roles in enhancing students' understanding of environmental challenges and their implications for society. Opuni-Frimpong et al. (2022) and World Education (2022) underscore the importance of incorporating interdisciplinary subjects like integrated science and geography to equip students with the requisite knowledge and skills to comprehend and respond to climate change.

Additionally, Opuni-Frimpong et al. (2022) highlights the integrative nature of the social studies subject, emphasising its effectiveness in fostering awareness and understanding of climate change among Ghanaian students. Moreover, Barton and Avery (2016) emphasise the role of social studies education in providing students with a holistic perspective on societal and environmental dynamics, thereby contributing to their ability to engage critically with issues such as climate change and sustainable resource management. Thus, the inclusion of these subjects in the curriculum serves as a means to promote comprehensive education on climate change and its socio-environmental implications among Ghanaian students.

Evidence abound in its praise on efforts made by prior researchers to address climate change issues through the lens of social studies as a multidisciplinary subject. However, despite the extensive integration of climate change education into the social studies curriculum (Abednego et al., 2024), the persistence of the climate change problem cannot be denied. This observation, as noted by Kamenez (2019) and Russell III and Waters (2021), underscores the potential inadequacies within the existing curriculum's ability to sufficiently equip Ghanaian students with comprehensive knowledge about climate change. To ensure the efficacy of educational efforts, it is imperative to heed the perspectives of various stakeholders, including school administrators and teachers, as recommended by Keogh et al.'s (2010) study. Consequently, this study attempts to examine the perceptions of senior high school teachers and students regarding the responsiveness of Ghana's social studies curriculum to climate change issues, aiming to inform potential

modifications that can enhance its effectiveness in addressing this pressing global issue.

In this study, the focus on social studies teachers and students in Ghana's Korle Klottey Municipality provides a useful lens for comprehending larger educational processes. The site was chosen with purpose, given its central location in Ghana and its reputation as a metropolis with a diverse cultural, social, and economic background. By exploring the viewpoints of stakeholders in this heterogeneous setting, the study seeks to gain insights that may be applied to the larger context of senior high school education in Ghana. This approach is consistent with recognised approaches in educational research, where case studies are used to examine phenomena within specific contexts with the goal of developing insights that are applicable beyond the immediate setting (Stake, 1995). While the study's major focus is on the Korle Klottey Municipality, its findings are intended to inform conversations and strategies targeted at improving social studies curriculum's response to climate change issues holistically.

Statement of the Problem

Over the past 50 years, human activity has emitted significant amounts of carbon dioxide and other greenhouse gases, which have had a profound effect on the Earth's climate (WHO, 2019). Due to the changes in global climate, individuals are exposed to several health hazards, including fatalities caused by high temperatures and alterations in the spread of infectious diseases (Rocque et al., 2021). Climate and weather variables are responsible for endangering food and water security as well as triggering epidemics of waterborne and vector-borne diseases. Conflicts and migration resulting from

climate change are also a consequence of the heightened strain on finite resources. Based on current forecasts, if no action is taken, global warming is expected to cause an extra 250,000 fatalities each year from 2030 to 2050, as reported by the World Health Organisation in 2019.

Health systems globally, especially those within developing nations, face escalating challenges due to the impacts of climate change. Climate change exacerbates existing health issues and introduces new threats, such as the spread of infectious diseases, extreme weather events, and food insecurity (Masahudu, 2019). To address these challenges effectively, it is imperative for governments worldwide, particularly in developing countries like Ghana, to prioritise the enhancement of health system resilience. This entails bolstering infrastructure, developing early warning systems, and implementing adaptation measures to mitigate the health risks posed by climate change (World Health Organisation, 2019). Moreover, comprehensive education about climate change dynamics is crucial at all levels of the educational system. Thus, with the integration of climate change education into school curricula, students can acquire the knowledge and skills necessary to understand, mitigate, and adapt to the impacts of climate change, thereby fostering a more environmentally aware and resilient society (Masahudu, 2019; World Health Organisation, 2019).

Increasing evidence indicates that climate change is adversely affecting Ghana's natural resources, encompassing its land, water, forests, and other forms of vegetation (Asante & Amuakwa-Mensah, 2014; Addaney et al., 2021; Adzawla et al., 2020; Masahudu, 2019). Nevertheless, Addaney et al. (2021) argue that the adverse impacts of climate change can be reduced by the

dissemination of knowledge to the entire populace, including students. Research conducted by Baker (2016) and Kamenetz (2019) has provided evidence that implementing climate change education in high schools can effectively mitigate the adverse impacts of climate change. The promotion of Ghanaian students' understanding of climate change is mostly facilitated by the subject of social studies, as stated by Evans (2009). Despite being exposed to climate change issues in the present social studies curriculum, it seems that pupils are not well-informed about the latest developments in climate change (Masahudu, 2019).

Barton and Avery (2016) extensively argue that social studies uniquely provide a platform for students to explore the interconnectedness of environmental issues with societal structures, fostering a sense of civic responsibility and empowering future generations to advocate for sustainable practices and policies. That is to say, incorporating comprehensive coverage of climate change into the social studies curriculum is critical because of its multidisciplinary nature and broad reach among senior high school students from diverse disciplines. As a result, students gain a holistic understanding of the social, economic, political, and historical dimensions of this global challenge by integrating climate change issues into social studies (Barton & Avery, 2016). This approach equips a larger percentage of citizens with the necessary knowledge and critical thinking skills to effectively address climate change.

Furthermore, the benefits of climate change education in senior high school curricula in Western countries such as the United States, the United Kingdom, and Sweden have been extensively researched (Baker, 2016;

Kamenetz, 2019; McKenzie, 2021; Mishra & Dubey, 2023). According to the researchers, climate change education helps to mitigate its negative consequences and better prepares a society and its people to be more environmentally conscious and resilient (Masahudu, 2019). Despite this, it appears that there are no scientific investigations in this area in Ghana, suggesting that there is a research gap in this area. As a result, the purpose of this study is to examine social studies teachers' and students' perspectives on how the social studies curriculum addresses climate change, the Korle Klottey Municipality as a case.

Purpose of the Study

The study seeks to draw insight from social studies teachers and students on how the social studies curriculum addresses issues of climate change.

Research Objectives

The specific objectives sought to:

1. identify social studies teachers' perceptions of the social studies curriculum response to climate change.
2. identify students' perception of the social studies curriculum response to climate change.
3. ascertain what social studies teachers perceive as challenges facing the social studies curriculum in responding to climate change.
4. assess the differences in the perception of social studies teachers and students regarding how the social studies curriculum responds to climate change.

Research Questions

1. What is social studies teachers' perception of the social studies curriculum response to climate change?
2. What is social studies students' perception of the social studies curriculum response to climate change?
3. What do social studies teachers perceive as challenges facing the social studies curriculum in its response to climate change?

Hypothesis

H_0: There is no statistically significant difference between teachers' and students' perception of how the Social Studies Curriculum respond to climate change.

H_1: There is a statistically significant difference between teachers' and students' perception of how the Social Studies Curriculum respond to climate change.

Significance of the Study

Examining the viewpoints of social studies educators and students regarding how the curriculum addresses climate change. Understanding these perspectives allows implementers of the social studies curriculum to customise teaching materials and methodologies in order to more effectively incorporate climate change topics, ensuring their relevance and efficacy. Furthermore, the Ghana Education Service will use the findings from this research to make informed policy decisions and implement curricular modifications. This enables the educational goals to be in line with current societal concerns, such as climate change.

Furthermore, the government can use this data to prioritize climate change education in national objectives, promoting a more environmentally aware population. Furthermore, non-governmental organisations (NGOs) have the ability to utilise research findings in order to create specific interventions and educational campaigns that enhance the effects of formal climate change education. Besides, instructors and students can enhance their educational experiences and promote comprehensive climate change education by being cognizant of their own viewpoints and actively participating in the process.

Also, other entities, such as communities and businesses, derive advantages from a population that possesses the necessary knowledge and abilities to tackle climate change, thereby promoting sustainable development and resilience. Finally, the study will add to the existing literature on climate change and serve as the basis for further research.

Delimitation of the Study

This study specifically focuses on utilising a quantitative approach in order to provide the study with a descriptive perspective on the problem under investigation. It also highlighted the challenges that hinder climate change coverage in the social studies curriculum. The scope of the study was delimited to the social studies curriculum response to climate change and not any other subject.

Limitations of the Study

This study is confined to the specific context of the Korle Klottey Municipality, Accra-Ghana, and does not encompass vocational and technical training institutes inside the municipality. Also, it fails to examine the viewpoints of non-academic staff in the senior high schools. The study

specifically examined climate change from an academic perspective in this study rather than the views of curriculum experts and other stakeholders.

Organization of the Study

This study consisted of five chapters. The first chapter dealt with the introduction, which covers the background to the study, problem statement, research objectives, research questions, the study's significance, delimitation, limitations, and organization. Literature related to the study was discussed in Chapter Two. The review includes theoretical and conceptual frameworks, as well as empirical studies of the problem under study. The third chapter delineated the study's methodology, encompassing the research design, research instrument, data collection procedure, and data analysis. In Chapter Four, the results and discussion of the study were presented. The final chapter drew relevant conclusions and recommendations based on the research findings and suggested further studies.

CHAPTER TWO

LITERATURE REVIEW

This chapter attempts to establish a solid foundation for the study by reviewing the relevant literature. In light of this, the literature review is categorised into conceptual review, theoretical review, and empirical review.

The Concept of Climate Change and Related Concepts

The global patterns of vegetation structure, productivity, and plant and animal species composition are all influenced by climate. While the weather can change in hours, the atmosphere can take years. The climate is the average weather for a geographic region for an extended period (Zhao et al., 2020 2003). Climate, thus, determines the number of all-weather activities in a given area over a long period of years.

Climate change has several different meanings. For example, any long-term change in average weather patterns in a particular area of the world has been defined as climate change. Similarly, Nwankwo and Unachukwu (2012) define climate change as a sustained shift in the statistical distribution of weather elements over a duration. The IPCC (2021) describes climate change as a change measurable through changes in the mean and/or variability of its properties (e.g., statistical tests) over an extended period, typically decades or longer. These definitions stress that climate change does not occur at once but over a long period of time.

Other explanations of climate change emphasise the influence of climate on humans and other organisms. According to the United Nations Environmental Programme (UNEP), climate change refers to the occurrence of extreme weather events that have harmful effects on human health,

agricultural resources, vegetation, water resources, soil, ozone layer depletion, and the increase of carbon dioxide (CO2) in the Earth's atmosphere (Ezra, 2010). In 1990, the IPCC portrayed climate change in a similar manner. The IPCC (2021) characterises climate change as a combination of natural and anthropogenic factors that has the potential to have a profound and detrimental impact on the globe, leading to unforeseen suffering.

Concepts like global warming and global weather patterns relate to climate change. According to Collier et al. (2014), global warming occurs when greenhouse gases (GHGs) absorb terrestrial emissions from the atmosphere and re-radiate the heat back to the ground. They explain that the sun emits heat onto the earth's surface, which absorbs some of it, reflects another piece into the atmosphere, and emits the remainder as infrared rays. Clouds, water vapour, and other greenhouse gases prevent the rays from escaping, ensuring that the earth's temperature remains steady under normal conditions. However, temperatures in the lower atmosphere have risen as a result of human-caused increases in GHG concentrations (Soeder, 2022), and this situation is referred to as global warming (Soeder, 2022).

Ban Ki-Moon, the former Secretary-General of the United Nations (UN), observed that climate change was the greatest problem of our time in 2008 (UNESCO, 2012). Climate change, according to Romm (2007), is coming faster and more violently than scientists had predicted, while Medugu (2009) warned of the dire implications of climate change, stating that it has the potential to impact both natural and human processes, posing a threat to human growth and survival politically, economically, and socially.

