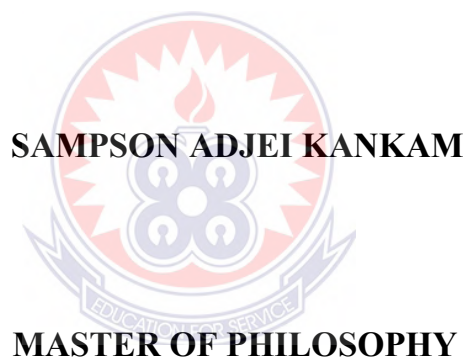


UNIVERSITY OF EDUCATION, WINNEBA

**ENSURING ENVIRONMENTAL SANITATION QUALITY
STANDARDS AND ITS IMPLICATION ON STUDENTS' HEALTH**



2020

UNIVERSITY OF EDUCATION, WINNEBA

**ENSURING ENVIRONMENTAL SANITATION QUALITY STANDARD AND
ITS IMPLICATION ON STUDENTS' HEALTH**



**A thesis in the Department of Science Education,
Faculty of Science Education, submitted to the School of
Graduate Studies in partial fulfilment
of the requirements for the award of the degree of
Master of Philosophy
(Science Education)
in the University of Education, Winneba**

DECEMBER, 2020

DECLARATION

Student's Declaration

I, Sampson Adjei Kankam declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and that it has not been submitted, either in part or whole, for another degree elsewhere.

Signature:

Date:

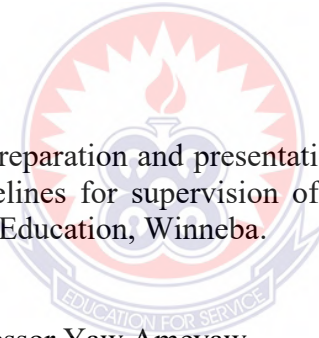
Supervisor's Declaration

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of thesis/dissertation/project as laid down by the University of Education, Winneba.

Name of Supervisor Professor Yaw Ameyaw

Signature:

Date:



DEDICATION

I dedicated this thesis to my loving wife, Elizabeth Adjei Kankam, my lovely kids; Philippa Adjei Serwaa Bonsu, Precious Boakyewaa Kankam and Christabel Serwaa Kankam as well as my dear parents, Mad. Felicia Serwaa Bonsu and Mr. T. M. Kankam Andoh of blessed memory.



ACKNOWLEDGEMENTS

My enormous thanks go to Almighty God who gave me wisdom and strength to go about my studies and whose grace sustained me throughout my studies. It would not have been possible to complete this thesis in a relatively short period of time without the support and help of a number of people whom I would like to acknowledge.

Firstly, I would like to express my heartfelt appreciation and profound gratitude to my Supervisor, Professor Yaw Ameyaw of the Department of Biology Education for his constructive criticisms, invaluable advice, expert guidance and enthusiastic commitment through the entire process of my thesis. Without his help, this thesis could not have been completed. I say thank you very much.

I acknowledge the financial assistance and moral support from my wife, Elizabeth Adjei Kankam and family members of Saint John's Baptist Church, Accra. My special thanks go to Mr. Kofi Owusu Achaw, Head of Science Department, Offinso College of Education and Mr. Jonathan Mensah, an assessment officer, Offinso College of Education who helped me in gathering my data, as well as, Mr. Peter Obeng of Department of Music, Offinso College of Education, Kumasi, who made wonderful contributions throughout the entire studies. I wish to express my appreciation to them all.

TABLE OF CONTENTS

Content	Page
DECLARATION	iii
DEDICATION	iv
ACKNOWLEDGEMENTS	v
TABLE OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATION	xi
ABSTRACT	xii
CHAPTER ONE: INTRODUCTION	1
1.0 Overview	1
1.1 Background to the Study	1
1.2 Statement of the Problem	6
1.3 Purpose of the Study	8
1.4 Objective of the Study	8
1.5 Research Questions	8
1.6 Significance of the Study	9
1.7 Delimitation	10
1.8 Limitations	10
1.9 Organization of the Study	10
CHAPTER TWO: LITERATURE REVIEW	12
2.0 Overview	12
2.1 Concept of Environmental Sanitation	12
2.2 School Sanitation	14

2.3	The Effects of Poor Sanitation on the Environment	19
2.4	Sanitation Promotion Strategies	19
2.5	Ghana's Environmental Sanitation Situation	21
2.6	Concept of Health and Hygiene	28
2.7	Urban Sanitation	32
2.8	Challenges towards Improving Sanitation Conditions	34
2.9	Waste and Disposal Methods	38
2.10	How attitude can affect Behaviour of People	46
2.11	General knowledge, Attitude and Practices of people towards Sanitation	50
2.12	Challenges towards improving Sanitation Conditions	52
2.13	Environmental Degradation and Pollution	57
2.14	Sanitation and Development of Decision making Models, & (Theoretical Framework)	63
2.15	Attitudinal Dimensions and Theoretical Framework	72
2.16	Conclusion	77
CHAPTER THREE: METHODOLOGY		78
3.0	Overview	78
3.2	The Research Paradigm	78
3.1	The Profile of the Study Area	80
3.2	Research Design	82
3.3	Population	83
3.4	Sample and Sampling Procedure	83
3.5	Instrumentation	84
3.6	Validity of the Research Instruments	85
3.7	The Reliability of the instrument	85
3.8	Data Collection Procedure	86

3.9	Data Analysis	86
3.10	Scoring of Instruments	87
3.11	Ethical Considerations	88
CHAPTER FOUR: RESULTS AND DISCUSSION		88
4.0	Overview	88
4.1	Results	89
4.2	Discussion of Findings	93
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS		95
5.0	Overview	95
5.1	Summary of Main Findings	95
5.2	Conclusions	96
5.3	Recommendations	98
5.4	Suggestion for Further Research	99
REFERENCES		100
APPENDICES		120
APPENDIX A: Letter of Introduction		120
APPENDIX B: Questionnaire for Students		121



LIST OF TABLES

Table		Page
1:	Mean ratings of the responses of respondents on the causes of poor sanitation practices in Offinso College of Education	89
2:	Mean ratings of the Respondents on the effects of poor sanitation practices on students' health in Offinso College of Education.	90
3:	Mean ratings of the respondents on the ways the school management has contributed in providing facilities that will enhance sanitation practices in Offinso College of Education.	91
4:	Mean Responses of the Respondents on Strategies that could be employed to Improve Sanitation in Offinso College of Education.	92



LIST OF FIGURES

Figure		Page
1:	The Hygiene Improvement Framework	70
2:	The Sanitation Promotion Framework	71

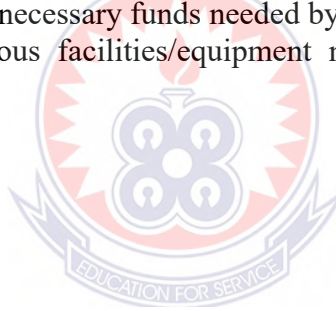


LIST OF ABBREVIATION

AMA	Accra Metropolitan Accra
BCC	Behavioural Change Communication
BOF	Biodegradable Organic Fraction
CHC	Community Health Club
CLTS	Community-Led Total Sanitation
DANIDA	Danish International Development Agency
EHP	Environmental Health Project
GNA	Ghana News Agency
HCPs	Health City Projects
HIF	Health Improvement Framework
IBM-WASH	Integrated behavioural Model for Water, Sanitation and Hygiene
ICDDR	Intervention Centre for Diarrhoea Disease Research
LMICs	Low and Middle Income Countries
MDGs	Millennium Development Goals
MINT	Material in Transition
MMDAs	Metropolitan, Municipal and District Assemblies
NGO	Non-Governmental Organization
PHAST	Participatory, Hygiene and Sanitation Transformation Tool
SANALL	Sanitation for all
SYND	Strategic Youth Network for Development
UNEP	United Nation Environmental Project
UNESCAP	United Nation Economic and Social Commission for Asia and Pacific
UNICEF	United Nation Children and Education Fund
WASH	Water, Sanitation and Health
WHO	World Health Organization

ABSTRACT

The main objective of this study was to ensure environmental sanitation quality standards and its implication on the students' health. The study adopted qualitative methodology which employed a Case study design. It was done at Offinso College of Education in Ashanti region of Ghana. The research paradigm used for the study was the interpretivism approach. It has two assumptions: relativist ontology and transactional or subjectivist epistemology. Four research questions guided the study. Instruments used for gathering the data for the study were questionnaire and interview guide. The population for the study was 635 students in the five departments of the college, they were Science, Mathematics, Social sciences, Languages and Home economics. Non- stratified random sampling technique was used to select 150 students comprising 30 students each from the five departments in the college. The instrument adopted for the study consisted of 30-item questionnaire to elicit information from the respondents. The questionnaire was validated by three experts. Cronbach alpha was used to determine the reliability of the instrument which yielded 0.76 coefficient. The data collected was analysed. The study found among others that the causes of poor sanitation were inadequate hygiene education, neglect of health facilities, insufficient water supply, inadequate fund to provide sanitation equipment and poor waste storage method. To ensure efficiency in the promoting quality environmental sanitation standards, the study recommends that the government at all levels should provide the necessary funds needed by the school management to ensure the procurement of various facilities/equipment needed for students to live in a hygienic environment.



CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter focuses on the background to the study. It looks at ensuring environmental sanitation quality standards at Offinso College of Education in Ashanti region and its implication on students' health. It gives the statement of the problem and then focuses on the need or purpose for the study. It presents significance of the study. In addition, the research questions and limitation for the study are taken care of.

1.1 Background to the Study

One of the crucial, unsolved, or even unresolved problems for those concerned with the quality of life in the world, especially the developing world is that of adequate, accessible and acceptable basic sanitation (World Health Organization (WHO), 2004c). In the recent report by the United Nations Independent Expert, Albuquerque (2009) suggests that the human right to sanitation in and of itself is inextricably linked to other human rights. Moreover, the right to sanitation involves explicit requirements in terms of accessibility, affordability, availability, quality and acceptability (Albuquerque, 2009). Based on this Mulama (2008:7) contended that Mahatma Gandhi is quoted to have said that 'sanitation is more important than political independence'.

It is a commonly held view, that developing countries would follow the development path forged by industrialized countries, aided by these 'more developed' countries (McGranahan, Pedro, Songsore, Surjadi, and Marianne, 2001: 3). According to McGranahan *et al.*, (2001) these urban sanitary practices of industrialized countries,

have helped contribute to the dignity, health and wealth of people in those countries, and thus have great bearing on the practices and the aspirations of developing countries. In the early days, waste disposal did not pose difficulty as habitations were sparse and land was plentiful. Sanitation became problematic with the rise of towns and cities where large numbers of people started to congregate in relatively small areas in pursuit of livelihoods (Shafiul & Mansoor, 2003). While the population densities in urbanised areas and per capita waste generation increased, the available land for waste disposal decreased proportionately (Shafiul & Mansoor, 2003).

Sanitation thus emerged as an essential, specialised sector for keeping cities healthy and liveable (Fobil, 2000). Hunter (2000) predicts that in the foreseeable future more than half of the world's population will live in urban areas, and that the developing countries, including Ghana will be the worst hit by sanitation problems. In a joint Monitoring Programme for water and sanitation, conducted by United Nation International Children Education Fund (UNICEF) and (WHO) (2006), Ghana is said to have an encouraging water supply of 75% and worse sanitation coverage of just 18% with less hope of improvement. It is estimated that about 2.6 billion people still do not have a safe means of disposing of their wastes exposing them to several diseases (WHO and UNICEF, 2004). In fact, so practical and pervasive are the issues of sanitation that the United Nations declared the year 2008 as the International Year of Sanitation. This is meant to address what has been called the “global sanitation crisis” (Black and Fawcett, 2008:14) Many municipalities, cities and towns continue to grapple with the problem of Solid Waste Management, especially plastic waste and the Municipality of Accra, Ghana is no exception (Amankwah, 2005).

In Offinso College of Education, a lot of places are littered with pure water polythene, pieces of papers and so on. In the School Hostel, there are problems of overcrowding and these affects the health of the students in the hostel. Many students share few toilets and also improper disposal of waste which leads to the spread of diseases.

This has made the issue of improved sanitation in the college a priority.

Since the year 2000, the world now has a global agenda from which countries can draw knowledge and experience. Known as the Millennium Development Goals (MDGs), eight goals have been set with specific targets to help accelerate the development of many countries all over the world, especially Low and Middle Income Countries (LMICs). Of the eight goals, Goal 7 is aimed at ensuring environmental sustainability. One of the targets is that, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation (WHO, 2006). The WHO Sanitation Promotion Handbook (1998, p.2) explains sanitation as “interventions to reduce people’s exposure to diseases by providing a clean environment in which to live; measures to break the cycle of disease. This usually includes disposing of or hygienic management of human and animal excreta, refuse, and wastewater, the control of disease vectors and the provision of washing facilities for personal and domestic hygiene. Sanitation involves both behaviour and facilities which work together to form a hygienic environment”.

Countries are therefore encouraged to integrate these targets into their development policies and programmes. According to the Millennium Development Goal Report (2013), gains in sanitation have been impressive but not good enough because poor sanitation can affect health, economic and social development. It further estimated that 70% of people in the urban areas lack access to sanitation even though urban

sanitation is a priority. Water, sanitation and hygiene (WASH) are among the powerful drivers of human development as it affects quality of life at many levels, including improved health and economic status (UNICEF/WHO, 2006). “There is growing awareness among public health practitioners that, until proper hygiene is consistently practiced, both at home and in the community as a whole, the desired impact of improved water and sanitation infrastructure in terms of community health benefits cannot be realized” (WASH BCC, 2011). It is estimated that about 2.5 million children lose their lives through diarrhoea diseases that could have been simply prevented by good sanitation (UNICEF/WHO, 2009). However, effective hygiene and sanitation promotion is a major challenge for many low-income countries (Rheinlander, Samuelson, Dalsgaard & Konradsen, 2010). The World Bank Group (2008) estimates annual economic losses to the tune of \$260 billion in developing countries due to poor sanitation and water supply. When sanitation improves, people’s livelihood and health or well-being will become better thereby enhancing economic productivity of the masses (Kumie & Ali, 2005).

It is therefore important that sanitation is treated as a major sector which encourages research, innovation and development as well as professionalism (Patanayak, Poulos, Yang & Patil, 2009). There is also the need for the development of strategies that can improve the sanitation delivery systems which in themselves must be collaborative in nature because sanitation promotion is a collective responsibility (Allison, 2002). This is particularly important for Ghana because a lot of attention has been placed on hygiene promotion. However, ever since sanitation became known to improve health, many of the developed countries have developed and continue to develop effective sanitation strategies - basic, onsite, food, environmental and ecological - for the various populations (Harvey, 2008). The same cannot be said of many developing and

underdeveloped countries (Hossain, & Howard, 2014; Green, de Week, & Suarez, 2013; Mallick, 2010).

Adopting a new resolution, the UN General Assembly urged UN Member States and relevant stakeholders to encourage behavioural change and the implementation of policies to increase access to sanitation among the poor, along with a call to end the practice of open-air defecation, which it deemed "extremely harmful" to public health (WHO, 2013). All 189 nations are, at all levels, to ensure the achievability of this goal by formulating and implementing policies on sanitation to eradicate the bad practices that have high rippling effects on even the achievement of the other goals. This has become especially urgent for developing countries like Ghana, where 'development' appears to precede planning (UNICEF/WHO, 2006).

In the early days, waste disposal did not pose difficulty as habitations were sparse and land was plentiful. Sanitation became problematic with the rise of towns and cities where large numbers of people started to congregate in relatively small areas in pursuit of livelihoods (Shafiul & Mansoor, 2003). While the population densities in urbanized areas and per capita waste generation increased, the available land for waste disposal decreased proportionately (Shafiul & Mansoor, 2003). Sanitation thus emerged as an essential, specialized sector for keeping cities healthy and liveable (Fobil, 2001). Hunter (2000) predicts that in the foreseeable future more than half of the world's population will live in urban areas, and that the developing countries, including Ghana will be the worst hit by sanitation problems. In a joint Monitoring Programme for water and sanitation, conducted by United Nation International Children Education Fund (UNICEF) and (WHO) (2006), Ghana is said to have an encouraging water supply of 75% and worse sanitation coverage of just 18% with less

hope of improvement. It is estimated that about 2.6 billion people still do not have a safe means of disposing of their wastes exposing them to several diseases (WHO and UNICEF, 2004).

The WHO environmental Sanitation Promotion Handbook (1998, p. 2) explains environmental sanitation as “interventions to reduce people’s exposure to diseases by providing a clean environment in which to live; measures to break the cycle of disease. This usually includes hygienic management of human and animal excreta, refuse, and wastewater, the control of disease vectors and the provision of washing facilities for personal and domestic hygiene. Sanitation involves both behaviours and facilities which work together to form a hygienic environment”. Countries are therefore encouraged to integrate these targets into their development policies and programs. The Offinso College of Education in Ashanti Region of Ghana is a well-known place to the researcher. An observation of the College as an Environmental, Health and sanitation officer gives an impression that sanitation is a great challenge and probably a major impediment to good health in the community.

1.2 Statement of the Problem

Inadequate sanitation is a major cause of diseases world-wide and improving sanitation is known to have a significant beneficial impact on health both in households and across communities. Areas which should be of much concern in respect sanitation issues are institutions like schools and hospitals. Extant research has examined several issues related to sanitation in different countries including participation of communities (Samson, 2011; Hadi, 2000).

Waste disposal, refuse disposal as well as inadequate water supply are problems in our environment especially in institutions. It is caused by a lot of factors. These include neglect of the operation and maintenance of health facilities, lack of hygiene education for the students, non-existent or insufficient water supply, poor sanitation and inadequate hand washing facilities, dirty and unsafe water supply; toilets or latrines that are not adapted to the needs of students as well as unhealthy and dirty classrooms/school compounds. These factors have led to consequences on students' health. Diseases related to poor sanitation and water availability causes many sicknesses like cholera, diarrhoea malaria and typhoid. All these diseases greatly affect students' health and therefore cannot learn properly because they are sick. Even learning in unhealthy environments affect student' learning ability.

Snel (2004) and Water Aid Uganda (2013) noted that diarrhoea which is caused by poor sanitation kills 1.5 million children each year. Based on the negative effects of poor sanitation on the health of students, something has to be done. However, it is not clear to the extent which school management have contributed in curbing poor sanitation practices in our institutions. A lot of literature available talks about environmental sanitation strategies but most of them have been done in the wider communities and not in institutions of learning (Sanni, 2015). Sanitation problem in Offinso College of Education are improper waste and refuse disposal, inadequate safe and clean water supply, littering places with sachet water polythene, overcrowding at students hostels, students sharing a few toilets, basic sanitation facilities, improper management of liquid and solid waste and poor students attitude to good sanitation practices. It is by this assertion that the study seeks to ensure environmental sanitation quality standard and its implications on students' health, at the Offinso College of

Education in the Ashanti region of Ghana in order to provide students' with good health.

1.3 Purpose of the Study

The purpose of this study is to investigate environmental sanitation quality standard and its implications on students' health in Offinso College of Education in Ashanti Region of Ghana.

1.4 Objective of the Study

The study is guided by the following objectives, that is to:

1. identify the causes of poor sanitation practices in the Offinso College of Education.
2. identify the effects of poor sanitation practices on students' health in the Offinso College of Education.
3. ascertain the ways in which the College management have contributed in providing improved sanitation facilities to ensure good sanitation practices in the Offinso College of Education.
4. find out the strategies needed to improve on good sanitation practices among students in the College.

1.5 Research Questions

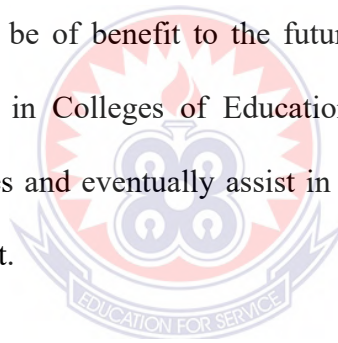
The study seeks to address the following research questions:

1. What are the causes of the poor sanitation practices in Offinso College of Education in Ashanti region of Ghana?
2. What are the effects of the poor environmental sanitation practices on students' health in the Offinso College of Education?

3. What ways have the school management contributed in providing facilities that will enhance sanitation in Offinso College of Education?
4. What are the strategies that could be employed to improve sanitation in Offinso College of Education?

1.6 Significance of the Study

Even though several studies have been carried out, relative to this topic in some parts of Ghana and to the best knowledge of the researcher, no such study had been conducted in Colleges of Education. The finding of the researcher would assist the Government in identifying the areas of weakness in the health education curriculum as it pertains to environmental sanitation quality standards in Colleges of Education. The research would also be of benefit to the future researchers and the readers on environmental sanitation in Colleges of Education and would reveal the sanitary conditions of the Colleges and eventually assist in making the Government discover the areas for improvement.



Poor sanitation poses a lot of health risks and can negatively affect economic and social development (Patanayak, Poulos, Yang, & Patil, 2009). Currently in Ghana, it is one of the most pressing issues when it comes to urbanization and public places where large populations gather (Fried, n.d). This study has major implications for sanitation Policy formulation for the development of effective sanitation strategies for institution in the overgrowing cities. It will also present or make visible the possible steps or measures that can help improve sanitation in the commercial areas on campuses where students converge for business activities. It will also contribute to knowledge in the field of environmental sanitation quality standards and academia as it will present new dimensions to sanitation research in public health domain. The

issue of improved sanitation has become a major development challenge in Ghana, especially her big cities like, Accra and Kumasi. This issue has engaged the attention of institutions as well as individuals all making efforts just to find a lasting solution to the problem. The study in the attempt to do same intends to explore appropriate strategies and recommendations to ensure good sanitation in all institutions in the Country in a sustainable manner.

Despite the immensity of the problem, very little research on sanitation has been carried out in the Colleges. The study will serve as a reference point to the District Assembly and waste management institutions as far as improved sanitation is concerned in the Colleges. In this case, it will give them an in-depth understanding of what the problems of poor sanitation are and the strategies to tackle the problem. Additionally, the study will contribute to existing body of knowledge on solid waste management in relation to sanitation and also stimulates further research on the subject in other Metropolitan Areas and Municipalities in the country.