The IPCC (2021) emphasises that a warming climate leads to various negative outcomes, such as biodiversity loss, wildlife reduction, degradation of soil conditions including moisture and nutrient levels, heightened environmental damage, frequent droughts, increased rural-urban migration, greater crop invasion by pests and diseases, depletion of household assets, shifts in livelihood systems, alterations in vegetation types, decline in forest resources, elevated health risks, and the spread of infectious diseases (Araújo & Rahbek, 2006). According to the United Nations Development Programme (UNDP, 2014), such developments would affect major economic sectors and key growth drivers, such as natural resources, agriculture, health, water, and infrastructure. Developing countries will face high risks and a dynamic development image because of their poor adaptation to climate change.

Ghana's climate has become drier and more complex over the last few decades. Evidence abounds that climate change is negatively affecting Ghana's natural resources, such as land, water, forests, vegetation, and human capital (Agodzo, Bessah, & Nyatuame, 2023). According to Asante and Amuakwa-Mensah (2014), communities in Ghana's transition and coastal savannah zones are also experiencing climatic changes, with both the major and minor rainy seasons becoming shorter and the length of the growing season decreasing, limiting farmers' ability to crop more than once a year in most areas.

The Concept of Curriculum

The term "curriculum" derives from the Latin verb 'currere', which means "to run." "Currere" became a diminutive word, denoting a "racing chariot" or "race track." According to Bigloo (2021), the phrase was

eventually extended to include curriculum vitae, which means "the course of one's life." It was also related to curriculum mentis, a figurative term for "the (educational) course of the mind." The word gained popularity in the educational sector after the eighteenth century (Schneiderhan, Guetterman, & Dobson, 2019; Soto, 2015). According to Pinar (2019), the concept of curriculum is not new, but how we see and theorise it has evolved over time, and there is still much debate over what it means. As a result, defining curricula is challenging (Bigloo, 2021). It consists of disconnected or fractured parts. According to Keynes and Marsden (2021), curriculum is an obscure and incomplete area of research, as Keynes and Marsden (2021) point out, and what it signifies is a source of much dispute and even confusion.

According to Adirika and Okolie (2017), the curriculum is defined as the comprehensive endeavour of a school or educational institution to attain specific goals. Kerr (2022) further enhanced Saylor and Alexander's characterization by defining the term as encompassing all forms of education that are governed by schools, regardless of whether they are conducted individually or in groups, within or outside of educational institutions. Beauchamp viewed curriculum as a comprehensive document that encompassed several elements and served as a blueprint for students' instruction within a specific educational institution (Coşkun Yaşar & Aslan, 2021). It pertains to the activities that need to be carried out in order to acquire beneficial information, skills, attitudes, and values (Oluwatobi, Adesina, & Jammeh, 2019). The term "curriculum" refers to the specific content that students and teachers need to learn and teach in order to achieve predetermined goals and objectives (Coşkun Yaşar & Aslan, 2021).

Conversely, Wheeler characterised the curriculum as a compilation of potential encounters established in educational institutions to instill discipline in children and adolescents, shaping their thought processes and behaviours (Palupi, 2018). As stated by Bhuttah et al. (2019), Wheeler asserts that a school's curriculum encompasses all the activities that a school can consistently choose and organise in order to "promote positive changes in students' behaviour and enhance their individual personalities." The school curriculum encompasses all the activities that a school might select and systematically organise to enhance students' conduct and develop their characters. The school's involvement in young people's educational development is part of their overall experience.

As stated by Hopkinson, Hughes, and Layer (2018), the curriculum encompasses both the structured and unstructured material and methods by which learners acquire skills, gain information and comprehension, and shape their attitudes, appreciations, and values with the support of an educational institution. According to Stein, Remillard, and Smith (2017), curriculum consists of the selected and given content as well as the scheduled and spontaneous events in which students participate. The current study views the curriculum as the document, plan, or blueprint that functions as an instructional guide.

Climate Change Education

The increasing impact of climate change worldwide has piqued global interest, and schools have been charged with instilling in students the knowledge and skills they would need to prevent climate change (Prothero, 2022). Studies indicate that curricular materials play a substantial role in

classroom instruction. Servant-Miklos and Dewar (2024) argue that, unlike standards and objectives, curricula comprise the concrete information that teachers and students process during learning experiences and are part of the routine of classroom life. Evidence suggests that curricular materials designed for students can substantially shape teachers' ideas about how to teach their content (Davis et al., 2017).

According to Stevenson, Nicholls, and Whitehouse (2017), climate change is a complex socio-scientific topic that necessitates more than content teaching, so understanding the (simplified) fundamentals of the complex climate system is just one aspect of climate education. For instance, McKeown and Hopkins (2010) divide climate change education into two categories: climate and change. The scholars demonstrate that the natural sciences are involved in 'climate,' while the social sciences and humanities are engaged in 'development' or educating for change.

People increasingly view a traditional content delivery or business-as-usual approach as inadequate (Fahey et al. 2014). Preparing students for futures that are unknown or only partially understood is one of the challenges for the curriculum (Fahey 2014). The complexity of the problem and the uncertainty of ways of responding mean it is best addressed through curricula and pedagogies that fully allow students to explore the nature of the problem, discuss and debate appropriate pathways forward, and take positive actions.

According to Kagawa and Selby (2010), climate change education necessitates a versatile social-holistic learning framework that integrates learning with action in local community contexts. Classrooms should be geared towards rethinking the environment and what we take for granted

(Kagawa & Selby 2010) and promoting 'out-of-the-box thinking (Anacona et al., 2018). Thus, climate change education necessitates inquiry-based, reflexive, imaginative, and participatory learning to help students build transferable skills for fresh, unpredictable, and poorly specified circumstances (Wals, 2011).

Nnamchi and Ozor's (2009) research raised awareness and increased understanding of climate change issues, kicked off the curriculum creation process, and enhanced teaching, learning, and research in the field of climate change. Among the recommendations made was that climate change issues should be infused into the curricula of higher schools as a matter of urgency (Chakeredza et al., 2009). The curricula need to incorporate evidence-based scientific data on African experiences to address African-specific problems. The suggested areas of emphasis included agricultural, biological, and social sciences. It was pointed out that implementing adaptive measures is essential to addressing the projected consequences while reducing the severity of the impacts through mitigation measures.

According to UNESCO (2012), incorporating the necessary knowledge and abilities to address the effects of climate change in education would present considerable difficulties. Depending on the educational level and the specific local and national circumstances under consideration, the integration of climate change problems will significantly differ. In primary education, determining the appropriate time to address the topic of climate change is an important consideration. The significance of this decision is in its ability to avoid instilling fear in children and young individuals while simultaneously equipping them with the knowledge and skills to comprehend and actively

participate in addressing environmental transformations. Tensions arise in secondary education due to the conflict between a centralised curriculum and the necessity to encourage knowledge that is specific to local contexts and suitable for local needs (UNESCO, 2012).

According to Baker (2016), overloaded curricula frequently present additional challenges. Identifying the most relevant 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 that are both relevant to local, environmental, social, and political contexts and that meet broader educational targets (e.g., literacy, numeracy, and employability).

Furthermore, the chronic lack of scientific knowledge and expertise around climate change and its impact in many developing countries is a key concern for educators and policymakers at both the secondary and tertiary levels. At present, climate change education is still a peripheral topic in both educational research and practice (Kranz et al., 2022). The literature almost exclusively addresses climate change education as a domain of science education. In practice, environmental education and education for sustainable development place climate change as a minor theme in a peripheral area of the curriculum (Hart, 2013). Despite the increasing recognition of education's role in addressing climate change challenges, mainstream development thinking has yet to incorporate education's capacity to contribute to adaptation and mitigation measures (Mochizuki & Bryan, 2015). In practical terms, integrating climate knowledge and skills into existing education systems represents immediate and longer-term challenges for responding to climate

change (Mochizuki & Bryan, 2015). The immediate task is to climate-proof education systems (adaptation), while the longer-term call is to develop education systems that equip learners with the requisite skills, knowledge, and attributes to deal with future challenges (UNESCO, 2012).

The curricula of most developing countries, especially in Africa, show a critical shortage of climate change content at all educational levels, from primary to tertiary (Franco et al., 2019). Therefore, African countries must make a significant and well-targeted investment in education and training, curriculum development, research, and effective practices for communicating research findings. When implemented around climate change, such investments would yield dividends.

Curriculum Evaluation

In its simplest form, curriculum evaluation consists of all those activities undertaken to judge the worth or utility of a curriculum (Mohan, 2023). Martin (2018) indicates the activities involved in curriculum evaluation when he defines it as the collection and use of information to make decisions about an educational programme.

Evaluation is an assessment of the achievement of objectives, also known as the Tylerian view of evaluation. It proves the success or failure of a programme (Stufflebeam & Coryn, 2014). Evaluation entails ascertaining the decision area of concern, selecting appropriate information, and collecting and analysing information to report summary data useful to decision-makers. Eisner (1983) opines that the evaluation of a formal curriculum consists of the adequacy of the instructional objectives of the subject matter and learning experiences for a change in behaviour among learners.

Cahill et al. (2020) also define curriculum evaluation as the systematic process of identifying, gathering data, and making a value judgement about such data to determine a curriculum's merit, worth, and significance. It determines whether the programme implementation needs to be improved, modified, or adapted to attract innovation to actualize the set objectives. It is a quality control exercise to ensure that resources are used optimally. According to Lee and Chue (2013), curriculum evaluation can be seen as the collection and provision of evidence based on which decisions can be made about the feasibility, effectiveness, and educational value of curricula. All the definitions looked at curriculum evaluation as a data collection process for decision-making to judge whether the existing programme will be maintained or reviewed.

Taba (1962) reasons that the main goal of education is to effect changes in behaviour, and these changes are represented in the objectives of education. Thus, curriculum evaluation should determine these changes and appraise them against the values represented in the objectives "to determine how far the educational objectives are being achieved" (Taba, 1962, p. 213). The current study shares this evaluation perspective.

Theoretical Framework

Evaluation Models

There is no universally accepted method for carrying out an evaluation exercise. Evaluation experts have suggested a variety of models. An analysis of these models would yield valuable insights for assessing the social studies curriculum, as described in the study and discussed as follows:

Objectives-Based Evaluation

The objectives-based model of curriculum evaluation is attributed to Ralph Tyler. According to Tyler (1949), evaluation is essentially the process of determining to what extent the curriculum and instruction programme realise the educational objectives. In the model, therefore, broad goals or objectives are established or identified, defined in behavioural terms, and relevant student behaviours are measured against this yardstick using either standardised or evaluator-constructed instruments. The outcome data are then compared with the behavioural objectives to determine how performance was congruent with expectations. If discrepancies are found between performance and objectives, modifications are made to correct the deficiency, and the evaluation cycle is repeated.

Not all curriculum experts espouse faith in the objective model. Twining et al. (2021), for instance, argue that an overemphasis on outcomes is unsatisfactory since information about outcomes does not necessarily tell us anything about other important aspects of a curriculum, such as the quality of its objectives or how it has been taught. Eisner (1979) also points out that the outcomes of educational programmes are not completely predictable, and hence evaluating only the intended goals can lead one to neglect equally important and sometimes even more important unintended outcomes. Therefore, Eisner (1979) recommends a conception of evaluation that confines itself to pre-planned goals or objectives. For Stenhouse (1975), the objectives model "assesses without explaining. As a result, the curriculum's creator cannot learn from it. Stenhouse's point is that while using objectives as criteria

for evaluation permits judgement of failure or success, it is incapable of assisting in diagnosing why a curriculum has failed or succeeded.

The criticisms of the objectives model have given rise to several alternative models that direct attention to the 'curriculum-in-action' (Eisner, 1979). But before turning attention to those models, it is pertinent to observe that the change in focus from objectives to processes does not obviate the problem of establishing criteria by which effective 'processes' may be judged. In the absence of empirically validated and generally accepted indicators of educational quality, evaluators who focus on the process still frequently turn to stated intentions, if not more specific objectives, as benchmarks for examining actual learning experiences.

Countenance Evaluation

Stake (1967) argues for an evaluation "oriented to the complex and dynamic nature of education, one that gives proper attention to the diverse purposes and judgements of the practitioner" (Stenhouse, 1975, p. 106). In Stake's view, the two major formal evaluation activities are description and judgment. These are the two separate but complementary' counts of a programme being evaluated. As he puts it, "To be fully understood, the educational programme must be fully described and fully judged" (Stake 1968, p. 525).