1.7 Delimitations

The study involved only level 200 and 300 students in the college, due to unavailability of students as a result of COVID-19 Pandemic.

1.8 Limitations

This study involved only level 200 and 300 students in the College, due to unavailability of students as a result of COVID-19 Pandemic.

1.9 Organization of the Study

This report is organized into five chapters. The first chapter describes the background to the study and gives the statement of the problem as well as the purpose of the

research. It also gives the objective of the study and research questions. There is a further discourse on limitation of the study.

The second chapter is a review of related literature to the study and it discusses issues such as concept of sanitation, school sanitation, effect of poor sanitation on the environment, sanitation promotional strategy, urban sanitation, waste disposal strategy attitudinal dimension and theoretical framework among others.

Chapter Three throws light on the methodology employed in the study. It includes the study area, research paradigm, research design, population, and sample and sampling techniques used. The chapter also discusses the research instruments employed in the study, validity and reliability of the instruments used, and the procedure for data collection. It finally includes data analysis and ethical consideration.

Chapter four focuses on presentation of data, analyses of data and discussion of the results. Chapter Five gives a summary of the research findings, conclusions, recommendations and suggestion for further studies.

CHAPTER TWO

LITERATURE REVIEW

2.0 Overview

The review of related literature focuses on work done by other researchers in the field.

The topical issues under which literature was reviewed were as follows:

1. Concept of environmental sanitation
2. School sanitation
3. Effect of poor sanitation on the environment
4. Sanitation promotion strategies
5. Ghana's Environmental sanitation situation
6. Concept of health
7. Concept of hygiene
8. Urban Sanitation
9. Challenges towards improving sanitation condition
10. Waste disposal method
11. How attitude affect behaviour of people
12. General knowledge, Attitude, and Practices of people towards sanitation.
13. Sanitation and development of decision making models (Theoretical Framework)



2.1 Concept of Environmental Sanitation

Sanitation can be defined as the adoption of measures to eliminate unhealthy elements especially with regard to dirt and infections" (Shatri, Raval & Mapuskar, 2010). Since the Sanitation Revolution of the nineteenth century, according to UNEP (2005), there is a growing body of knowledge demonstrating the fact that causes and pressures of

any of today's environmental problems can be traced back, directly or indirectly, to the lifestyles, choices, values and behaviors' of local communities (Daramola, 2012). This therefore calls for a holistic approach of participation in finding solutions thereby establishing the fact that all stakeholders have a role to play in the different processes of environmental sanitation, both in terms of subsidiarity of decision-making processes and sustainability of environmental services in the community (UNEP, 2005). Currently, of the world's 7 billion people, some 2.6 billion people still lack access to improved sanitation, two-thirds of whom live in Asia and sub-Saharan Africa (WHO, 2006). And so, there is the need to shift away from simply providing centrally planned infrastructure to approaches that can help create and serve people's motivation to improve their own sanitation (WHO/UNICEF, 2013). This is because in developing countries, unimproved sanitation facilities have become the main cause of widespread and serious health problems. However, improvements in these services show few health benefits unless they are coupled with improved hygiene behaviour Masangwi *et al* (2010); Tsinda *et al* (2013).

Sanitation can also be seen as the policy and practice of protecting health through hygienic measures. In the view of the World Health Organization (WHO 2007), sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and faeces. It has been realized that improving sanitation is known to have a significant impact on health both in households and across communities (WHO, 2007). Similarly, Iheke (2010), sees sanitation as the process of keeping places clean and hygienic especially by providing a sewage system and a clean water supply. Sanitation refers to all conditions that affects the health of people in a geographical area. The word sanitation operationally refers to the maintenance of hygiene conditions, through services such as garbage collection and waste water

disposal so as not to endanger the health and welfare of people and also for the social and environmental effects, it may have on people. Throughout the world, an estimated 2.5 billion people lack basic sanitation (more than 35% of the world's population) (World Health Organization & UNICEF, 2012). Basic sanitation is described as having access to facilities for the safe disposal of human waste (faeces and urine), as well as having the ability to maintain hygienic conditions, through services such as garbage collection, industrial/hazardous waste management, and wastewater treatment and disposal. (World Health Organization & UNICEF, 2012). According to WHO and UNICEF (2012), without immediate acceleration in progress, the world will not achieve the United Nations' Millennium Development Goal (MDG) sanitation target (i.e., to halve the proportion of people without sustainable access to basic sanitation by 2015). Basic Sanitation is very important in all places and environments especially schools.

2.2 School Sanitation

School sanitation refers to hygienic practices that occur in schools. Coppens (2005) considered School Sanitation and Hygiene Education as the combination of hardware and software components that are necessary to produce a healthy school environment to develop or support safe hygiene behaviour. The author is of the view that hardware components include supply of drinking water and facilities for hand washing and safe disposal of excreta and solid waste in and around the school compound. The software components are the activities that promote hygienic conditions at schools as well as practices of school staff and children that help to prevent water and sanitation related diseases and parasites. Poor sanitation in school environment will have certain negative influences on learning. Learning in an unhygienic environment can affect learning in a lot of ways. Snel (2004) and Water Aid Uganda (2013) indicated that

“health influences learning and education influences health which is indicated in the fact that poor sanitation causes diarrhoea which keeps students in hospitals rather than in schools”. They also noted that diarrhoea kills 1.5 million children each year. It is obvious that a sick person cannot learn properly. Poor sanitation could also lead to waterborne diseases (like typhoid, cholera, etc.), infections with intestinal worms, stunted growth and malnutrition (Sharma, 2014). More than five million people die each year from diseases related to inadequate waste disposal systems (WHO, 2007). There are so many indications of poor sanitation in most institutions. The promises of school health and hygiene education programmes have not always been fulfilled by either the government or stakeholders in education (Danida, 2007).

Many school environments in most institutions are not safe for students due to neglect of the operation and maintenance of health facilities. Danida further states that schools often suffer from non-existent or insufficient water supply, sanitation and hand washing facilities, dirty and unsafe water supply, toilets or latrines that are not adapted to the needs of students particularly girls; nonexistence of hygiene education, unhealthy and dirty classrooms/school compounds among others. Also, lack of sanitation, unsafe disposal or storage of waste in/around houses and streets, and in undesignated containers may provide habitats for vectors of diseases that cause various infectious diseases including typhoid fever and diarrhoea (Ogawa, 2005). WHO (2007), estimates that 88% of diarrhoea disease is caused by unsafe water supply and inadequate sanitation and hygiene. This has led to the need for measures to be evolved that will enhance proper sanitation in schools. Smart investments in sanitation can reduce disease, increase family incomes, keep girls and boys in school, help preserve the environment, and enhance human dignity. Increasing evidence also shows that school sanitation and hygiene education programmes offer high cost

benefit (Danida, 2007). In Ghana, schools are some of the most crowded places. These conditions facilitate the spreading of micro-organisms that cause diseases. It is therefore important that environmental education on health and hygiene has to go hand in hand with physical safe and well-kept hygiene facilities to make schools safe places for students' development. At all ages, children and adolescents can be engaged actively in learning experiences that enable them to practice basic sanitation and advocate it at home and in their communities. It is also important to focus on Colleges of Education, because the training teachers are pivots on which knowledge is transmitted to future leaders. Since environmental sanitation quality standards policies are not enforced to the maximum at various institutions in the country. It has been realized that improving sanitation is known to have a significant impact on health both in households and across communities (WHO, 2007).

School sanitation also refers to hygienic practices that occur in schools. More than five million people die each year from diseases related to inadequate waste disposal systems (WHO, 2007). There are so many indications of poor sanitation in most institution. Danida further states that schools often suffer from non-existent or insufficient water supply, sanitation and hand washing facilities, dirty and unsafe water supply, toilets or latrines that are not adapted to the needs of students particularly girls; nonexistence of hygiene education, unhealthy and dirty classrooms/school compounds among others. Also, lack of sanitation, unsafe disposal or storage of waste in/around houses and streets, and in undesignated containers may provide habitats for vectors of diseases that cause various infectious diseases including typhoid fever and diarrhoea. In 2008, the world health organization's expert committee on environmental sanitation (as cited by Evans, Vandervoorden & Peal, 2009) said that proper environmental sanitation involves the control of

community water supplies, excreta and waste water disposal, refuse disposal, vectors of diseases, housing conditions, food supplies and handling conditions, atmospheric conditions and the safety of the working environment. Meanwhile the world needs for the basic sanitation services like drinking water supply, excreta and waste water disposal, have greatly increased as a result of rapid population growth and higher expectations (Thor, 2005). Thor further opined that a major way of solving environmental issues is the encouragement of research in environmental sanitation. However, providing sanitation to students requires a system approach rather than only focusing on the toilet or water waste treatment plan (Tilley, Ulrich, Lüthi, Raymond, & Zurbrügg, 2014). Sanitation system generally involves faeces collection, transport and treatment (Sustainable Sanitation Solutions, 2008). The main objectives of a sanitation system is to protect and promote human health by providing a clean environment and breaking the cycle of disease. In choosing the particular system to use, a lot of factors have to be considered.

The factors to be considered include; experience of the user, excreta and wastewater collection methods, transportation or conveyance of waste, treatment and reuse or disposal of wastes. Not minding the type of system chosen, sanitation is of various types. The various types of sanitation include, community led total sanitation, dry sanitation, ecological sanitation, and environmental sanitation. (AKUT Sustainable Sanitation, 2014 as cited in Sanni, 2015). The author went further to give a brief description of each of the types. Community-Led Total Sanitation (CLTS) is an approach to achieve behaviour change in mainly rural people by a process of triggering behaviour change, leading to spontaneous and long-term abandonment of open defecation practices. CLTS takes an approach to rural sanitation by ensuring communities recognize the problem of open defecation and take collective action to

clean up and become "open defecation free. The second type called dry sanitation usually means sanitation systems with dry toilets which have urine diversion, in particular the urine-diverting dry toilet. The third type called the Ecological sanitation commonly abbreviated to Ecosan, is an approach, rather than a technology or a device which is characterized by a desire to "close the loop" (mainly for the nutrients and organic matter) between sanitation and agriculture in a safe manner. Put in other words, Ecosan systems safely recycle excreta resources (plant nutrients and organic matter) to crop production in such a way that the use of non-renewable resources is minimized. When properly designed and operated, Ecosan systems provide a hygienically safe, economical, and closed-loop system which converts human excreta into nutrients to be returned to the soil, and water to be returned to the land. Finally, Environmental sanitation encompasses the control of environmental factors that are connected to disease transmission. Subsets of this category are solid waste management, water and wastewater treatment, industrial waste treatment and noise and pollution control.

In the context of this work, environmental sanitation is used interchangeably with sanitation. This is because it is the particular type of sanitation of particular interest to institutions. Environmental sanitation encompasses four major subsets which include; solid waste management, water and wastewater treatment, industrial waste treatment and noise and pollution control. There has been considerable awareness of water supply in institutions, but the problems of excreta and waste disposal have received less attention (Danida, 2007). In the Colleges of Education a lot of places are littered with pure water polythene, pieces of papers and so on. In the halls of residents, there are problems of overcrowding and these affects the health of the students in the halls. Many students share few toilets which leads to the spread of diseases among students.