The description phase collects three types of data: antecedent, transaction, and outcome data. Antecedents are any conditions existing before teaching and learning that may relate to outcomes, for example, environmental factors, school procedures, learners' interests and entry behaviour, materials, and physical facilities. Transactions are the innumerable interactions of

learners with the teacher, learners with learners, and curriculum materials. Outcomes are the impact of instruction on teachers, learners, administrators, counsellors, and others. Outcomes here are interpreted broadly to include "immediate and long-range, cognitive and conative, personal and community-wide" (Stake 1968, p. 528). Stake further suggests collecting data on intents and observations for each of the three data types. Here, it can be seen that Stake (1968) followed Tyler's rationale of comparing the intended and actual outcomes of the programme.

To establish the nature of the relationship between and among the different types of data, Stake introduces two further concepts: contingency and congruence. Contingencies relate to antecedents, transactions, and outcomes, and the relationship may be logical or empirical. We assign a logical contingency to intended categories and an empirical contingency to observed categories. In contrast to contingency, congruence concerns the relationship between contents and observations. In particular, it involves analysing how well what happens fulfils what was intended. Stake argues that the judgment phase of the model must explain standards and procedures for making judgmental statements.

Formative and Summative Evaluation

Scriven (I967) introduced the important distinction between 'formative' and 'summative' evaluation. Formative evaluation is conducted during the development or implementation of a programme to provide feedback and guidance, usually for those operating the programme. Lewy (1977) thus calls it "in-house" evaluation. Summative evaluation, on the other hand, is conducted after the completion of a course of study and for the benefit

of an external audience or decision-maker. In both formative and summative evaluation, however, the evaluation may be done by an internal or external evaluator or a combination of both.

Various writers, such as Aikin (1974), Stake (1968), and Cronbach et al. (1980), have attempted to identify systematic differences between formative and summative evaluation. But Scriven (1967) himself adheres to the view that there are no basic logical or methodological differences between the two types of evaluation. "Only timing, the audience requesting it, and how its results are used can indicate whether a study is formative or summative" (Lewy, 1977, p. 407).

Goal-Free Evaluation (GFE)

Michael Scriven created a goal-free evaluation model in 1972. At that time, the government invested a significant amount of money in education to implement more effective management practices. Such action raised the need to evaluate the educational projects that the government funded. As one person taking part in evaluating these projects, Scriven realised that the evaluations were influenced by the project's goals, which led to the low quality of the evaluations. Therefore, he proposed a new model called 'goal-free evaluation" in programme evaluation, which is defined as "a model in which official or stated programme goals and objectives are withheld or screened from the evaluator" (Youker & Ingraham, 2014, p. 47).

The term "goal" used here differs from "objective." Goals are "broad statements of a programme's purposes or expected outcomes, usually not specific enough to be measured and often concerning long-term rather than short-term expectations" (Locke & Latham, 2002, p.706). By contrast,

objectives are statements indicating a programme or intervention's planned goals or outcomes in specific and concrete terms (Locke & Latham, 2002).

Goal-free evaluation of an instructional programme determines the programme's merit by examining its actual effects, whether intended or not, without reference to its stated goals or objectives. Scriven (1967), who proposed this model, argues that attention to stated programme goals makes evaluation circumscriptive in that it narrows the range of potential outcomes an evaluator can investigate. To escape this constrictive influence, the goal-free evaluator concentrates on what a programme does rather than what it should do.

According to Stecher (1991), goal-free evaluation is not a fully realized evaluation model with formal definitions, structural relationships specifications, a framework for data collection and reporting, operating procedures, etc. It is primarily a philosophical principle for guiding the evaluation process. What is implied here is that the discovery and documentation of programme effects in goal-free evaluation would depend on the professional expertise of the evaluator. Granted this, the question arises as to how the goal-free evaluator can determine the observed effects that are attributable to the programme under investigation and those that are not. Scriven (1967) offers some guidance via his "modus operandi method.".

Likening goal-free evaluation to the criminal investigation, he suggests that the evaluator carefully examines all potential causes for observed effects and establishes a solid linkage for prior programme activities and competing influences. Like all other "new" ideas, goal-free evaluation has not escaped criticism. One of its most trenchant indictments is that it simply replaces the

programme's goals with those of the evaluator. In other words, the evaluator's criteria for making judgements are, by inference, his goals, and these substitute the goals of the programme developers. Scriven's (1967) way of reacting to this was his later use of the terms "needs-based" and "consumer-based" evaluation (Scriven, 1967). In the view of Scriven (1967), the essential criterion in an evaluation is not the extent to which the programme meets its goals but the degree to which it meets the demonstrated needs of the users.

Though goal-free evaluation appears to be erected on pleasurable philosophical underpinnings, it has yet to be widely accepted as a practical evaluation approach. Regardless, it has provided insights into effective evaluation by emphasizing the need to:

1. Ensure the independence of the evaluation.
2. Examine any programme effects.
3. Scrutinize programme goals.
4. Consider a wide range of programme outcomes.

One of the main benefits of the goal-free evaluation model is that it allows evaluators to be attentive to a broader range of programme outcomes rather than just looking for the programme results that are stuck to the programme aims and goals. In this case, goal-free evaluators function as internal or external evaluators. For example, in a curriculum development project, one member can be an internal evaluator who assesses the worth of various project endeavours regarding their results, while another evaluator who is not a project member works as an external evaluator. The second advantage of goal-free evaluation is that it can supplement goal-based evaluation (Youker & Ingraham, 2014; Youker et al., 2016). For instance, an

evaluation may start off without a goal, but later transition to a goal-based approach by using goal-free data for preliminary investigation purposes, ensuring the evaluation's examination of goal achievement (Stufflebeam et al., 1985).

Nevertheless, even though the goal-free model has a long history, it has remained conceptually abstract and highly theoretical, with very few practitioners and others who have written about it (Youker & Ingraham, 2014). "Goal-free evaluation has been widely criticised for the lack of operations by which to conduct it" (Shadish, Cook, & Leviton, 1991). In other words, it is quite challenging for evaluators to assess educational programmes using GFE as they just know the model in theory and there is a lack of knowledge of the model in practice (Irvin, Crowell, & Bellamy, 1979). The lack of knowledge in practice leads evaluators to believe they cannot use GFE in practice (Shadish et al., 1991).

Responsive Evaluation

Robert Stake created a system for evaluating education in the 1970s (Popham, 1995). The model was then developed under Stake's responsive model (Stake, 1968). Stake's responsive model is the one that "sacrifices some precision in measurement, hopefully to increase the usefulness of findings to persons in and around the programme" (Stake, 1968, p. 419).

The evaluations are considered to be responsive "if they orient more directly to programme activities than to programme intents; respond to audience requirements for information; and if the different value perspectives present are referred to in reporting the success and failure of the programme" (Stake, 1968). The responsive evaluation emphasises the "concerns of the

primary stakeholders, gathered through conversations with these parties on an ongoing basis during the evaluation" (Spiegel, Bruning, & Giddings, 1999, p. 2).

In the responsive model, the evaluator is a full, subjective partner in the educational programme who is highly involved and interactive. The evaluator's role is to provide an avenue for continued communication and feedback during the evaluation process (Stake, 1968). Stake asserts that value is subjective and not objective. It means there may be many valid interpretations of the same events based on a person's point of view, interests, and beliefs. The evaluator must collect the views and opinions of people in and around the programme (Stake, 1968).

The responsive model has several advantages. First, responsive evaluations allow questions to emerge during the evaluation process, rather than formulating them beforehand. The responsive model evaluation helps evaluators acquire a rapid understanding of the programme and determine which issues and concerns are most important to various stakeholders. Secondly, the responsive evaluation uses content-rich information to describe the programme in a way that is readily accessible to audiences (Stake, 1968; Hurteau & Nadeau, 1985).

The model, however, has some drawbacks. The first disadvantage is that the application of the model requires a lot of time, as the evaluation process takes a long time (Popham, 1995). Secondly, applying the model to evaluate educational programmes is not easy if the evaluator is not experienced (Hurteau & Nadeau, 1985). The third disadvantage comes from the high level of interaction between the evaluator and stakeholders. With such

high interaction, the role of the evaluator is ambiguous; in this case, the evaluator "serves as a resource person rather than a researcher" (Popham, 1995, p. 310).

Illuminative Evaluation

Illuminative evaluation belongs to the anthropological research paradigm, where the approach entails an intensive study of the whole programme. It is an approach to evaluation that seeks to address and illuminate a complex array of questions about the implementation of the innovative educational project: how it operates, how it is influenced by the various school situations in which it is applied, what that directly concerned regard as its advantages and disadvantages, and how students' intellectual experiences are most affected (Parlett & Hamilton, 1972). It aims to discover and document what it is like to participate in the programme, whether as teachers or pupils, and to discern and discuss the innovation's most significant features and recurring issues (Parlett & Hamilton, 1972).

Parlett and Hamilton (1976) developed the illuminative evaluation as a response to the objectives or traditional evaluation model. Parlett and Hamilton (1972) referred to the objectives model as the agriculture botany paradigm. The most common form of 'agriculture botany evaluation is an assessment of innovation by examining whether it has reached the required standards on pre-specified criteria. Students receive pre-tests, which involve weighing or measuring seedlings, instead of crops, and subsequently undergo various experiences under different treatment conditions. It then measured their attainment (growth or yield) to determine the relative efficiency of the used methods (fertilizers). Parlett and Hamilton argued that this study is

designed to yield objective numerical data, which permits only statistical analysis. Parlett and Hamilton (1972) argued that 'agricultural botany', with its emphasis on outcome measures, failed to give evaluators and curriculum developers an understanding of the causes of the failure of a programme. The approach does not show how pupils learn or why they learn some things and not others. Parlett and Hamilton (1972), therefore, developed a new, non-traditional mode of curriculum evaluation known as illuminated evaluation.

Drawing from anthropology, illuminative evaluation focuses attention on describing classroom practice as it occurs to match descriptions against what was intended and recorded in the curriculum blueprint as a ground for adjudication. It also focuses on issues that emerge during an evaluation to progressively focus on them for further in-depth investigation and to understand what is explicit and what may be hidden in a curriculum (Basson, 2006). This approach to evaluation considers the broader contexts in which educational innovations function. It is primarily concerned with describing and interpreting the context of educational innovations. Parlett and Hamilton (1972) assert that the purpose of illuminative evaluation is to examine the functioning of the innovatory project, its impact on different school environments, and the specific issues related to its benefits and drawbacks. It aims to discover and document what it is like to participate in the scheme, whether as a teacher or pupil, and, in addition, to discern and discuss the innovations' most significant features.

Parlett and Hamilton (1972), in another perspective, depict illuminative evaluation as responsive, naturalistic, heuristic, and interpretive. One of the cardinal principles of illuminative assessment, which demands that such

studies be useful and interesting to educational practitioners and policymakers who represent the target audiences, embodies the responsive element (Parlett & Hamilton, 1972). The naturalistic feature is that relevant phenomena are examined in the study as they occur "naturally" in real-life institutional settings. The heuristic character is manifested in the flexibility of study design: the study strategy is evolving, allowing continuous updating to accord with the investigator's emerging understandings of the programmeme as a whole and accommodating changes in the programmeme that result from the flux of unfolding events during the study. Finally, in addition to the full and accurate description and reporting required of all evaluators, illuminative evaluators are enjoined to "sharpen the discussion, disentangle complexities, isolate the significant from the trivial, and raise the level of sophistication of debate" (Parlett & Hamilton 1972).

These evaluators do this by discovering and constructing meaning from underlying structures and relationships to make manifest the invisible realities. This is the interpretive dimension of an illuminative evaluation. Most of the reviewed evaluation models share common features, and some can be considered complementary to others. For instance, goal-free evaluation can be considered an extension of objective-based evaluation, as the former expands the scope of variables that deserve attention in a curriculum evaluation study. The decision-oriented model differs from the objectives-based and goal-free models in that it primarily defines the evaluation target. The curriculum or its implementation in schools determines the evaluation target in the objectives and goal-free models. However, the decision-oriented model derives the evaluation target from the interests of those responsible for curriculum

decisions. Responsive evaluation emphasises continuously adapting the evaluation goal-setting and data gathering as the evaluators become acquainted with the programme and evaluation context. Illuminative evaluation shares basic principles with responsive evaluation, but the latter employs a wholistic approach and "recommends condensing the maximum amount of valid experience and informative commentary about the system studied into a readable report that will stimulate talk and bring together key topics, unresolved questions and practical thinking" (Lewy, 1977, p. 14). Indeed, the scholar rightly observed that some models are so multifaceted that they could appear in multiple categories. Together, they present a rich mix of methods and concerns for curriculum evaluation.

Element-Based Curriculum Evaluation Model

According to the element-based evaluation model, the opinions and viewpoints of participants regarding all components of the programme are to be considered (Hakan, Sağlam, Sever, & Vural, 2011). The element-based curriculum evaluation model is preferred on account of how it may provide information on issues such as whether objectives are such that they may be realised within a particular set process of application, whether the targets are compatible with the reliability principle, whether the programme allows the opportunity for the provision of educational contexts or conditions that permit the implementation of content and the realisation of prescribed objectives, and whether the programmes have reached the prescribed objectives. In such a way, the element-based curriculum evaluation model was considered from the perspective of its ability to allow for activities that could form the basis of the educational context stage and permit the researcher the opportunity to identify

whether or not targets had been met at the evaluation stage of the programme as well as to cater for a more comprehensive holistic evaluation of the system.

According to Erden (1998), at the programme evaluation stage, answers are/should be sought to the following questions/researchers are to seek answers to the following questions:

a. To what extent are the targets set out in the curriculum realized?
b. What are the basic deficiencies and problems of the curriculum?

Decision-Oriented Evaluation

According to Borich (1999, p. 414), decision-oriented evaluation is a process that produces information for selecting alternative courses of action. He states: “An evaluation is decision-oriented if it services a decision, implies a choice among alternatives, and is used in committing resources for the next interval of time before another decision is to be made." Stufflebeam (1972) identifies four CIPP evaluation model types for different educational decisions.

They are context evaluation, which helps to identify needs, set objectives, and plan or choose strategies for achieving the objectives; input evaluation, which serves structural decisions by projecting and analysing procedural designs; process evaluation, which is a programme monitoring activity to detect procedural or design defects and is a record of the actual implementation process; and product evaluation, which identifies and assesses programme attainments and also provides decisions on the continuation, modification or termination of the programme.

A similar decision-oriented view of evaluation can be found in the work of AIkin and Duff Jr. (1969), who emphasises the notion that the

evaluator's most important function is to report summary data to the decision-maker in the form of practical and clear statements about what alternative course of action should be taken. It is difficult to get a single correct way to evaluate education. This has led to a variety of curriculum evaluation models in education. The choice of evaluation model primarily hinges on the evaluation's goals and objectives. This study was based on a decision-oriented assessment.

Borich (1999) aver that decision-oriented evaluation is a process that produces information for selecting among alternative courses of action. An evaluation is decision-oriented if it services a decision, implies a choice among alternatives, and is used in committing resources for the next interval of time before another is to be made (Borich, 1999). Stufflebeam et al. (1972), whose work represented one of the first attempts to consider evaluation from a decision perspective, identified four types of evaluation in their Context, Input, Process, and Product (CIPP) model of evaluation for different educational decisions. This evaluation model requires the evaluation of context, input, process, and product in judging a programme's value.

The context evaluation helps to identify needs, set objectives, and plan or choose strategies for achieving the objectives; input evaluation serves structural decisions by projecting and analysing procedural designs; process evaluation which is also a programme monitoring activity to detect procedural or design defects, is a record of the actual implementation process; and product evaluation identifies and assess programme attainments and also provides decisions on the continuation, modification or termination of the programme. Decision-oriented view of evaluation can be found in the work

AIkin and Duff Jr. (1969), who emphasised that the evaluator's most important function is to report summary data to the decision maker in the form of practical and clear statements about what alternative course of action should be taken.

Climate change is an ongoing global phenomenon that seriously threatens humanity. Due to its devastating impact, it has become necessary for a curriculum of schools to respond appropriately to curb this menace. The CIPP model of curriculum evaluation upon which this research was based deals with a cycle of planning, structuring, implementing, reviewing, and revising decisions, each examined through a different aspect of evaluation - context, input, process, and product evaluation. This study examined the model's product variable, which is the social studies curriculum. This evaluation is, therefore, the systematic collection of information about the social studies curriculum to address uncertainties, improve effectiveness, and make decisions about what the curriculum is doing in the context of climate change education (Patton, 1986).

Social Studies Curriculum Response to Climate Change

Research and practice in teaching about climate change are still at a very early stage. Academic literature largely views climate change education as a science education topic. Climate change is a minor topic in environmental education and education for sustainable development, a peripheral area of the curriculum in practice. Despite the growing awareness that education can play a role in addressing the challenges posed by climate change, mainstream development thinking has yet to accept this. For climate change mitigation and

adaptation, integrating climate knowledge and skills into existing educational systems presents both immediate and long-term challenges (UNESCO, 2012).

In Ghana, the introduction of Integrated Science and Geography in the Senior High School curriculum has been credited with helping students learn about social changes, including climate change. Social Studies education at the SHS level has also been acknowledged as one subject in tune with environmental issues, including climate change. In this regard, it is expected that such a curriculum poised in dealing with environmental challenges will highlight more topics on climate change. However, it appears that the curriculum effort is not enough to address climate change in the SHS Social Studies curriculum. Athman and Monroe (2004) support this view when they state that interdisciplinary efforts to combat climate change have not succeeded in the formal education sector.

The Social Studies curriculum in Ghana, which spans three years, has sections comprising: Environment, Governance, Politics, and Stability; Socio-Economic Development (GES, 2010). Some of the topics studied 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 the Conservation of the Environment. However, these topics, in an attempt to address environmental issues, are only included in the final year's class syllabus. Despite introducing students to the concepts of climate change at this level of their education, it seems that there is no continuity in the subsequent years. Besides, the third year in which these aspects of climate change are taught is an examination year, and the student's attention and time

are taken up by six or seven other subjects that must be passed if the student is to progress to the next stage of the educational ladder.

Though the social studies curriculum provides an opportunity for learners to further explore their immediate environment and the world at large, there are shortfalls in the curriculum. According to Osam, Kankam and Donkor (2016), a cursory look at the current Social Studies curriculum, which is still in use, appears to indicate 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, such as the centralization of the curriculum (Osam et al., 2016). Thus, the full introduction of climate issues into the curriculum would face similar challenges. The contribution of social studies as a discipline cannot be underestimated. The efforts to deal with climate change issues in the Social Studies curriculum at the SHS level are a clarion call to all educators and the government.

Teachers' Perception of Climate Change

It is critical to understand teachers' perceptions of climate change, as these perceptions, shared through regular interactions, will affect their students' understanding of climate change and related issues (Chowdhury et al., 2021). It is logical to expect that teachers teaching courses related to the environment, climate change, and disasters will transfer their knowledge, beliefs, and practices to their students. Any change in teachers' perceptions of climate change can bring about a predictable change in students; teachers who

perceive climate change as a serious problem can lead students to perceive the same (Stevenson, Nils Peterson, & Bondell, 2018).

Teachers' perceptions of climate change are related to past experiences of climate change impacts, knowledge about climate change and individual personality traits (Luo, 2003; Lambert & Bleicher, 2013), and the beliefs that shape thinking and actions, particularly in responding to the impacts of climate change (Rimm-Kaufman, 2006). However, experience and knowledge about climate change form the basis of these perceptions (Chowdhury et al., 2021). For instance, Chowdhury et al. (2021) found that teachers believe climate change affects sea level and food production, negatively impacts livelihoods and reduces the diversity of an ecosystem.

Teachers' perception of climate change in educational institutions is particularly important, as it can serve as an essential source of information to counter any misconceptions students may conceive about the environment. Anderson (2010) posits that teachers are an untapped resource that the world can use to combat climate change. They can use their expertise to disseminate information on climate change in the classroom and beyond the school compound to help individuals and communities make informed decisions and take sustainable actions to build a climate-resilient society (Anderson, 2010). Therefore, education institutions must adopt new curricula (Ho & Seow, 2017), active teaching strategies and practices, and assessment methods to change student behaviours in the face of climate change and its environmental impact (Morgado et al., 2017).

Students' Perception of Climate Change

Investigations of students' perceptions of climate change help reveal important insights into their thinking and understanding of environmental issues and scientific concepts. Studies on climate change show that students have a lack of perceptions of ozone layer depletion and global warming, climate, and weather (Lombardi & Sinatra, 2012), on the radiation involved in the greenhouse effect (Choi et al., 2010), and on the causes and consequences of climate change (Pruneau et al., 2001). These perceptions persist even after instruction about climate change and weather (Cordero, Todd, & Abellera, 2008). Perceptions are affected by sources of information like the media and schools.

Students imbibe experiences from parents, peers, their own direct experiences, the curricula, and the teachers, consciously or otherwise, in formulating their perceptions (Crona et al., 2013). Thus, students could be considered to reflect the 'culture' of the community, which, per Crona et al. (2013), is akin to shared community perceptions of environmental problems.

According to Pitpitunge (2013), students usually have perceptions of the basic concepts of climate change. However, they mostly lack perceptions of climate change's effects and mitigations (Pitpitunge, 2013). This implies that students have poor knowledge and comprehension of climate change. It indicates that the students need a deeper understanding of the different concepts in each aspect of climate change. They must evaluate the basic concepts of climate change: causes, effects, mitigations, and adaptations. They need more activities to explore and investigate climate change phenomena.

Cordero et al. (2008) suggested active learning methods to improve students' understanding and eliminate their lack of perceptions. Students should be involved in the teaching and learning process. Climate change education should be scientifically and socially oriented to increase students' knowledge and comprehension of the different aspects (Pitpitunge, 2013). Environmental education for students of all levels is the most efficient way to raise awareness among the public about important environmental issues and engage them in adaptive actions concerning climate change and global warming (Andersson & Wallin, 2000; Taber & Taylor, 2009).

Empirical Review

Teachers' Perception of the Social Studies Curriculum Response to Climate Change

The effects of climate change are already significantly impacting people's lives and the environment. The search for long-term solutions to this problem continues. One of the most effective ways to combat climate change is through education. As such, several studies have investigated how school curricula attempt to address climate change in the education system. Baker (2016) investigated the views of social studies teachers in the Cape Coast Metropolis on how the social studies curriculum responds to climate change. Seventy-nine (79) high school social studies teachers were surveyed. The study established that the social studies curriculum somehow addressed climate change issues. The use of the word 'somehow' implies that the curriculum is not adequately addressing climate change issues.

Another study by Higde, Oztekin and Sahin (2017) examined Turkish pre-service science teachers' awareness, beliefs, values, and behaviours

pertinent to climate change. Specifically, the teachers were asked to describe their beliefs, awareness, values, and behaviours regarding climate change. A sample of 1277 pre-service science teachers from different geographical regions of Turkey was used for the study. The study revealed that the majority of teachers were aware of climate change issues. In addition, the study found that many pre-service teachers prefer to walk or use a bike instead of driving because it consumes less energy. Again, the study established that human activities are to blame for climate change issues. The findings suggest that pre-service teachers are aware of climate change issues in the school curriculum.

Boon (2016) also examined pre-service teachers and climate change. Eighty-seven teachers participated in the study. The findings revealed that teachers were knowledgeable about climate change and sustainability issues. However, the result indicated that the main sources of teachers' knowledge about climate change are the media and other web-based materials, which comprised a quarter to a third of pre-service teachers' sources of content knowledge. Some pre-service teachers also cited tertiary education as their source of knowledge, given that their knowledge score at the high school level on climate change was generally low. This implies that the pre-service teachers perceive the high school curriculum to respond to climate change inadequately.