As a result learning is usually affected because a sick person only thinks of how to get cured and not what to learn in the classroom.

2.3 The Effects of Poor Sanitation on the Environment

In regions where a large proportion of the population is not served with adequate water supply and sanitation, sewage flows directly into streams, rivers, lakes and wetlands, affecting coastal and marine ecosystems, fouling the environment and exposing millions of children to disease. Particularly in the context of urbanization, domestic wastewater, sewage and solid waste improperly discharged presents a variety of concerns from providing breeding grounds for communicable disease vectors to contributing to air, water and soil pollution. The results of poor waste management also contribute to a loss of valuable biodiversity. In the case of coral reefs, urban and industrial waste and sewage dumped directly into the ocean or carried by river systems from sources upstream, increase the level of nitrogen in seawater. Increased nitrogen caused overgrowths of algae, which in turn, smother reefs by cutting off their sunlight. Improved sanitation reduces environmental burdens, increases sustainability of environmental resources and allows for a healthier, more secure future for the population.

2.4 Sanitation Promotion Strategies

In promoting sanitation therefore several strategies have been developed by different groups and countries aimed at achieving the Millennium Development Goals. These strategies have varied over time with improvements as the years go by (Government of Nepal Sanitation and Hygiene Master Plan, 2011). This wide range of innovative approaches has been applied in low-income countries. Even though some have shown that peoples demand and interest in sanitation is low, the truth is that many people

would want to have sanitation facilities but often cannot afford the cost of what is being offered them. Therefore, there is the need for a change in the way sanitation provision is dealt with; the product must be affordable and appropriate (Cairncross, 2010). Documented strategies include a wide range of innovative approaches which have been applied in low-income countries, including participatory initiatives such as the Participatory Hygiene and Sanitation Transformation tool (PHAST), Community-Led-Total-Sanitation (CLTS) and Community Health Clubs (CHCs). School-based and child-friendly hygiene and sanitation programmes are also widely used in low-income settings (Jenkins and Scott, 2007). Similarly, social marketing approaches, such as promotion of hand washing with soap and using marketing approaches to selling sanitation, are gaining popularity (World Bank EHP, 2005). CLTSs are aimed at promoting self-respect and not merely promoting standards or health issues (Harvey & Mukosha, 2008).

This is to give sanitation a different approach other than what professionals in the sector have concentrated on over the years as termed as “intellectual constipation” (Karr & Pasteur, 2005). After evaluating works on different approaches all over the world, the World Bank Water and Sanitation Programme (2005) discovered that many of the strategies severely lacked rigorous evaluations and intervention trials. They further analyzed three strategies: PHAST which uses a participatory approach or methodology to whip up active participation of those who must benefit from the development process, CHCs which comprises health education and community mobilization, aims at enabling people to improve their own hygiene practices and Happy Healthy and Hygienic/ Programme Saniya which targeted risk factors identified for attention in hygiene promotion (Curtis & Kanki, 1998).

2.5 Ghana's Environmental Sanitation Situation

As already indicated, epidemiological investigations have indicated that even in the absence of latrines that have been the concentration of sanitation strategies, diarrhoea morbidity can be reduced considerably with the adoption of improved hygiene behaviour (WHO, 1999). According to NESSAP (2010), there is limited report on the sanitation in totality from all over the nation. Even though WASH (water, sanitation and hygiene) is a single sector, there has been little progress in achieving access to sanitation because there has been more concentration on water and hygiene (Loevinsohn, Guerrero, & Gregorio, 1995). Many Metropolitan, Municipal and District Assemblies (MMDAs) who are directly tasked with the responsibility of sanitation are plagued with problems such as “poor planning for waste management programmes, inadequate equipment and operational funds to support waste management activities, inadequate sites and facilities for waste management operations, inadequate skills and capacity of waste management, uncoordinated attitudes and the apathy of the general public towards the environment” (Atuahene, 2010; p. 49).

There are other barriers such as neglect of consumer preferences, lack of political will, inappropriate approaches and low prestige and recognition for sanitation workers (WHO Sanitation Promotion Handbook, 1998; p. 11-12). On a general note, the sanitation situation in most parts of Ghana can best be described as a crisis. “It is as shocking as AIDS, as debilitating as Malaria, and as solvable as Polio. Simply meeting the sanitation target by 2015 could avert 391 million cases of diarrhoea a year (and with them the loss of years of schooling, and years of productive and social life)” (Evans et al; 2004), further projecting for any nation \$63 billion every year in economic gains simply by meeting the targets of the MDG on sanitation. Even though

the cost of doing so may be high, the benefits can actually dwarf the cost (Hutton, Haller & Bartram, 2007). Schools are very important public places that demand a lot of attention when it comes to sanitation. The already available challenges are further being compounded by rapid population levels which result in generation of large amounts of waste and stress on available sanitation hardware Minghua et al (2009). No matter the challenges, the effect of poor sanitation is enough to make it worth paying attention to. In Ghana for instance, a lot of attention has been devoted to policy formulation and regulatory frameworks towards promoting sanitation (Fried, n.d).

Between 1991 and 2010, there have been policy documents, waste management, environmental guidelines, and legislative instruments that include issues on sanitation. They include the Local Government Act, 1993 (Act 462); Water Resources Commission Act, 1996 (Act 522); Environmental Sanitation Policy, 1999; Environmental Assessment Regulations, 1999 (LI 1630) National Building Regulations, 1996 (LI 1630) Landfill Guidelines (2002); Guidelines for the Management of Health Care and Veterinary Waste in Ghana (2002); Revised Environmental Protection Agency, 2007 and Environmental Sanitation Policy, Revised, 2010. (Environmental Sanitation Policy, Revised, 2010). In these documents, specific actions that must be taken as well as specific roles have been assigned to all stakeholders such as the state, the municipal assemblies, communities, NGOs, individuals, Ministry of Health, educational institutions, the private sector, research institutions among others. Even though policy on environmental sanitation abounds, failure is the norm for urban sanitation infrastructure in Ghana (Murray & Drechsel, 2012). This coupled with other challenges have had wrong bearings on the implementation of successful programmes (WHO Sanitation Promotion Handbook,

1998, p. 13). “Ghana is a typical ... sub-Saharan African country facing significant sanitation challenges” Amoah, Dreschsel, Abaidoo, & Henseler (2007). In 2010, the Environmental Health and Sanitation Directorate of Ministry of Local Government and Rural Development developed a document known as National Environmental Sanitation Strategy and Action Plan (NESSAP). It referred to the waste generated as ‘Materials in Transition’ (MINT). MINT is aimed at creating awareness for the change of sanitation-behaviour; changing people’s attitudes towards all types of wastes as a life-style. MINT looks at the potential of waste management in the creation of jobs as well as the reduction of cost in waste management (NESSAP, 2010).

NESSAP therefore covers all components of environmental sanitation. It is to guide all actors in the various sectors such as the Ministries, Departments and Agencies (MDAs), Metropolitan, Municipal and District Assemblies (MMDAs), NGOs, development partners, traditional authorities and even the media. MINT is the underlying philosophy for creating awareness for change of attitude towards the handling and disposal of all types of waste by demonstrating that there is value in all the components of wastes. MINT will create “green collar” jobs and has the potential to reduce MMDAs cost for waste management. With the philosophy of MINT, therefore, waste is simply not discarded. Value is added at the various stages of its transition till it gets to its last end.

However, the Strategic Youth Network for Development (SYND), a youth-led NGO advocating for sustainable environment in the areas of Climate Change, Biodiversity, Land Degradation and Water and Sanitation, contend that the policy does not make provision for the active involvement of young people in the processes even though the

youth constitute the largest segment influencing the sanitation situation in Ghana (Strategic Youth Network for Development (SYND), 2013). That notwithstanding, the SYND considers the issue of environmental sanitation as affecting every part of human development such as the economy, culture, health, employment among others. It further calls on all stakeholders to help in successful implementation of the policy. This is further corroborated by CHF International, Ghana (2010), in its analysis of the value chain of solid waste management as a programme for Youth Engagement in Service delivery (YES) programme in Accra. Waste management presents employment opportunities for young people (Theme, 2010). Of the many concerns raised in the Environmental Sanitation Policy, Revised, 2010), is the sanitation situation in schools placing the responsibilities on Metro/Municipal Environmental Health Departments who among other responsibilities must ensure food and water hygiene comprising school sanitation, food establishments, meat and fish hygiene, control of fresh vegetables and water quality control (Environmental Sanitation Policy, Revised, 2010, p. 39). The policy categorically stated that District Assemblies shall ensure the availability of suitable and hygienic facilities. The private sector shall be encouraged to build and manage such facilities.

Provision for the handling, display and preservation of meat, fish and other perishable foods shall be such as to prevent contamination and decomposition. It therefore encourages capacity development, information education and communication, legislation and regulation, sustainable financing and cost recovery, levels of service, research and development and monitoring and evaluation as key to sanitation promotion by the Assemblies (NESSAP, 2010, p. 49). This is indicative of the collaborative nature in sanitation promotion meaning that the various stakeholders

play their role with the deserving urgency (Rheinlander, Samuelson, Dalsgaard & Konradsen, 2010).

2.5.1 Current practice to improve sanitation condition

A landfill site also known as tip, dump or rubbish dump was historically a hidden site for the disposal of waste materials by burial. Landfill is the oldest form of waste treatment. Historically, landfills have been the most common methods of organized waste disposal and it has remained so in many places around the world. Landfills may include internal waste disposal sites where a producer of waste carries out their own waste disposal at the place of production as well as sites used by many producers. Many landfills are also used for waste management purposes, such as the temporary storage, consolidation and transfer, or processing of waste material sorting, treatment, or recycling (Hickman & Eldredge, 2005).

Landfills are often established in abandoned or unused quarries, mining voids or borrow pits. A properly-designed and wellmanaged site for landfill can be hygienic and relatively inexpensive method of disposing of materials. Older, poorly-designed or poorly-managed landfills created a number of adverse environmental impacts. There were number of concepts about waste management which vary in their usage between countries or regions. Some of the most, general, widely used concepts referred to the '3 Rs', Reduce Reuse and Recycled which classified waste management strategies. Solid wastes included industrial wastes, construction wastes, agriculture wastes, house garbage, sludge, excrements, and medical wastes and so on. These specifications were according to their desirability in terms of waste minimization. The waste hierarchy remained the cornerstone of most waste minimization strategies. The aim of the waste hierarchy was to extract the maximum

practical benefits from products and to generate the minimum amount of waste (WHO, 2002). Existing final disposal sites for municipal solid waste were also not engineered and may be described as crude dumpsites. There was no waste separation (the innovation in this study) at the source of generation and hazardous waste was often handled together with municipal solid waste (UN MDG, 2009).