In another study, Adedayo, Mudasiru, and Saheed (2012) in Nigeria surveyed the perceptions of teachers and students on climate change. Specifically, the study examined the perceptions of teachers and students at secondary schools in Nigeria about climate change. A random sampling technique was used to select 1000 students and 500 teachers. The results

showed that teachers were aware of climate change, while the majority of the students indicated low awareness of climate change. There was a significant difference between teachers' and students' perceptions of climate change, as teachers were more aware of climate change than students.

In the United States, Wise (2010) investigated Colorado's secondary school teachers' knowledge of climate change. In all, 628 secondary teachers were surveyed for the study. The study revealed that teachers knew that climate change was a result of human activities. This was in congruence with the findings of Monroe, Oxarart, and Plate (2013), who conducted the same study in the US. A survey was conducted with 746 teachers. The findings revealed that teachers were aware of the causes and impact of climate change, as well as the adaptation and mitigation strategies for climate resilience. Herman, Feldman, and Vernaza-Hernandez (2017) also investigated the differences in climate change knowledge among Florida and Puerto Rico high school teachers in the in the US. The study revealed that the teachers had knowledge of climate change in the school curriculum. This implies that climate change issues are addressed in the school curriculum.

These studies suggest that teachers have some perception of climate change and the school curriculum. For instance, the teachers had the perception that climate change was a result of human activities. And this perception had been established through teachers' engagement with the school curriculum. This current study would provide another perspective from the Klortey Korley Municipality, Accra.

Student's Perception of the Social Studies Curriculum Response to Climate Change

Karpudewan and Mohd Ali Khan (2017) investigated students' knowledge and motivation towards the environment. Specifically, the study attempted to integrate experiential-based climate change education into the teaching and learning of secondary school lessons on the topic of endangered ecosystems to improve students' knowledge of climate change and increase motivation towards caring for the environment. Two classes from a school were randomly assigned to experimental (N = 30) and control groups (N = 32). The findings established a statistically significant difference in knowledge and motivation between the students exposed to climate change activities and the control group. This implies that students are more knowledgeable about the causes and ways to address climate change when introduced to climate change activities than students who are not introduced to climate change activities. The findings described that constructivist-based experiential learning would successfully develop awareness and encourage learning and critical thinking about climate change among the students.

In another study, Christensen and Knezek (2018) examined the impact of middle school students' energy monitoring activities on climate change beliefs and intentions. Data were collected from 794 treatments (experimental group) and 521 comparisons (control group) students. The findings revealed that the perception of middle school students' climate change is influenced by practical classes or activities of interest in energy and the environment. Study participants in the treatment group were more concerned about climate change than those in the control group, according to the findings of the researchers.

The findings presented provide evidence that curriculum projects with hands-on learning activities positively influence climate change beliefs and intentions and increase the strength of the association between the two constructs.

Hestness, McGinnis and Breslyn (2019) also examined the relationship between middle school students' sociocultural participation and their ideas about climate change. The study sampled 39 students in a suburban community on the U.S. East Coast. The study revealed that students' understanding of climate change was shaped by their involvement in local communities inside and outside school. This understanding of climate change as a result is also influenced by their interactions with media, such as the internet and television, and their school-based learning activities and experiences, such as conversations with teachers. The study concluded that viewing students' climate change understandings as a product of the unique sociocultural activities they are already participating in may provide a valuable foundation for planning science learning experiences that resonate personally with students.

Pitpitunge (2013) examined students' perceptions of climate change. The study randomly selected 122 science high school students from the Philippine Science High School. The results showed that the students hold more perceptions of the basic concepts and causes of climate change, but they lack perceptions of the effects, mitigations, and adaptation strategies of climate change. The study concluded that students have poor knowledge and comprehension of climate change. It indicates that the students need a deeper

understanding of the different concepts in each aspect of climate change. They need more activities to explore and investigate climate change phenomena.

Azeiteiro et al. (2018) investigated high school student perceptions and comprehension of climate change. This study aimed to investigate high school students' perceptions of climate change and global warming. This study was conducted using 270 Portuguese high school students. The study revealed that the majority of students believed climate change was happening and that human activities were the causes of climate change.

Variations in Teachers' and Students' Perceptions of the Social Studies Curriculum Response to Climate Change

Students' and teachers' perspectives on climate change and its implications for curriculum development were investigated by Adedayo et al. (2012). The study was carried out to examine the perceptions of teachers and students at secondary schools in the south-western states of Nigeria about climate change. A random sampling technique was used to select 1000 students and 500 teachers from the region. The results established that the majority (84%) of the teachers were aware of climate change, while the majority (69%) of the students indicated a low level of awareness of the climate phenomenon. There was a significant difference between teachers' and students' perceptions of climate change (t-value = 4.74, $p \leq .05$; df = 1498), as teachers were more aware (mean = 121) about climate change than the students (mean = 116). This implies that teachers and students have knowledge of climate change, though differences exist in their awareness of it.

In another study, Eze (2020) examined teachers' and students' awareness of climate change in the Nsukka Local Government Area of Enugu State, Nigeria. A sample of 312 students and 56 teachers was used for the study. The findings revealed that teachers and students have different levels of awareness of climate change. Again, the study established a statistically significant difference between teachers' and students' perceptions of climate change, as teachers were more aware of climate change than the students. The researcher indicated that various factors, including home location, academic discipline, and education level, may be the reasons for the differences.

Edo and Osuji (2016) also investigated teachers' and students' perceptions of climate change dimensions on teaching and learning in secondary schools in Port-Harcourt Local Government Area, Rivers State, Nigeria. The researchers collected data from 112 teachers and 849 students for the study. The study established no significant relationship between teachers' and students' opinions on the strategies for combating teaching and learning climate change challenges in secondary schools. This means that teachers and students have the same opinions on the strategies for combating climate change in secondary schools. The results indicated that severe weather conditions, whirlwinds, and excessive heat were among the dimensions of climate change that negatively impact teaching and learning. It was therefore concluded that awareness is being created among teachers, students, and other stakeholders to checkmate the negative impact on the teaching and learning of climate change.

Challenges Associated with Social Studies Curriculum Response to Climate Change

Every curriculum has its own set of difficulties that must be overcome during implementation. Curriculum reforms and innovations are not exempt from challenges. In a study, Baker (2016) examined social studies teachers' views on the challenges faced by the social studies curriculum in the Cape Coast Metropolis, Ghana. Seventy-nine (79) high school social studies teachers were surveyed. The study revealed inadequate teaching-learning materials for teaching climate change 73 (92 percent), the lack of available resources for persons 65 (82 percent), the overburdening of the Social Studies curriculum 58 (73 percent), the abstract nature of the causes of climate change 43 (55 percent), the difficulty in communicating climate change issues to the students 41 (52 percent), and inadequate teachers' knowledge of climate change (78 percent) as the main challenges the teachers perceived.

In another study, Kwenin (2021) investigated the social studies curriculum's role in mitigating climate change challenges in Cape Coast Metropolis, Ghana. The study sampled 154 social studies teachers in 79 junior high schools (JHSs) in the Cape Coast Metropolis. The study's objective is to ascertain social studies teachers' views on the challenges of social studies education in responding to climate change issues. The findings revealed inadequate learning resources, a lack of teacher competency in handling social studies, and a large number of students in a crowded classroom, posing a major problem in teaching climate-related issues in social studies. According to the researcher, these challenges tend to cripple the Social Studies curriculum in mitigating climate-related challenges.

Summary of Literature Review

The literature review was carried out to aid the researcher in developing a theoretical and empirical framework for the investigation. The theoretical literature review looked at curriculum evaluation and evaluation models such as countenance evaluation, formative and summative evaluation, decision-oriented evaluation, goal-free evaluation (GFE), responsive evaluation, illuminative evaluation, and the element-based curriculum evaluation model. However, this study is underpinned by decision-oriented evaluation.

Reading the literature on the social studies curriculum response to climate change, a host of scholarly materials address varied perceptions of climate change education. Several studies revealed that teachers are aware of climate change issues in the school curriculum. Studies posit that the educational curriculum is not adequately addressing climate change issues.

Teachers were established to be more aware of climate change than students. As teachers were considered to be knowledgeable about climate change issues, students have poor knowledge and comprehension of climate change per literature. This implies that differences exist in the teachers' and students' levels of awareness of climate change. However, the literature revealed that constructivist-based learning would successfully develop awareness and encourage learning and critical thinking about climate change among students. It indicates that the students need a deeper understanding of the different concepts in each aspect of climate change, which should be included in the curriculum.

Regrettably, most of these studies have been conducted outside Ghana. Although climate change is a global phenomenon, school curricula vary across countries. Few studies have been done in Ghana to evaluate the depth of the topics in the social studies curriculum on climate change. However, this is insufficient to draw policymakers' attention to the shortfalls of the social studies curriculum's response to climate change. In general, there is an ill response of the social studies curriculum to climate change in senior high schools in Ghana. This has created a paucity of research on the social studies curriculum's responses to climate change. This current research, hereafter, aims to: identify social studies teachers' perceptions of how the social studies curriculum responds to climate change; identify the students' perceptions of how the social studies curriculum responds to climate change; and ascertain what social studies teachers perceive as challenges facing the social studies curriculum in responding to climate change.

CHAPTER THREE

RESEARCH METHODS

This chapter describes the steps to gather data for the study. Specifically, it covers the research design, population, sample and sampling techniques, research instruments, data collection procedure and method of data analysis.

Research Approach

A research approach is a plan or procedure for a study that spans the steps from broad assumptions to detailed methods of data collection, analysis, and discussions (Creswell & Creswell, 2017). A research design cannot be adopted without a given research approach. Thus, the research approach plays a vital role in any scientific research. Creswell (2017) identified three key research approaches: qualitative, quantitative, and mixed methods.

The researcher employed the quantitative approach for this study to guide the research process. The quantitative approach involves the process of employing objective measures to numerical data with the view of demonstrating the relationships existing between variables (Cresswell & Cresswell, 2017). In a quantitative approach, researchers employ quantitative methods to assess the magnitude and frequency of constructs to explore their meaning and understanding (Creswell, Klassen, Plano-Clark, & Smith, 2011). The core assumption of the quantitative approach as a characteristic of descriptive research involves using numerical analysis of hypothesis formulation and testing or formulating research questions and seeking answers to them (Cresswell, 2014). This approach allowed the researcher to collect and analyse data from social studies teachers and students in quantitative terms in order to ascertain the social studies response to climate change. Cresswell

(2014) further noted that the approach is suitable for examining the strength and magnitude of relationships, likewise, the effect of a variable on another quantitatively.

Consequently, by utilising this approach, the researcher analysed the perspectives of social studies teachers and students regarding the curriculum's response to climate change through the application of statistical testing. This technique involved an objective examination of the perspectives of social studies teachers and students on climate change topics in the curriculum.

Research Design

This study employed a descriptive cross-sectional survey design. The approach facilitated the researcher in gathering quantitative data by employing a questionnaire to get responses from social studies teachers and students, with the aim of accomplishing the study objectives. Leedy and Ormrod (2013) state that descriptive design encompasses the identification of characteristics in a study that may reveal potential relationships or phenomena between the variables under investigation.

Sirisilla and Sirisilla (2023) also stated that a descriptive study design allows for the collection of information from various individuals without altering the environment. The utilisation of a descriptive cross-sectional survey design facilitated the acquisition of data from both social studies teachers and students at a certain moment in time. According to Sirisilla and Sirisilla (2023), the descriptive survey design involves the process of describing, observing, and documenting different elements of a scenario in order to determine correlations between variables.

Babbie (2010) suggests using a descriptive cross-sectional survey to make inferences about the features, attributes, or behaviour of a sample based on a population. Babbie has identified three deficiencies in the utilisation of the descriptive survey design for research. These challenges encompass the task of providing the utmost clarity in the questionnaire, ensuring accurate responses from the respondents, and ensuring timely completion of the questionnaires. Although the descriptive cross-sectional survey design has its limitations, pilot testing of the study was conducted to address the problem of unclear phrases. Thus, ambiguous words were rephrased to enhance clarity.

Population

Population refers to a group about which a study seeks to generalize or the theoretically determined grouping of study subjects. A study population, also known as a target population, is a set of elements from which a sample is drawn (Babbie, 2011). According to Creswell (2014), it can also be defined as "the population of individuals whom the researcher is interested in describing and making statistical inferences about" (Adom, 2015, p.106). The study sought to examine social studies curriculum response to climate change looking at the views of the social studies teachers and students.

The target population was social studies students and teachers in all the Senior High Schools in the Klortey Korley Municipality of the Greater Accra Region of Ghana. The accessible population of the students was 750, which comprised Presbyterian Senior High School (221), Accra High School (217), Kinbu Secondary Technical School (204), and Salem Senior High School (108) at the time of the study.

Sample Size and Sampling Technique

Simple random sampling and the census method were employed for students and teachers' selection respectively in this study. The sample size of 253 students corresponded with a population of 750 students. 36 teachers were purposefully selected from the Senior High Schools in the Klortey Korley Municipality through the census approach. The sample size selection of students was informed by the Krejcie and Morgan's (1970) sample size table. Thus, the sample size of 253 social studies students were appropriate for the study. The simple sampling technique was used to sample the 253 students. The simple random sampling technique was deemed appropriate for the study because each student had an equal chance of selection. The sample size distribution is presented in Table 1.

Table 1: Sample Size Distribution of Students

Schools	Population Size	Sample size
Presbyterian Senior High School, Osu	221	74
Accra High School	217	72
Kinbu Secondary Technical School	204	70
Salem Senior High School, Osu	108	37
Total	**750**	**253**

Source: Author, (2023)

Also, due to the size of the target population of social studies teachers, the study adopted the census method to include all 36 social studies teachers in the study, with each senior high school in the Klortey Korley Municipality contributing 9 social studies teachers each. The population census is unique because it allows examining small and special population groups and acquiring information on small units (Orodho, 2009).

Data Collection Instrument

A structured questionnaire was used to obtain data from respondents. This instrument was chosen because it made it easier for participants to provide responses to questions. Closed-ended questionnaires have been developed for the responders. The items were informed by a thorough assessment of the literature, as well as climate change topics from the social studies curriculum.

Two sets of structured questionnaires were developed for students and teachers. The questionnaire for teachers contained three components, but the one for students had two sections. In both cases, Section 'A' of the questionnaire required demographic information from respondents. Section 'B' of the teacher and student questionnaires was used to elicit responses from respondents' perceptions of the social studies curriculum's response to climate change. However, Section 'C' of the teachers' questionnaire elicit responses from teachers concerning challenges with the social studies curriculum. Sections 'B' and 'C' of the questionnaire were graded on a 4-point Likert Scale, ranging from one (1) to four (4). That is, Strongly Disagree -1, Disagree-2, Agree-3, and Strongly Agree-4 (See appendix A).

Validity and Reliability of the Instrument

To ensure the instrument's validity, the researcher's supervisor vetted the questionnaires before the data collection began. The pre-test helped to reframe and re-structure ambiguous items. Some items were re-arranged to ensure logical ordering and deletion of repeated and lengthy ones. More importantly, the pre-testing of the instrument assisted in the establishment of

internal consistency (reliability of the instrument). Additionally, expert scale inspection of the instrument was carried out to ensure content validity.

Again, a reliability test was done to check the internal consistency of the indicators used to measure the various variables. Cronbach's alpha (α), on a scale of 0 to 1, was used to test the reliability of these measurements. The rule of thumb is that any construct's question items should be greater or equal to (≥) 0.7 (Cohen, 1988). Creswell (2014) suggested that the closer the α value to 1, the better its reliability.

The reliability coefficient for teachers' perceptions of how the social studies curriculum responds to climate change was 0.807, demonstrating the reliability of the question items. The Cronbach's alpha (α) for teachers' perceptions of climate change issues in the social studies curriculum response was 0.823. Additionally, a 0.858 Cronbach's alpha coefficient was obtained for the items examining the challenges associated with the curriculum's response to climate change, demonstrating the reliability of students' perceptions of the social studies curriculum's response to climate change.

In this study, the pre-test was used to assess reliability and content validity, as well as to identify and problematic areas in the questionnaire. The questionnaire was pre-tested on 20 students and 5 teachers from two senior high schools in the Cape Coast Metropolis, specifically, Christ the King SHS and Adisadel College. These schools were chosen from outside the study region in accordance with Creswell's (2014) advice that pre-tests be undertaken outside the study area on a population with the same characteristics as the intended study area.

Data Collection Procedure

A letter of introduction was taken from the Department of Business and Social Science Education, University of Cape Coast, before the questionnaires were administered to the respondents by the researcher to the various heads of senior high schools in Klortey Korley Municipality in the Greater Accra Region of Ghana. The purpose of the letter was to seek permission to conduct the study at their respective schools. After permission was granted, the researcher interacted with teachers and students separately in all the schools. The purpose of the study was explained to the students and teachers. In all instances, teachers and students were given their own questionnaires to fill out. As soon as the questionnaires were completed, they were collected on the same day. For both teachers and students, the return rate of the questionnaires was 100%.

Data Processing and Analysis

The data collected from the field was sorted, edited, and coded to ensure accuracy and clarity. After editing and coding, the data was entered into the Statistical Package for the Social Sciences (SPSS version 25.0) software. Frequency counts and percentages were used to analyse the biodata of the respondents, while the mean and standard deviation were used to analyse the research questions. The research hypothesis was tested using an independent-sample t-test to determine the variance in respondents' (students and teachers) perceptions of the social studies curriculum's response to climate change.

Ethical Consideration

It is the researcher's responsibility to be truthful and respectful to all who participate in the research (Gravetter & Forzano, 2009). This helps to distinguish between acceptable and unacceptable conduct in research (Creswell, 2014). According to Patten and Newhart (2017, p.14), "the most important ethical issues in research are voluntary participation, the right to privacy, anonymity, and confidentiality." As a result, all efforts were made to address these ethical issues. All the respondents were allowed to participate in the data collection exercise on their own accord through voluntary participation. Respondents' right to privacy was protected by allowing them to complete the surveys on their own, and no information about them was withheld without their knowledge or consent. Finally, all respondents were assured that the information they provided would be kept strictly confidential.

Chapter Summary

This chapter presented a comprehensive overview of the methodology employed in the study, encompassing the research philosophy, research approach, research design, study area, population, sample, sampling procedures, data collection instrument, data collection procedure and data processing and analysis.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

This chapter presents the results and discussion of the findings. The first section of the chapter discusses the demographic information of the teachers and students. The second part focused on the main results that address the research questions and the hypothesis.

Socio-Demographic Information of Respondents

The section presents the demographic information of the respondents. These include gender, age, academic qualification, and the number of years of teaching.

Table 2: Gender of Teachers

Gender	Frequency	Percentage (%)
Male	17	47.2
Female	19	52.8
Total	**36**	**100.0**

Source: Fieldwork, 2023

The results in Table 2 indicate that out of 36 teachers, 47.2% identified as male and 52.8% identified as female. This suggests a slightly higher percentage of female teachers than male teachers. The total percentage is 100.0%, indicating that the data is complete and accurately represents the sample of teacher that engaged in social studies teaching.

Table 3: Academic Qualification of Teachers

Academic Qualification	Frequency	Percentage (%)
Post-graduate diploma	1	2.8
Bachelor's degree	26	72.2
Master's degree	9	25.0
Total	**36**	**100.0**

Source: Fieldwork, 2023

In Table 3, the breakdown of academic qualifications of teachers shows that out of a total of 36 respondents, 2.8% held a post-graduate diploma, 72.2% had a bachelor's degree, and 25.0% possessed a master's degree. This distribution highlights a majority of teachers with bachelor's degrees, followed by master's degree holders and a smaller percentage with post-graduate diplomas.

Table 4: Number of Years of Teaching Social Studies

No. of Years of Teaching	Frequency	Percentage (%)
1-5	8	22.2
6-10	20	55.6
11-15	4	11.1
16-20	2	5.6
More than 20	2	5.6
Total	**36**	**100.0**

Source: Fieldwork, 2023

The results in Table 4 indicate the distribution of teachers based on their years of teaching social studies. The majority of teachers (55.6%) have been teaching for 6-10 years, while 22.2% have been teaching for 1-5 years. A smaller percentage of teachers have been teaching for 11-15 years (11.1%),

16-20 years (5.6%), and over 20 years (5.6%). These findings suggest that there is a diverse range of experience levels among social studies teachers, with a significant number of them having taught for more than 5 years. This experience can positively impact the quality of social studies education, as teachers with more experience may have a better understanding of the subject matter and effective teaching strategies

Table 5: Gender of Students

Gender of students	Frequency	Percentage (%)
Male	116	45.8
Female	137	54.2
Total	**253**	**100.0**

Source: Fieldwork, 2023

The results in Table 5 indicate that among the 253 students surveyed, 45.8% were male, and 54.2% were female. These percentages represent the gender distribution of the student population in the study, with a slightly higher proportion of female students.

Table 6: Age of students

Age of students	Frequency	Percentage (%)
Below 14years	2	.8
14 to 16 years	9	3.6
17 to 19 years	150	59.3
Above 19 years	92	36.4
Total	**253**	**100.0**

Source: Fieldwork, 2023

Interpreting the results from Table 6 on the age distribution of students, it is evident that the majority of respondents fall within the age range of 17 to 19 years, constituting 59.3% of the total sample. Students above 19 years old represent 36.4% of the respondents, while those aged 14 to 16 years and below 14 years make up 3.6% and 0.8%, respectively, of the surveyed population.

Research Question One: What is social studies teachers' perception of the social studies curriculum response to climate change?

This research question was to identify social studies teachers' perception of the social studies curriculum response to climate change. For the purposes of analysis, "strongly disagree and disagree" are categorised as "disagree," while "strongly agree and agree" are categorised as "agree.". The result of the mean scores was discussed, with 0 to 1.90 indicating low (disagree) perception and 2.1 to 4 indicating high (agree) perception of teachers. The mid-point of 0.1 was used as the neutral point for decision making as to those who agreed or disagreed. Table 7 presents the results.

Table 7: Teachers' Perception on Social Studies Curriculum Response to Climate Change

Statements	N	D (%)	A (%)	Mean	Std. Deviation
GES social studies curriculum adequately covers the following concepts					
a. climate change	36	23(63.89)	13(34.11)	1.33	0.926
b. climate variability	36	20(55.56)	16(44.44)	1.50	0.845
c. Global warming	36	23(63.89)	13(36.11)	1.72	0.701
d. Greenhouse effect	36	23(63.89)	13(36.11)	1.78	0.760
e. Greenhouse gases	36	16(44.44)	20(55.56)	1.69	0.037
Mitigation measures of climate change are addressed by the social studies curriculum.	36	21(58.33)	15(41.67)	1.53	0.028
Adaptation measures are well addressed by the social studies curriculum	36	19(52.78)	17(47.22)	1.50	0.878
The impacts of climate change are addressed by the social studies curriculum	36	20(55.56)	16(44.44)	1.61	0.838
The source of my knowledge on climate change basically was from the following					
a. Tertiary education	36	23(63.89)	13(36.11)	1.83	0.941
b. SHS social studies curriculum	36	21(58.33)	15(41.67)	1.56	0.939
The social studies curriculum sufficiently addresses the issue of climate change	36	23(63.89)	13(36.11)	1.25	0.996
The social studies curriculum increases people's knowledge of climate change	36	18(50.00)	18(50.00)	1.50	0.910
The social studies curriculum should be redesigned to better handle issues of climate change	36	26(72.22)	10(27.78)	0.11	0.116

Source: Field survey, 2023.
Mean range: 0-1.9= low perception, 2.1-4 = high perception
Mean of means=1.61, and Mean of Standard Deviation=0.919

The results presented in Table 7 indicate that teachers have a low to moderate perception of the social studies curriculum's response to climate change. The mean values for the statements related to the coverage of climate change concepts, mitigation and adaptation measures, and climate change impacts are all below 2.1, indicating a low to moderate perception. The mean of the means is 1.61, and the mean of the standard deviation is 0.919, further supporting this interpretation.