In Europe and a few other places around the world, a few communities used appropriate collection system known as Envac, which conveyed refuse via underground conduits using a vacuum system. Different definitions were combined in order to ensure the safe and legal disposal of the waste (New York Daily Newspaper, 2007). The European Union started a discussion that would end in an End-of-Waste directive which would clarify the distinction between waste that should be treated for disposal and raw materials that could be reused for the same or other purposes. The packaging of product used has been a major contributor of the waste generated. Therefore buying products with minimal packaging would reduce our waste (New York Daily Newspaper, 2007). Land filling practices in the UK have had to change in recent years to meet the challenges of the European Landfill Directive. The UK imposed landfill tax upon biodegradable waste which was put into landfills. In addition to this Landfill Allowance Trading Scheme was established for local authorities to trade landfill quotas in England. A different system operated in Wales where local authorities were unable to trade between themselves, but had allowances known as the Landfill Allowance scheme. In recent years, some countries, such as Germany, Australia, Belgium, the Netherlands, and Switzerland, have banned the disposal of untreated waste in landfills. In these countries, only the ashes from incineration or the stabilized output of mechanical biological treatment plants might be deposited (Hickman and Eldredge, 2005). In Canadian urban centres, curb side

collection was the most common method of disposal, whereby the city collected waste and /or organics on a scheduled basis.

In rural areas people often disposed of their waste by hauling it to a transfer station. Waste collected was then transported to a regional landfill. In Taipei the city government charged its households and industries for the volume of rubbish they produced. Waste was collected only by the city council if it was disposed in government issued rubbish bags. This policy successfully reduced the amount of waste the city produced and increased the recycling rate (WHO, 2003). In the United State landfills were regulated by the state's environmental agency that established minimum guidelines. However, none of these standards fell below those set by the United States Environmental Protection Agency (EPA). Example was the case of the Fresh Kills Landfill in Staten Island, which was claimed by many not only to be the world's largest landfill, but the world's largest human structure. The landfill had been closed and it is being transformed into a park (Hickman and Eldredge, 2005). There has been large variety of composting and digestion methods and technologies varying in complexity, from simple home compost to industrial-scale enclosed-vessel digestion of mixed domestic waste for mechanical or biological treatment. Methods of biological decomposition were differential as being aerobic, though hybrids of the two methods also existed (WHO, 2003). A section of a landfill located in Barclay, Ontario has been one of several landfills used by Dryden, Ontario. Typically, in non-hazardous waste landfills, predefined specifications and techniques were applied by which the wastes were:

- Confined to as small as possible area.
- Compacted to reduce their volume.
- Covered usually daily with layers of soil.

During landfill operations the waste collection vehicles were weighed at a weigh bridge on arrival.

2.6 Concept of Health and Hygiene

The 'healthy city' concept has been adopted in developing countries. From 1995 to 1999, the World Health Organization in Geneva supported Health City Projects (HCPs) in Cox's Bazar in Bangladesh, Dar es Salaam in Tanzania, Fayoum in Egypt, and Managua in Nicaragua and Quetta in Pakistan. The authors evaluated four of these projects, representing the first major evaluation of HCPs in developing countries. Methods used were stakeholder analysis, workshops, document analysis and interviews with one hundred and two managers/ implementers and one hundred and three intended beneficiaries. Municipal health plan development in Europe used the 'settings' approach of the healthy concept, whereby places such as markets and schools were targeted. The evaluation found that stakeholder involvement varied in relation to the level of knowledge of the project and the type of activities ranging from low stakeholder involvement among other things (Burton et al., 2000). It was also established that there was limited political commitment to the Healthy City Projects, perhaps due to the fact that most of the municipalities had not requested the projects.

World Health Organization support enables the project coordinators to network at national and international levels (Burton et al., 2000). There had been increasing recognition within the international community that improving the health of poor people across the world depended on adequate understanding of the socio-cultural and economic aspects of the context in which public health programmes were implemented (WHO, 2010). The health agency supports the view of the WHO (2010) that 'health' is a state of complete physical, mental and social well-being but not merely the absence of disease or infirmity. They agreed that health is a fundamental human right and the attainment of a highest possible level of health was crucial

(Lancet, 2010). Generally people who have a duty to promote health saw it as resource for everyday life and not the object of living. It was a positive concept that emphasizes social and personal resources and physical capabilities (Lancet, 2010). In rural areas and small towns, there are often no vehicles for collection of waste, hence uncontrolled dumping occurs within the built up areas with all its attendant health hazards and negative environmental impact (Mensah, & Larbi, 2005).

The role of the researcher, therefore, is to assume the participants' point of view by exploring the subjective experiences of health, and to understand and interpret the meanings that make certain behaviours and opinions acceptable (Gatrell & Elliott, 2009). Hygiene is the act of adopting safer practices in the communities to prevent sanitation related diseases (UN-HABITAT, 2003). There are some tangible components of health composed by specialist in preventive medicine. They called sanitation a state characterized by psychological integrity (Johnson, 2000).

According to Stokes, Noren and Shindell (2000) this implies the ability to perform personally valued family work, and community roles as well as the ability to deal with physical, biological, psychological and social stress (Johnson, 2000). This generates the feeling of well-being and freedom from the risk of disease and untimely death (Stokes, Noren & Shindell, 2000). If institutions see hygiene as a way to guaranteed wellbeing and long life, they will make efforts to put in place proper hygiene measures in their everyday life.

2.6.1 The Health Belief Model (HBM)

Strecher, et al. (1997) described Health Belief Model (HBM) as a theory that explains why people do or do not engage in preventive health measures, such as getting tested for a disease, eating healthy food and exercising, or keeping their environment clean.

It is one of the models which adopted theories from other disciplines and one of such is the behavioural science to study health problems. Redding, et al. (2000) argued that it is one of the most widely recognized and used models in health behaviour applications. Slovic (2000) also intimates that the model explains why people would or would not use available preventive services. The presupposition is that people who feared diseases are influenced by the type of health activities they do. This is seen in the degree of fear (perceived threat) and the expected fear reduction actions so far as that supposed reduction seemed to outweigh practical and psychological barriers to taking action (net benefits) (Slovic, 2000). The researcher thinks that the fear of diseases is not enough for people to engage in activities that will prevent them, but the awareness that certain preventive activities can help reduce the threat is important. Hence should the market users at Dome be equipped with knowledge about activities that can prevent waste related diseases, they will engage in them to prevent diseases. Strecher, et al. (1997) as stated in Redding et al. (2000), explain four expectations that exemplify the HBM. These expectations correspond to the perceived threat of the illness and expected outcome as discussed below.

2.6.2 Perceived susceptibility

This refers to how much individuals believe that they are vulnerable to or at risk for some illnesses. In relation to this study, if market users in Dome believe that the poor way of managing waste generated in the market poses a risk and that they are at risk to such health hazards then their attitude will change. They will thereby adopt good sanitation practices based on the knowledge that they are vulnerable. For instance making them aware that plastic waste which does not degenerate easily tends to block culverts, leaving in its wake stagnant water that can cause floods and also serve as a breeding place for mosquitoes, that lead to the high incidence of malaria cases,

typhoid, cholera and other contagious diseases will make them to adopt practices aimed at avoiding these negative outcomes.

2.6.3 Perceived severity

This refers to how serious the individual believes the consequences of being ill are. The study bears on the presupposition that if the market users know that the risk associated with poor sanitation can be fatal, they will change their attitude and engage in practices that improve sanitation in the market. For example, if the market users know that dirty surroundings breed flies which settle on food items and make them unwholesome and cause a deadly disease like cholera, they will change their attitude.

2.6.4 Perceived effectiveness

This refers to the expected benefits if one engages in the protective behaviour. Fitting this into the study, if Dome market users realize that by disposing of waste, especially plastic waste in the market will actually reduce the risk of contracting sanitation related diseases they are more likely to engage in proper sanitation practices. To this end, the market users will be healthy and go about their daily activities without let or hindrance.

2.6.5 Perceived cost

This refers to the barriers or losses that interfere with health behaviour change. Referring to the barriers and losses that can impede the practice of proper waste management, especially plastic waste, allusion is to the perceived time waste, financial burden and inadequate information on the expected gain associated with improved sanitation practices. For instance, when market users in Dome market think that practicing proper waste management is relatively time consuming, drawing on their finances or that the practice would not yield any tangible benefits, they are not

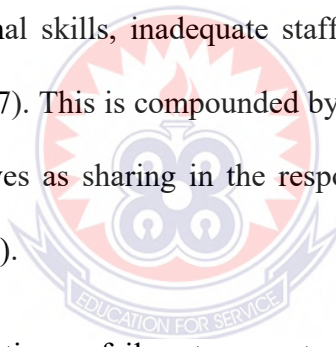
likely to be motivated to change their attitude and practices despite their awareness of proper waste management. As in the economics literature, according to Mosse (2000) it is assumed that the preventive action will be taken only if the expected benefits outweigh the expected costs. The role of demographic and social variables (called mediating factors) can indirectly affect behaviour by influencing an individual's perceptions of susceptibility, severity, benefits and costs. This can apply to the Dome market where market users fit into the four aforementioned expectations. A systematic review of studies regarding people's behaviour and environmental sanitation had used the Health Belief Model among adults into the late 1980s and found it lacking in consistent predictive power for much behaviour, sometimes due to its limits of scope to predisposing factors (Harrison, Mullen, and Green, 1992). Mullen, Hersey, and Iverson, (1978) also found the model to account for a smaller proportion of the variance in diet, exercise, and other behaviours than did the theory of reasoned action, theory of planned behaviour, and the precede-proceed.

2.7 Urban Sanitation

Egun (2011) posited that urban authorities are faced with many problems which they seem incapable of managing or dealing with. Most of these problems often accompany urbanization and one of the areas where they face a challenge is waste management. Waste is generated from residential, commercial, institutional and industrial sources and consists of paper, plastic, glass, cloth, metal and organic materials (Gangwar, Deepali & Gangwar, 2012). Urban Centres' face several sanitation problems including Waste Electrical and Electronic Equipment (WEEE), Biodegradable Organic Fraction (BOF) which constitutes the largest proportion of solid waste, wastewater, faecal sludge among others (MLGRD, 2010). The rate at

which waste generates and accumulates is fast becoming a major environmental health problem in developing countries (Shatri, Raval & Mapuskar, 2010).

Indeed, sanitation is a complex issue that is linked not only to health but to social and economic development as well (Daramola, 2012). That makes it an „essential service“ (Environmental Sanitation Policy, Revised, 2010). Even though there are several approaches, they are mostly geared towards rural sanitation. Much must therefore be done with regard to urban sanitation which is plagued with many challenges (DFID, 2009). In many countries, the collection and disposal of waste is seen solely as the responsibility of the government or the municipal assembly which are unable to execute this successfully due to several difficulties including financial constraints, low level of organizational skills, inadequate staffing among others (Global Waste Management Report, 2007). This is compounded by the majority of the populace who do not consider themselves as sharing in the responsibility of waste collection and disposal (Onibokun, 1999).