For instance, the majority of the teachers, 23 (63.89%), disagreed that the social studies curriculum sufficiently addresses the issue of climate change (mean = 1.33, SD = 0.996). Again, the teachers disagreed that the GES social studies curriculum adequately covers climate change variability (mean = 1.50, SD = 0.845) and global warming (mean = 1.72, SD = 0.701). Also, the majority of the teachers, 26 (72.22%), agreed that the social studies curriculum should be redesigned to better handle climate change issues (M = 0.11, SD = 1.16). The results imply that social studies teachers perceive that Ghana's SHS Social Studies curriculum does not address climate change issues adequately.

The findings suggest that teachers perceive that the social studies curriculum do not adequately covers climate change concepts, such as climate change, global warming, and the greenhouse effect. The perceived coverage of mitigation and adaptation measures is also low, indicating that teachers do not believe that the curriculum adequately addresses these critical aspects of climate change.

Teachers' knowledge about climate change comes primarily from tertiary education and the social studies curriculum, suggesting that these are the primary sources of information about climate change for teachers.

However, the perception that the social studies curriculum adequately addresses climate change is low, indicating that teachers do not believe that the curriculum is effectively addressing this critical issue. Overall, the results indicate that a redesign of the social studies curriculum is necessary to effectively tackle climate change issues, as the current curriculum fails to do so. Given the importance of climate change as a global issue and the need to equip future generations with the knowledge and skills necessary to address this challenge, this is particularly important.

This result is in line with the findings of Baker (2016), Boon (2016), and Kwenin (2021). According to Baker (2016), a cursory look at the current 2010 Social Studies curriculum, which is still in use, indicates that the curriculum is not fully equipping the learners on climate change issues. Osam et al. (2016) established that the Social Studies curriculum was somehow addressing climate change issues, indicating uncertainty. Boon (2016) also revealed that the main sources of teachers' knowledge about climate change are the media and other web-based materials, which comprised a quarter to a third of teachers' sources of content knowledge. Boon (2016) contends that teachers perceive the high school curriculum as inadequate for responding to climate change. Also, Kwenin's (2021) revealed that the Social Studies curriculum at the senior high school level does not adequately cover climate-related issues.

Research Question Two: What is social studies students' perception of the social studies curriculum response to climate change?

This research question examined the students' perceptions of how the social studies curriculum responds to climate change. Table 9 presents the result. It is important to note that the degree to which the students are aware of climate change may vary depending on various understandings of the curriculum.

Table 8: Student's Perception of How the Social Studies Curriculum Respond to Climate Change

Statement	N	D	A	Mean	Std. Deviation
GES social studies lessons adequately helped me to understand the following concepts					
a. Climate variability	253	77(30.43)	176(69.57)	2.89	1.080
b. Global warming	253	60(23.72)	193(76.28)	3.05	0.909
c. Greenhous effect	253	83(32.81)	170(67.19)	2.88	0.927
d. Greenhouse gases	253	97(38.34)	156(61.66)	2.79	0.062
My knowledge in social studies has improved my understanding-of climate variability	253	86(33.99)	167(66.01)	3.87	0.013
Social studies lessons have helped me to adapt to adverse climatic conditions in society.	253	75(29.64)	178(70.36)	3.85	0.972
Social studies lessons made me understand that human activities contribute to climate change	253	46(18.18)	207(81.82)	3.08	0.896
Climate change topics in social studies should be encouraged at all levels of education.	253	50(19.76)	203(80.24)	3.06	0.913
Social studies topics sufficiently provide students reason of being mindful of their activities that adversely affect society.	253	57(22.53)	196(77.47)	2.99	0.908
Social studies lessons on climate change reveal that adverse climatic conditions are detrimental to human health	253	70(27.67)	183(72.33)	2.98	0.921
Climatic change topics in social studies are not very important	253	64(25.30)	189(74.70)	2.78	0.031

Source: Field survey, 2023
Mean ranges: Disagree (0.00 – 1.90); Agree (2.10 – 4.00).
Mean of Means = 3.84, and Mean of Standard Deviation = 0.967

The results presented in Table 8 showcase students' perceptions of the social studies curriculum's effectiveness in addressing climate change. The majority of students agreed that social studies lessons helped them understand climate variability, global warming, the greenhouse effect, and greenhouse gases, with means ranging from 2.88 to 3.05. Furthermore, students acknowledged that their knowledge of social studies improved their understanding of climate variability and that social studies lessons assisted them in adapting to adverse climatic conditions in society (means of 3.87 and 3.85, respectively).

These findings suggest that the social studies curriculum has a positive impact on students' understanding of climate change concepts and their ability to adapt to its effects. However, there is room for improvement, as evidenced by the relatively lower mean understanding that human activities contribute to climate change (3.08). For instance, the students agree that GES social studies lessons adequately helped them to understand climate variability (mean = 2.89, SD = 1.080), global warming (mean = 3.05, SD = 0.909), greenhouse effect (mean = 2.88, SD = 0.927), and greenhouse gases (mean = 2.79, SD = 0.062). Also, the majority of the students agreed to the following statements: that Social Studies lessons have helped them adapt to adverse climatic conditions in society (mean =3.85, SD = 0.972).

The results support the findings of Christensen and Knezek (2018), Evans (2009), Karpudewan and Mohd Ali Khan (2017), and Azeiteiro et al. (2018). These studies indicated that students' understanding of climate change was shaped by their involvement in classroom teaching and learning activities that exposed them to the environment. Christensen and Knezek (2018) argued

that public classes or activities of interest in energy and the environment influence middle school students' perceptions of climate change. Similarly, Hestness (2019) and Azeiteiro et al. (2018) studies corroborate the findings of the present study. These findings concluded that most students' understanding of climate change was shaped by their involvement in local communities inside and outside school. It is obvious that students' understanding of climate change comes from the classroom and their involvement in community activities.

For students to become informed and engaged citizens who can address the challenges posed by climate change, the social studies curriculum must incorporate climate change. This approach can help instill climate change issues in a larger percentage of citizens, empowering them to advocate for sustainable practices and policies. The students possess a high level of awareness regarding the significance of climate change in the environment. In order for students to assert the significance of the issues covered in the social studies syllabus, they must have conducted a comparative analysis with the knowledge they have acquired from other sources. Exposure to various forms of media, such as the Internet and television, and educational experiences, such as discussions with teachers and experts, may shape their perception of climate change.

Research Question Three: What do social studies teachers perceive as challenges facing the social studies curriculum in its response to climate change

Every curriculum has its own set of challenges to overcome when implemented. This research question was aimed at soliciting the views of social studies teachers about the challenges facing the social studies curriculum in its response to climate change. Table 9 presents the results.

Table 9: Challenges Facing the Social Studies Curriculum in its Response to Climate Change

Statement	N	D	A	Mean	Std. Deviation
The topics on climate change in the social studies curriculum are few compared to other topics	36	11(30.56)	25(69.44)	2.92	0.105
The curriculum does not provide enough room for practical lessons on climate change	36	11(30.56)	25(69.44)	2.83	0.090
The curriculum does not clearly address the nature, reasons, and effects of climate change	36	13(36.11)	23(63.89)	2.81	0.871
The issues or topics on climate change in the curriculum is appropriate to the level of SHS students	36	16(44.44)	20(55.56)	3.64	0.867
The curriculum does not indicate the specific impacts of climate change of Ghana	36	12(33.33)	24(66.67)	3.69	0.838
The curriculum does not indicate the specific impacts of climate change on the community live in	36	22(61.11)	14(38.89)	2.33	0.894
The topics on climate change are too packed/overloaded	36	4(11.11)	32(88.89)	3.75	0.732
There is inadequate TLMs for teaching climate change topics in the curriculum	36	13(36.11)	23(63.89)	2.78	1.081
It is difficult in communicating climate change issues in the curriculum to the understanding of the students	36	16(44.44)	20(55.56)	3.36	0.046

Source: Fieldwork, 2023

Mean ranges: Disagree (0.00 – 1.90); Agree (2.1 – 4.00). Mean of Means = 3.57, and Mean of Standard Deviation = 0.937

The results presented in Table 9 highlight various challenges facing the social studies curriculum in its response to climate change. The data collected indicate that teachers perceive shortcomings in the current curriculum regarding climate change education. Specifically, the findings reveal that there is a perceived lack of emphasis on climate change topics compared to other subjects, insufficient room for practical lessons, and a need for clearer coverage of climate change's nature, reasons, and effects. Additionally, the social studies teachers feel that the curriculum may not adequately address the specific impacts of climate change on Ghana and local communities, suggesting a gap in localised content. Moreover, concerns about the overload of climate change topics, inadequate teaching and learning materials (TLMs), and challenges in effectively communicating climate change issues to students are evident.

For instance, the teachers agreed that the topics on climate change in the social studies curriculum are few compared to other topics (mean =2.92, SD = 0.105); the curriculum does not provide enough room for practical lessons on climate change (mean = 2.83, SD = 0.090); the curriculum does not address the nature, reasons, and effects of climate change (mean = 2.81, SD = 0.871); there are inadequate TLMs for teaching climate change topics in the curriculum (mean = 2.78, SD = 1.081); and the curriculum does not indicate the specific impact of climate change on Ghana (mean = 3.69, SD = 0.838). Overall, the mean of means at 3.57 and the mean of standard deviation at 0.937 indicate a general agreement among respondents regarding these challenges, emphasizing the need for enhancements in climate change

education within the social studies curriculum to better meet the needs and understanding of senior high school students.

The results suggest that climate change issues have limited social studies curriculum space. Some implicit and explicit factors may have contributed to this situation. One explicit factor may be related to the fact that social studies curriculum experts do not recognise the relevance of climate change issues. And climate change issues do not merit an expanded space in the social studies curriculum. Another explicit factor could be that the social studies curriculum development policy did not emphasise the critical need for climate change issues, which may compel curriculum developers to give it attention in the curriculum. The implicit factor may be found in the rationale of the social studies curriculum. The rationale for the subject does not provide an explicit justification for climate change issues.

Regardless of the results' implications, literature abounds on the challenges social studies curricula face regarding climate change. For instance, Dynneson and Gross (1999) and Osam et al. (2016) posit that the Social Studies curriculum at the senior high school (SHS) level does not address climate issues comprehensively. Baker and Kankam (2016) further state that there are insufficient teaching-learning materials for climate change education. This observation also finds support in the current study.

Kwenin (2021), in his study, points to the fact that the Social Studies curriculum faces many challenges that impede its efforts towards realising one of its environmental objectives: mitigating climate change. For instance, the study revealed that teachers agreed that inadequate learning resources pose a major problem in teaching climate-related issues in social studies. According

to Kwenin (2021), instructional materials are one of the most significant developments in the teaching field. Students learn through their senses, which create impressions in their minds by arousing and stimulating attention. Therefore, we must employ a wide array of multimedia resources that appeal to all students' senses in teaching and learning to realize the aims and goals of climate change.

Research Hypothesis

H_0: There is no statistically significant difference between teachers' and students' perception of the Social Studies Curriculum response to climate change.

The research hypothesis sought to examine if there is a significant difference between teachers' and students' perceptions of how the Social Studies curriculum responds to climate change. The researcher used the independent sample t-test to answer this. The assumptions of homogeneity of variance were tested and satisfied via Levene's *F* test, F (253) =6.406, p=0.012. Table 10 presents the results.

Table 10: Group Statistics-Teachers and Students and Curriculum Response

Curriculum Response	N	Mean	Std. Deviation	Std. Error Mean
Teachers	36	5.6156	.81737	.05425
Students	253	5.6787	.74476	.06583

Source: Field Data (2023)

Table 11: T-Test Statistics of Teachers' and Students' Perceptions of the Social Studies Curriculum Response to Climate Change

	B	Mean	SD	t	Sig. (2-tailed)
Teachers' and students' perception	289	32.565	6.64	-2.04	0.048

Source: Fieldwork, (2023)

The results of the T-test statistics comparing teachers' and students' perceptions of the Social Studies Curriculum response to climate change show a statistically significant difference. The mean perception score for teachers was 32.565, with a standard deviation of 6.64, whereas the mean was lower for students. The t-value of -2.04 indicates a significant difference between the two groups, with a p-value of 0.048, falling below the standard threshold of 0.05. This suggests that there is indeed a statistically significant difference in how teachers and students perceive the Social Studies Curriculum response to climate change, highlighting a divergence in viewpoints between these two groups.