Meanwhile, lack of sanitation or failure to execute sanitation strategies does not only threaten the health of the people but a threat and a burden to the environment itself (Samanta & Wijk, 2013). Sanitation in urban areas has become a basic necessity for improvement of the quality of life as well as the enhancement of efficiency of the people in their endeavour countries (Shatri, Raval, & Mapuskar, 2010) The complex nature of urban sanitation calls for facilities and services that are cost effective and sustainable. Although many governments in collaboration with other stakeholders are making considerable uphill challenges to properly manage their waste. Most efforts are now being targeted at reducing the final volumes as well as generating sufficient funds for waste management (Ram, Reddy, Rao & Reddy, 2004). This problem has

arisen because of the fact that sanitation has received less attention than water and hygiene even though they have always been seen as a single concept (Harvey, 2008).

According to the UNDP Human Development Report (2006), even though sanitation is improving worldwide, same cannot be said of sub-Saharan Africa. Therefore, there is the need to work towards the communities' understanding of the problem in order to encourage their collective participation. This can lead to the collective transition of local residents from victims to agents of change (Daramola, 2012). Monte (2008) argues that, among other things, low income countries are unable to address their urban sanitation challenges due to policy weaknesses. Other challenges include inadequate data that must direct the provision of services (Konteh, 2008).

2.8 Challenges towards Improving Sanitation Conditions

The greatest challenge of improving sanitation lied in the urban areas and informal sector (Dougall & McGahey, 2003). A study performed with stakeholders on sanitation to understand perception of sanitation challenges suggested that stakeholders' perspective was one of the greatest challenges towards the attitude of residents. In their opinion, there was the need to make education and awareness raising paramount, regarding the connection between sanitation, behaviour and health as pertinent actions. Capacity buildings, human resources, competitive involvement of the private sector were also raised. Nostrum was also mentioned as challenging areas that the assembly needed to develop further (Owusu & Roojen, 2008). It is agreed that, source separation and resource recovery is an important method in waste management. This is because there is nothing like waste on this earth. Wastes that are discharged may be of significant value in another setting, but they are of little or no value to the producer who wants to dispose of it.

According to Tsiboe and Marbel (2004), Austria, the Netherlands, and Denmark developed a waste management processes to efficiently resolve the waste disposal problem by essentially coaxing their citizens to separate their domestic solid waste into glass, paper, plastic categories; thereby enabling easy collection and consequently reuse. As suggested by the three authors, one way of effectively managing solid waste is to minimize solid waste generation through source reduction.

Another problem of improving sanitation was that people refused to talk about sanitation as responsibility for all. So what was seen as solely the responsibility of others when it was for all could not be improved upon unless that attitude was altered or changed. Until discussed and personalized we cannot improve it (National Environmental Sanitation Policy Coordination Council NESPOCC, 2008). The open dumping areas could create health problem, as it led to multiplication of rodents and flies. Open dumping might result in the generation of anaerobic gases, which led to creation of bad odour primarily resulting in a variety of diseases. There were persistent complaints from people residing near open dumping areas. Health care establishment premises with poor solid waste management were prone to spreading diseases (ENVIS Centre, 2010). The World Toilet Organizations (WTO) started the World Toilet Summit, an annual international conference for all people in the toilet and sanitation field to meet in 2008. The purpose was to exchange knowledge and experiences. It was held in 2001 at Singapore, 2002 in Seoul, 2003 in Taipei, 2004 Beijing, 2005 Belfast, 2006 Moscow, and 2007 New Delhi. Every event was sponsored by the respective local governments as WTO gave them the hosting rights. People were so inhibited against the subject “sanitation”. Second was inability to develop and use skills in managing waste into useful materials. There was no such thing as human waste.

Our excreta are actually nutrients and good fertilizers. The third challenge was government's inability to provide enough funds for managing waste. The WTO drove a market and institutional-based strategy as donors funding were not the long term solution. Inadequate public education was another challenge and need for proper environmental sanitation and how waste could be managed. The filthy condition was a result of ignorance and non-enforcement of the law.

Apparently, the laws that govern sanctions on living and working in unsanitary condition were either unknown or not enforced (NESPOCC, 2008). Solid waste, these rivers that acted as open sewers, posed serious threats to public health in the densely built areas of the urban cities (Sam, 2009). In developing countries such as Ghana, there were many communities, which were unplanned and were occupied by squatters and illegal settlement. Growth of grass and weeds were common sights in many sections of various river channels. This naturally resulted in retardation of flow and consequent flooding of the banks of the rivers during heavy storm. During dry weather the grass and weeds caused ponding in several sections, which provided breeding grounds for mosquitoes. The relative impact was human suffering, diseases epidemic, poor sanitation health, stress, and disruption of commercial activities and normal activities.

Clearly, the existing system could not cope with the ever-increasing volume of solid waste being generated in Ghana. Therefore, the public disposed of rubbish indiscriminately especially in watercourses and drainage channels and often through burning. Huge piles of refuse as overflowing refuse containers are seen throughout the urban centers particularly near markets, school environment and squatter settlements (Ghana Meteorological Service GMS, 1995) Forty percent of the world

population, 2.5 billion people, had no access to basic sanitation. This post looked at some of the challenges and opportunities that laid them. The vast majority of those without access resided in Asia and sub-Saharan Africa where the regional access rates fell to as low as fifty three percent and thirty one percent respectively (Earth Trends, 2003).

Flooding in Accra had become a perennial phenomenon. In Accra, low lying areas were subjected to severe perennial flooding, which was generally attributed to inadequately sized culverts and blockage of the major drains by cumulated silt caused by years of neglect and lack of maintenance (Nyamekye, 2012). There was also the effect of tidal variations on rivers and streams leading to flooding. The effects of variations of the hydro climate conditions led to flooding (Wohl, 2011). This could be attributed to the variation and the spatial context of regional, local, and global atmospheric processes and circulation patterns from which the floods developed (Hirschboeck, 1988). The capacities of most rivers have been greatly reduced by the deposition of silt and garbage and growth in and along the riverbanks (Lavallin, 1996). While existing solid waste disposal facilities were inadequate to deal with the quality and quantity of waste generated, sophisticated systems such as incineration and biogas production were not in use as these entail a high level of technology. Besides maintenance requirements were high.

Accra Metropolitan Assembly's urban run-off contained varying quantities of all the following, depending on the location where the runoff was generated. Notably among them were floatable and visual contaminants, degradable organics, suspended solids nutrients, bacteria, and virus toxicants and dissolved solids. Floatable and visual contaminants were for the most part as a result of improper solid waste disposal.

Plastic bags and bottles were the commonest items to be found in urban runoffs. By far the most worrying contaminant of the wastes generated. Indiscriminate defecation in drains, open space water courses and dump sites were common, giving rise to excreta-related diseases, and generally posing a health hazard to the public. During storm events, liquid waste along with runoffs into areas of human settlements and water sources. At public toilets, holding septic tanks often overflowed during rainy seasons to compound the problem further. The other principal attribute to flooding was illegal settlements and construction of housing structures within flood plain (Tucci, 1999).

2.9 Waste and Disposal Methods

Waste can be described as things we do not want or things we fail to use (Health Foundation of Ghana, 2009). The sources of waste include domestic, industrial and agricultural activities. The more waste we generate, the more we have to dispose of. The disposal of garbage in the world is a problem that continues to grow with the development of industrialized nations and the growth of population (Bassis, 1998). Since the beginning of time people have needed to find a way of disposing of their waste (Baum & Parker, 1974). In the past, most waste were sent to the outskirts of town or placed in pits dug in houses to decompose. Man has however, come far and developed waste that cannot be simply thrown into pits. Most of the things used now are made of plastics which are difficult to dispose of.

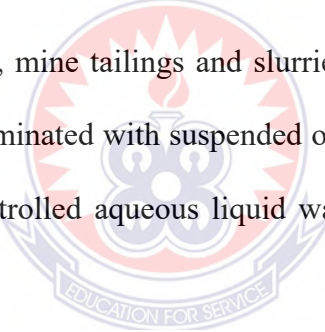
Waste can be divided into many different types. The most common methods of classification, according to Bassis (1998), are by their physical (solids, liquids and gases) chemical and biological characteristics. One important classification is also by their consistency.

Solid wastes are waste materials that contain less than 70% water. This class includes such materials as household garbage, some industrial wastes, some mining wastes, and oilfield wastes such as drill cuttings. According to the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP, 2000), solid waste can be classified into four which are municipal solid waste, industrial waste, agricultural waste and hazardous waste. Accordingly, municipal solid waste is generated from households, offices, hotels, shops, schools and other institutions. The major components are food waste, paper, plastics, rags, metal and glass. Demolition and construction debris, small quantities of hazardous waste such as electric light bulbs, batteries, automotive parts, discarded medicines and chemicals are often included in the collection (UNESCAP, 2000).

Industrial waste according to UNESCAP (2000) encompasses a wide range of materials of varying environmental toxicity. The range include paper, packaging materials, waste from food processing, oils, solvents, resins, paints and sludges, glass, ceramics, stones, metals, plastics, rubber, leather, wood, cloth, abrasives etc. Agricultural wastes include livestock waste, crop residues and agro-industrial by-products. The principal types of hazardous waste include waste solvents, chlorine bearing waste and pesticide; organophosphate-herbicide-urea-fungicide hearing waste. Hazardous wastes have at least one of the following characteristics: corrosively, ignitability, reactivity, and toxicity (Environmental Protection Agency-Ghana, 2003).

Liquid wastes are usually wastewaters that contain less than 1% solids. Such wastes may contain high concentrations of dissolved salts and metals (Bassis, 1998). Liquid wastes according to the Department of Environment and Conservation is classified

into four groups; hazardous, group A, group B, group C and non-controlled aqueous liquid. Hazardous liquids include explosives, flammable liquids, corrosives, radioactive liquids etc. Group A includes controlled aqueous liquid waste and non-aqueous liquid waste that is water containing larger quantities of dissolved chemicals such as oils, solvents and solvent-containing liquids that are not classified as hazardous. Group B includes wastewaters containing larger quantities of effluents or nutrients such as liquid food waste and waste resulting from the preparation or manufacturing of food (Department of Environment and Conservation, 1999). Group C includes liquid waste from human waste storage facilities or waste treatment devices. Non-controlled aqueous liquid waste are wastewaters containing large quantities of filterable and/or non-filterable solids that are not hazardous, group A, B or C such as dredge spoil, mine tailings and slurries. Non-controlled aqueous liquid waste should not be contaminated with suspended or dissolved chemicals to an extent of being classified as controlled aqueous liquid waste (Department of Environment and Conservation, 1999).

The logo of the University of Education, Winneba, is a circular emblem. It features a central shield with a book and a torch, surrounded by a wreath. The text 'UNIVERSITY OF EDUCATION, WINNEBA' is written around the top inner edge of the circle, and 'EDUCATION FOR SERVICE' is written along the bottom inner edge.

Sludge is a class of waste between liquid and solid. They usually contain between 3% and 25% solids, while the rest of the material is water dissolved materials (Bassis, 1998). Sludge can also refer to the settled suspension obtained from conventional water treatment (EPA, n.d). According to a website of the US EPA, it is a soupy material that contains significant quantities of interstitial water that is between the solid particles (Gerba, 1986). Again excess solids from biological processes such as activated sludge, (treating sewage and industrial wastewaters using air and biological floc, bacteria and protozoans) is also referred to as sludge (Dorn, Reddy, Lamphere, Gaeuman, Lanese, 1985). Sludge is classified as class A and B (EPA, n.d). Class A sludge is typically dried and pasteurized and class B is undigested and volatile. Class

B sludge may cause people close to it to experience asthma due to bio-aerosols that are released from it (Dorn *et al.*, 1985). Both classes of sludge may contain radioactive or pharmaceutical waste.