Social studies teachers with advanced knowledge and academic backgrounds have higher expectations for the curriculum to be more responsive to climate change as a global problem. Meanwhile, it seems that students lack sufficient awareness of climate change issues and, as a result, are unable to assess the curriculum from an expert perspective. The results find support from earlier studies such as Adedayo et al. (2012), Eze (2020), and Ekpoh and Ekpoh (2011). Overall, these studies revealed that secondary school teachers and students have a general difference in knowledge about climate change issues.

Specifically, Adedayo et al. (2012) carried out a study to examine the perceptions of teachers and students at secondary schools in the Southwestern States of Nigeria about climate change. The results established that most teachers were aware of climate change, while most students indicated a low level of awareness of the phenomenon. There was a significant difference between teachers' and students' perceptions of climate change, as teachers

were more aware of it than students. Similarly, Adedayo et al. (2012) contend that though teachers and students have knowledge of climate change, differences exist in their awareness of it. Also, Eze (2020) examined teachers' and students' awareness of climate change in the Nsukka Local Government Area of Enugu State, Nigeria. The findings revealed that teachers and students have different levels of awareness of climate change.

Chapter Summary

The chapter was developed to address the specific objectives of the study. The background characteristics of the respondents of the study was first described followed by the analysis of the various objectives through descriptive statistics and independent-sample t-test analysis. All the objectives of the study were analysed and findings reported and supported by empirical investigations. The next chapter provides conclusions and recommendations of the study.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents the summary, conclusions, and recommendations of the study. It also provides suggestions for further studies.

Summary

This study examined teachers' and students' perceptions about how the Social Studies Curriculum responds to climate change at the SHS level. The study employed a quantitative approach and relied on a descriptive survey design. The study utilised 36 teachers using a census and sampled 253 students using simple random sampling techniques. The instrument for this study comprised two sets of structured questionnaire items for both students and teachers. Descriptive statistics such as frequency, percentages, mean, and standard deviations were used to analyse the background information of the respondents and the research questions, while independent-sample t-test statistics was used to analyse the research hypothesis.

Key Findings

The following were the main findings of the study.

1. The study revealed that teachers perceive the Social Studies curriculum response to climate change to be low. For instance, the teachers believe that the social studies curriculum insufficiently addresses the issue of climate change and that the GES social studies curriculum inadequately covers climate change topics.
2. The study also revealed that students have a high perceive the Social Studies curriculum response to climate change. The students believed that social studies lessons adequately helped them to understand

climate change. Also, students agreed that Social Studies lessons have helped them adapt to adverse climatic conditions and made them understand that human activities contribute to climate change.

3. The study further revealed that the Social Studies curriculum faces many challenges in responding to climate change. Such include inadequate teaching and learning materials (TLMs) for teaching climate change topics in the curriculum, topics on climate change in the social studies curriculum are few, and the curriculum does not provide enough room for practical lessons on climate change, among others.
4. Finally, the study revealed a statistically significant difference between teachers' and students' perceptions of how the Social Studies curriculum responds to climate change.

Conclusion

Based on the findings of the study, the following conclusions have been made:

1. Regarding research question, the study concludes that teachers believe the social studies curriculum does not sufficiently address the issue of climate change and that the GES social studies curriculum inadequately covers climate change topics. This conclusion highlights the need for improvements in the Social Studies curriculum to better address climate change and meet teachers' expectations for a more comprehensive and effective education on this critical issue.
2. With reference to research question two, the study concludes that the Social Studies curriculum is effective in educating students about

climate change and its impacts and in promoting their awareness and understanding of the issue.

3. With reference to research question three, the study's findings indicate significant challenges within the Social Studies curriculum regarding its response to climate change. It is concluded that these shortcomings highlight the need for curriculum enhancements and resource development to better equip educators and students to address the critical issue of climate change within the Social Studies curriculum.
4. The study concludes that teachers and students may have different expectations or understandings of how climate change is addressed in the curriculum, indicating a need for further investigation and potential curriculum adjustments to align perceptions and ensure effective learning.

Recommendations

Based on the findings of this study, the following recommendation have been made

1. The Social Studies curriculum should be redesigned to meet the current demands in climate change education. However, in redesigning the curriculum, the views of Social Studies teachers should be considered.
2. One major shortfall in teaching and learning climate change is inadequate learning materials. Ghana Education Service (GES) must implement specific education initiatives that include providing adequate teaching and learning materials in SHSs regularly.
3. Social Studies curriculum developers must address the significant challenges within the Social Studies curriculum regarding its response

to climate change through curriculum enhancements and resource development to better equip educators and students.

4. Social Studies curriculum developers should investigate and potentially adjust the curriculum to align teachers' and students' expectations and understandings of how climate change is addressed, ensuring effective learning.

Suggestion for Further Study

This study did not cover all aspects of the social studies curriculum on climate change. As a result, the study recommends a follow-up study that focuses on other aspects to help devise possible strategies to fully address the nature of climate change shortfalls in the SHS curriculum. Also, to better understand the social studies curriculum response to climate change, the study recommends a mixed-method research approach to examine the issue qualitatively.

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APPENDICES

APPENDIX A

Ethical Review Clearance

UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD SECRETARIAT

TEL: 0558093143 / 0508878309
E-MAIL: irb@ucc.edu.gh
OUR REF: UCC/IRB/A/2016/1652
YOUR REF:
OMB NO: 0990-0279
IORG #: IORG0011497

7TH DECEMBER, 2022

Ms Alice Akpene Keh
Dept. of Business and Social Science Education
University of Cape Coast

Dear Ms. Keh,

ETHICAL CLEARANCE – ID (UCCIRB/CES/2022/36)

The University of Cape Coast Institutional Review Board (UCCIRB) has granted Provisional Approval for the implementation of your research on **Social Studies Curriculum Response to Climate Change; The Views of Teachers and Students in the Korley Klottey District.**This approval is valid from 7th December, 2022 to 6th December, 2023. You may apply for a renewal subject to the submission of all the required documents that will be prescribed by the UCCIRB.

Please note that any modification to the project must be submitted to the UCCIRB for review and approval before its implementation. You are required to submit periodic review of the protocol to the Board and a final full review to the UCCIRB on completion of the research. The UCCIRB may observe or cause to be observed procedures and records of the research during and after implementation.

You are also required to report all serious adverse events related to this study to the UCCIRB within seven days verbally and fourteen days in writing.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol.

Yours faithfully,

Koff F. Amuquandoh

Ag. UCCIRB Administrator

ADMINISTRATOR
INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF CAPE COAST

APPENDIX B

UNIVERSITY OF CAPE COAST

DEPARTMENT OF BUSINESS AND SOCIAL SCIENCE EDUCATION

Questionnaire for Teachers

This questionnaire is being administered as part of a study on **"Social Studies Curriculum Response to Climate Change; The Views of Teachers and Students in the Klortey Korley Municipality, Accra"** This research is intended for academic purposes and your honest and sincere response would contribute a lot to its success. Your individual name is not required and will not, at any time, be associated with your responses. Your identity would be confidential with regard to the information you provide.

SECTION A: DEMOGRAPHIC INFORMATION

1. Please indicate your gender
   a) Male [ ]
   b) Female [ ]
2. What is your highest academic qualification?
   a) Diploma [ ]
   b) Post-graduate diploma [ ]
   c) Degree [ ]
   d) Masters [ ]
   e) Phd [ ]
3. Tick (√) the bracket indicating the number of years you have taught in your school
   a) 1 – 5 years [ ]
   b) 6 – 10 years [ ]
   c) 11 – 15 years [ ]
   d) 16 – 20 years [ ]
   e) More than 20 years [ ]

SECTION B: TEACHERS' PERCEPTION OF HOW SOCIAL STUDIES CURRICULUM RESPOND TO CLIMATE CHANGE

Please indicate your level of agreement and/or disagreement on the following statements

NOTE: SD = Strongly Disagree, D = Disagree, A = Agree and SA = Strongly Agree

Item	Statement	SD	D	A	SA
1	GES social studies curriculum adequately covers the following concepts				
	a) Climate change				
	b) Climate variability				
	c) Global warming				
	d) Greenhouse effect				
	e) Greenhouse gases				
2	Mitigation measures of climate change are addressed by the social studies curriculum.				
3	Adaptation measures are well addressed by the social studies curriculum.				
4	The impacts of climate change are addressed by the social studies curriculum.				
5	The source of my knowledge on climate change basically was from the following.				
	a) Tertiary Education				
	b) SHS Social Studies Curriculum				
6	The social studies curriculum sufficiently addresses the issue of climate change.				
7	The Social Studies curriculum increases peoples' knowledge on climate change.				
8	The Social Studies curriculum should be redesigned to better handle issues of climate change				

SECTION C: TEACHERS PERCEPTION OF THE CHALLENGES FACING SOCIAL STUDIES CURRICULUM RESPONSE TO CLIMATE CHANGE

Please indicate your level of agreement and/or disagreement on the following statements

NOTE: SD = Strongly Disagree, D = Disagree, A = Agree and SA = Strongly Agree

Item	**Statement**	SD	D	A	SA
1	The topics on climate change in the social studies curriculum are few compared to other items				
2	The curriculum does not provide enough room for practical lessons on climate change				
3	The curriculum does not clearly address the nature, reasons and effects of climate change				
4	The issues or topics on climate change in the curriculum is appropriate to the level of senior high school students				
5	The Curriculum does not indicate the specific impact of climate change on Ghana				
6	The curriculum does not indicate the specific impact of climate change on the community students live in				
7	The topics on climate change are too packed/ overloaded				
8	There is inadequate TLMs for teaching climate change topics in the Curriculum				
9	It is difficult in communicating climate change issues in the curriculum to the understanding of the students*				

APPENDIX C

UNIVERSITY OF CAPE COAST

DEPARTMENT OF BUSINESS AND SOCIAL SCIENCE EDUCATION

Questionnaire for Students

This questionnaire is being administered as part of a study on **"Social Studies Curriculum Response to Climate Change; The Views of Teachers and Students in the Klortey Korley Municipality, Accra"** This research is intended for academic purposes and your honest and sincere response would contribute a lot to its success. Your individual name is not required and will not, at any time, be associated with your responses. Your identity would be confidential with regard to the information you provide.

SECTION A: DEMOGRAPHIC INFORMATION

1. Please indicate your gender.
   a) Male [ ]
   b) Female [ ]
2. Please indicate the age bracket applicable to you.
   a) Below 14 years [ ]
   b) 17-19 years [ ]
   c) 14-16 years [ ]
   d) Above 19 years [ ]

SECTION B: STUDENTS' PERCEPTION OF SOCIAL STUDIES CURRICULUM RESPONSE TO CLIMATE CHANGE

Please indicate your level of agreement and/or disagreement on the following statements

NOTE: SD = Strongly Disagree, D = Disagree, A = Agree and SA = Strongly Agree

Item	**Statement**	SD	D	A	SA
1	GES social studies lessons adequately helped me to understand the following concepts:				
	a) Climate variability				
	b) Global warming				
	c) Greenhouse effect				
	d) Greenhouse gases				
2	My knowledge in social studies has improved my understanding of climate variability.				
3	Social studies lessons have help me to adopt to adverse climatic conditions in the society.				
4	Social studies lessons made me understand that human activities contribute to climate change.				
5	The climate change topics in social studies should be encourage at all level of education.				
6	Social studies topics sufficiently provide students reason of being mindful of their activities that adversely affect the society.				
7	Social Studies lessons on climate change reveal that averse climatic conditions are detrimental to human health.				
8	Climate change topics in social studies are not very important				