Gaseous wastes are uncontained airborne emissions and effluents, that may consist of particulate matter, dust, fumes, gas, mist, smoke, vapour or any combination of aforementioned (Wikipedia, 2011). Gaseous wastes according to EPA may be classified as hazardous and non-hazardous. They are primarily generated by combustion (e.g., internal combustion engines, incinerators, coal-fired electrical generating plants) and industrial processes. Depending on their characteristics, gaseous wastes can be odiferous or toxic (Siegel, 1993). Some are implicated in global warming, ozone depletion, and smog. Gaseous wastes may be released to the atmosphere or captured/treated with pollution control equipment (Davies & Cornwell, 1998).

Radioactive wastes according to the EPA (2003) emit particles or electromagnetic radiation (e.g., alpha particles, beta particles, gamma rays, and x rays). Radioactive wastes can be high level, transuranic, or low level (Davies & Cornwell, 1998). High-level radioactive wastes are from spent or reprocessed nuclear reactor fuel. Transuranic wastes are from isotopes above uranium in the periodic table. They are generally low in radioactivity, but have long half-lives. Low-level wastes have little radioactivity and can often be handled with little or no shielding. Radiation can damage living cells and cause cancer.

Management of wastes and/or disposal of wastes are a major problem for most cities. There are several waste disposal methods such as open dumping at dumpsites, land filling, incineration, composting, etc. (Davies & Cornwell, 1998; UNESCAP 2000). Some methods of waste disposal, such as open dumping and land filling, release air

pollutants and greenhouse gases into the atmosphere (Davies & Cornwell, 1998). Waste recycling offers one means of reducing the impacts of waste disposal on the atmosphere, but there are other methods of waste disposal which are more environmentally friendly (Bassis, 1998).

The most common disposal methods are open dumping, landfill and to a lesser extent incineration. Some waste from sewage sludge is also placed in landfill sites, along with waste from mining and quarrying. As open dumpsites and landfill waste decomposes, methane is released in considerable quantities. Methane is a strong greenhouse gas and contributes to global warming (Hesperian Foundation & United Nations Development Programme, 2005). Furthermore, the leachate fluids formed from decomposing waste permeate the underlying and surrounding geological strata, polluting groundwater which may be used for drinking water supplies (Bassis, 1998). Containment landfills however can limit the spread of this waste leachate.

Incineration is the second largest waste disposal method in most countries. In the UK, approximately 5% of household waste, 7.5% of commercial waste, and 2% of industrial waste is disposed of by incineration (Bassis, 1998). When burning waste, a large amount of energy, carbon dioxide and other potentially hazardous air pollutants are given off (burning of waste is a common practice in Ghana). Modern incinerators however, can harness this waste energy to generate electricity and hence prevent the energy from being wasted (Davies & Cornwell, 1998). Incineration plants range from large scale, mass-burn, and municipal waste incinerators to smaller clinical waste incinerators used in hospitals.

A less common but more sustainable method of waste disposal is anaerobic digestion (composting). In this process organic waste decomposes in an enclosed chamber, unlike in a landfill site (Bassis, 1998). Digestion takes place in an oxygen-free environment. Bacteria thrive in this environment by using the oxygen that is chemically combined within the waste (Davies & Cornwell, 1998). They decompose waste by breaking down the molecules to form gaseous by-products (methane) and small quantities of solid residue. Anaerobic sewage plants produce significant quantities of methane, which can be burnt to generate electricity (Davies & Cornwell, 1998). Liquid and solid organic fertilizers are also formed, and can be sold to cover operating costs. For several years, sewage sludge and agricultural waste has been treated by anaerobic digestion, and the process is now being used for municipal solid waste (Bassis, 1998). It requires the biodegradable section of the waste to be separated from other material and put into digestion chambers. Many countries already utilize anaerobic digestion to dispose of large amounts of waste. Denmark for example, treats 1.1 million tonnes of waste by anaerobic digestion every year (Bassis, 1998).

As well as recycling waste, individuals can adopt more sustainable ways of disposing it (Bassis, 1998). One way is to compost any organic waste such as food and garden waste. Organic waste breaks down over a few weeks into mulch which can be used as a soil fertilizer. Individual households have practiced small-scale composting for many years (Baum & Parker, 1974). Large-scale composting schemes are also being developed with the collection of organic waste from parks and civic amenity sites in developed countries.

2.9.1 Knowledge and behaviour of people

To effectively achieve sustainable behaviour change it is necessary to understand how the Ghanaian public values, perceives, and behaves in relation to environmental change. It is for this reason that a KAP (knowledge, attitudes, and practices) approach is particularly useful for this research. KAP research approaches are used to understand what people know, believe and do in relation to a specific topic (WHO, 2008). In health research, this is particularly valuable as understanding the knowledge, attitudes, and practices of a community can provide data on how to improve quality and accessibility of services, current health and cultural practices (like seeking medical attention, exercising, keeping the environment clean among others), and opinions of a particular health outcome (WHO, 2008).

Understanding these issues is particularly important when making policy decisions that will be sustainable, appropriate, and accessible to the community. For example, Jaffer et al.'s (2006) research on the knowledge, attitudes and practices of students' perceptions of reproductive health in Oman demonstrated that understanding what is culturally appropriate in a community is necessary in order to understand behaviour and identify vulnerable individuals. This knowledge will help the researcher target a population (Jaffer et al., 2006), and understand what is culturally appropriate among institution so as to facilitate the implementation of an innovation to solve the problem of school sanitation. KAP studies have been useful in health research in the past. They have spanned a number of health issues, such as public perceptions. Research using this approach has helped gain a deeper understanding of key health issues in both the developed and developing world. KAP studies can also target various populations, including the lay population (Al-Owaish, et al.,1995) KAP research as related to environmental change is valuable in both developing (Yap et al., 2010) and developed

countries examines the environmental perceptions of aspiring teachers in Malaysia. Sustainable waste management and development is being integrated into the Malaysian education system, and teachers' behaviours and attitudes will impact the success of new teaching initiatives. Esa (2010) found that overall the teachers had sufficient knowledge about the environment and the depletion of natural resources as well as positive attitudes toward the concept of knowledge and associated relationship with human behaviour has been a topic of interest among researchers for years. This has arisen as a result of the increasing need for cleaner and improved environment. Thus there is a constant search for a solution to sanitation and health problems. The global anxiety about high rate of waste generation has put waste prevention as a high priority on the waste management hierarchy.

Medina (2002) argues that reducing the amount of waste generated, can have practical advantages such as few collection trucks, University of Ghana <http://ugspace.ug.edu.gh> 36 personnel and waste handling facilities as well as longer life for the landfill sites if individuals have the right knowledge level about proper sanitation. Further Medina (2002) posits that this relevant knowledge will lead to a drastic decrease in related environmental problems that confront developing countries including Ghana. However, waste reduction seems to be very difficult to achieve because it is much associated with changing people's knowledge level and attitude (Mosse 2001). According to Mosse (2001: 4) "local knowledge reflects local power" and it is important in contributing to maintain the legitimacy of decisions. It could be argued that local municipalities would not be able to function properly as community leaders if they do not gain the needed support from the broad masses of the people (Oduro-Mensah, 2012). In many parts of the world, communities continue to be looked at as passive recipients of government services, and are very often disregarded

even in local decision-making process. Ultimately, this approach results in the people failing to know the role they can play in the process (Tadesse, 2006). This goes to lend support to the argument the researcher is advancing to include directly market users in the fight against poor sanitation in order to reduce plastic waste in the market centres and improve sanitation. Pierre (2000) and Fekade (2000) have concluded that the prevailing waste management strategies have failed to take notice of the local knowledge. According to Lyse (2003) this has helped in compounding the waste management and scheme formulation problems instead of contributing to the solution of waste problems in Africa, especially Ghana. This was supported by Duan and Fortner (2005) who observed that people possessed high environmental awareness and knowledge of local environmental issues than global environmental issues.

2.10 How attitude can affect Behaviour of People

In psychology, attitude is a mental position with regard to a state or fact (Johnson, 2000). Attitudes reflect a tendency to classify objects and events and to react to them with some consistency (Lahey, 2003). Attitudes are not directly observable but rather are inferred from the objective, evaluative responses a person makes (Encyclopaedia Britannica, 2011). Attitudes are formed as a result of this ongoing evaluative process. Based on this that attitudes are defined as evaluations of entities, including behaviour, that results in perceptions of favour or disfavour (Eagly & Chaiken, 1993).

Attitudes also refer to a person's general feelings about an issue, object, or person (Petty & Cacioppo, 1981). There has been a lot of literature on recycling of solid waste in developing and developed economies by researchers and institutions such as Momoh and Oladebeye (2010). These studies have shown that attitude influences behaviour of people in taking decision on issues. Kaliyapermal (2004) studied the

knowledge, attitudes and practices of a community and found that changes in attitudes and practices tell what people know about certain things, how they feel and also how they behave. Attitude refers to the feelings towards the subject as well as any preconceived ideas that they may have towards it. According to Aiken (2002), practices refer to the ways in which people demonstrate their knowledge and attitude through their actions. Understanding the levels of attitude and practice will enable more efficient process of awareness creation as it will allow research findings to be tailored more appropriately to the needs of the community as in this study at the Offinso College of Education.

Attitudes are said to have a major impact on behaviour and one's ability to manage and adapt to change while also influencing the behaviour of others (Aiken, 2002). People can change their mind towards a higher plane or a lower plane according to their attitude towards a given situation, person or place or a concept (Aiken, 2002). Attitude is linked to our sense of belief and previous judgments. Attitude counts a lot in our individual and social life. We may say that our attitudes and inclinations are borne out of our experience or encounters with various aspects of life. Thus, Subramanian (2009) holds the view that our attitudes cannot be changed so long as our experiences remain so. Ever since the beginning of attitude research, investigators have puzzled over the relation between attitudes and behaviour. For instance reasons that made people sometimes said they liked something and then acted as if they did not, such as the case where the media awareness creation about poor sanitation which the general public acknowledge, but do not practice proper sanitation in their surroundings. They wondered if these instances were much less frequent than instances where the attitude and behaviour matched perfectly (Campbell, 1963).

The consistent failure to find strong attitude and behaviour correlations led researchers to search for explanations. Fishbein and Ajzen (1975) pointed out that past researches often failed to measure a behaviour that directly corresponded to the attitude being measured. For instance, suppose we measured the relation between attitudes towards protecting the environment and using a recycling facility in a particular week. Even as a strong environmentalist, there might be many reasons why they might fail to recycle in a particular week. For instance, lack of a nearby facility, lack of time to sort recyclables, and so on. The problem was that the measured behaviour of recycling in a particular week was very specific, whereas the attitude object, protecting the environment, much more general. To better measure 'general' behaviour, Fishbein and Ajzen (1975) proposed the multiple act criteria, which involved measuring a large number of behaviours that were relevant to the general attitude being studied. For instance, to measure sorting and selling of waste, we could measure numerous pro-environmental behaviours, as recycling across several weeks, willingness to sort and sell waste as well as the tendency to pick up litter. This would give a more precise and reliable measured behaviour.

Weigel and Newman (1976) gave a more precise and reliable measure to behaviour and found much stronger attitude and behaviour relations by taking an average measure of all of the behaviours (i.e. sorting, selling and recycling of waste), rather than any single behaviour (Weigel & Newman, 1976). To help improve the health of poor people across the world depended on adequate understanding of the socio-cultural and economic aspects of the context in which public health programmes were implemented (WHO, 2010).

Such information had typically been gathered through various types of cross-sectional surveys, the most popular and widely used is the Knowledge, Attitude, and Practice (KAP) (HausmannMuela et al., 2003, Nichter,, 2008). Besides, attitudes were interlinked with the person's knowledge, beliefs, emotions and values, and they were either positive or negative. Causal attitudes or erroneous attitudes were considered derivatives of beliefs and/or knowledge (Pelto & Pelto, 1997). Investigators depended heavily on behavioural indicators namely, what people say, how they responded to questionnaire or such physiological signs. Attitude research was employed by social psychologists; advertising professionals, and political scientists, among others. Public opinion researchers often attempted to distinguish attitudes from related concepts such as values, opinions, and knowledge (Encyclopaedia Britannica, 1994).

Attitude was later developed on the ABC model (Affect, Behaviour Change and Cognition). The affective response was a physiological response that expressed an individual's preference for an entity (Lahey, 2003). The behavioural intention was a verbal indication of the intention of an individual (Lahey, 2003). The cognitive response was a cognitive evaluation of the entity to form an attitude (Myers & Patz, 2009). Good enough evidence suggested that attitudes had important influence on the adoption of health-related behaviours. However, the relationship between attitudes and behaviour could be complex, and to understand how attitudes influenced behaviour may be enhanced by the use of a theoretical framework. The theory of Diffusion of Innovation (DoI) (Rogers, 2003) and Health Belief Model (HBM)

Stretcher et al. (1998) were based on the premise that attitudes influence behaviour in unison with two other factors; sanitation, health and hygiene. Studies of various health behaviours have found that attitudes, knowledge, and practices have a strong

relationship. Each contributed, in varying combinations of importance, to predicting behaviour and behavioural intent (Eagly & Chaiken, 1993). DoI with regards to the study refers to how market users in Dome will adopt and practice the sorting, selling or recycling plastic waste, whereas (HBM) is the assumption that if market users believe that they are at risk of contracting sanitation related diseases fatal to them, they are more likely to practice proper waste management. It would be appropriate, therefore, to consider attitudes toward behaviour as one of these three broad classes of psychological determinants of health-related behaviour (Drucker, 1997). One common problem faced in studying attitudes was the fact that attitudes might either influence behaviours or be influenced by behaviours (Eagly & Chaiken, 1993).

2.11 General knowledge, Attitude and Practices of people towards Sanitation

It is agreed that, source separation and resource recovery is an important method in waste management (Fobil, 2001). This is because there is nothing like waste on this earth. Wastes that are discharged may be of significant value in another setting, but they are of little or no value to the owner who wants to dispose of it. According to Tsiboe and Marbel (2004) Austria, the Netherlands, and Denmark developed a waste management processes to efficiently solve the waste disposal problem by essentially coaxing their citizens to separate their domestic solid waste into glass, paper, plastic categories; thereby enabling easy collection and consequent reuse. As suggested by the three authors, one way of effectively managing solid waste is to minimise solid waste generation through source reduction. Support for behaviour change reduces when it becomes more difficult or costly (O'Connor, Bord, Yarnal, & Wiefek, (2002). Actions that threaten lifestyle or take up personal time (like spending more time to do sorting of waste could have economic costs on market users and would not be widely supported (Fortner, et al., 2000; O'Connor *et al.*, 2002). Behaviour change strategies

that are consistent with the public's awareness and understanding of improved environmental sanitation are therefore necessary in order for sustainable policy to be developed Plotnikoff, Wright, & Karunamuni, (2004). People defecate in public if they have poor access to sanitation that would enable them to eliminate their human excrement.

According to the latest report on the United Nations Millennium Development Goals, eighteen percent of the world population defecates in the open. This was about 1.2 billion people out of the already 2.5 billion people in the developing countries without access to basic sanitation (UN MDG, 2009). Possible causes of increase in flood severity in Accra ranged from inadequate flood management practices to poor waste management. Urban floods occurred when drainage system, gutters and other storm control devices spilt to its plains and over flow to flood control devices during heavy rains. Drains, as well as rivers and streams near the urban centers were often choked with refuse or silted up. This resulted in reduced capacity of river and stream channels causing flooding (Sam, 2009). Environmental pollution could be ascribed to the uncontrolled disposal of both industrial and domestic waste which created problems in the collection and disposal of human waste in the metropolis (Domfeh, 1996). The spread of diseases through food was common problem which resulted in appreciable morbidity and occasional mortality. Traders played important roles in ensuring food safety throughout the chain of production, processing, storage and preparation (Abanobi, Dozie, Ukaga *et al.*, 2009). It is the realization of this indispensable role played by students, in relation to sanitation that the researcher deems it appropriate to conduct the study at the Offinso College of Education. This was informed by the large number of the population that uses this institution and its associated sanitation and health implications for society.

2.12 Challenges towards improving Sanitation Conditions

The greatest challenge of improving sanitation lied in the urban areas and informal sector (Dougall & McGahey, 2003). A study performed with stakeholders on sanitation to understand perception of sanitation challenges suggested that stakeholders' perspective was one of the greatest challenges towards the attitude of residents. In their opinion, there was the need to make education and awareness raising paramount, regarding the connection between sanitation, behaviour and health as pertinent actions. Capacity buildings, human resources, competitive involvement of the private sector were also raised. Nostrum was also mentioned as challenging areas that the assembly needed to develop further (Owusu & Roojen, 2008). It is agreed that, source separation and resource recovery is an important method in waste management. This is because there is nothing like waste on this earth. Wastes that are discharged may be of significant value in another setting, but they are of little or no value to the producer who wants to dispose of it.

According to Tsiboe and Marbel (2004), Austria, the Netherlands, and Denmark developed a waste management processes to efficiently resolve the waste disposal problem by essentially coaxing their citizens to separate their domestic solid waste into glass, paper, plastic categories; thereby enabling easy collection and consequently reuse. As suggested by the three authors, one way of effectively managing solid waste is to minimise solid waste generation through source reduction. Another problem of improving sanitation was that people refused to talk about sanitation as responsibility for all. So what was seen as solely the responsibility of others when it was for all could not be improved upon unless that attitude was altered or changed. Until discussed and personalized we cannot improve it (National Environmental Sanitation Policy Coordination Council NESPoCC, 2008). The open dumping areas could create

health problem, as it led to multiplication of rodents and flies. Open dumping might result in the generation of anaerobic gases, which led to creation of bad odour primarily resulting in a variety of diseases. There were persistent complaints from people residing near open dumping areas. Health care establishment premises with poor solid waste management were prone to spreading diseases (ENVIS Centre, 2010).

The World Toilet Organisations (WTO) started the World Toilet Summit, an annual international conference for all people in the toilet and sanitation field to meet in 2008. The purpose was to exchange knowledge and experiences. It was held in 2001 at Singapore, 2002 in Seoul, 2003 in Taipei, 2004 Beijing, 2005 Belfast, 2006 Moscow, and 2007 New Delhi. Every event was sponsored by the respective local governments as WTO gave them the hosting rights. People were so inhibited against the subject “sanitation”. Second was inability to develop and use skills in managing waste into useful materials. There was no such thing as human waste. Our excreta are actually nutrients and good fertilizers. The third challenge was government’s inability to provide enough funds for managing waste. The WTO drove a market-based strategy as donors funding were not the long term solution. Inadequate public education was another challenge and need for proper sanitation and how waste could be managed. The filthy condition was a result of ignorance and non-enforcement of the law.

Apparently, the laws that govern sanctions on living and working in unsanitary condition were either unknown or not enforced (NESPoCC, 2008). Solid waste, these rivers that acted as open sewers, posed serious threats to public health in the densely built areas of the urban cities (Sam, 2009). In developing countries such as Ghana,

there were many communities, which were unplanned and were occupied by squatters and illegal settlement. Growth of grass and weeds were common sights in many sections of various river channels. This naturally resulted in retardation of flow and consequent flooding of the banks of the rivers during heavy storm. During dry weather the grass and weeds caused ponding in several sections, which provided breeding grounds for mosquitoes. Accra had many fast-growing, low-income communities with no infrastructure for waste disposal. Waste washed into drainage ways and was hypothesized to cause increase flooding (Sam, 2009). Eight main drains frequently affected over thousand people within the Accra metropolitan area. This was common in neighbourhoods such as Dome, Mateheko, Sukura, Nima, Tesano, Mukose, University of Ghana <http://ugspace.ug.edu.gh> 56 Mpamprom Stream and Dzorwulu. The relative impact was human suffering, diseases epidemic, poor sanitation health, stress, and disruption of commercial activities and normal activities. Clearly, the existing system could not cope with the ever-increasing volume of solid waste being generated in Ghana.

Therefore, the public disposed of rubbish indiscriminately especially in watercourses and drainage channels and often through burning. Huge piles of refuse as overflowing refuse containers are seen throughout the urban centres particularly near markets and squatter settlements (Ghana Meteorological Service GMS, 1995) Forty percent of the world population, 2.5 billion people, had no access to basic sanitation. This post looked at some of the challenges and opportunities that laid them. The vast majority of those without access resided in Asia and sub-Sahara Africa where the regional access rates fell to as low as fifty three percent and thirty one percent respectively (Earth Trends, 2006). Flooding in Accra had become a perennial phenomenon. Experts had been grappling with ways and means of containing the floods in order to

save lives and property. Over the past decade beginning in 1995, floods had claimed several lives, and destroyed public infrastructure and property.

Inadequate capacities of some critical culverts, insufficient stream channel capacity and obstruction of flows by buildings across natural stream courses and deposition of garbage into the stream also gave rise to flooding. In Accra as most urban centres in Ghana, provision of infrastructural facilities had substantially lagged behind the rapid rate of housing development. Inadequate storm water drainage was one of the most serious problems facing Accra (GMS, 1995). Flooding in low-lying areas, erosion of steep slope areas, and pollution of streams by waste discharges, was identified as the major environmental problems facing the city. These problems were interrelated in that, flooding was caused by insufficient carrying capacities of the respective streams, brought about by the accumulation of silt resulting in erosion blockages caused by solid waste deposited in the streams (Ghana Meteorological Department, 1995). One of the principal flooding types in Greater Accra Metropolitan Assembly was due to the rate and dynamics of urbanization. Floods in this regard could be attributed to the increase of the impermeable areas and inadequate drainage systems such as conduits and channels (White and Hass, 1975). The land use surface in small urban pocket within Accra Metropolitan Assembly was made of aluminum roofs, untarred streets and other impervious surfaces. Runoff flowed through these surfaces to the storm sewers and low lying areas. It changed the hydrologic cycle, increase the over land flow and decrease the groundwater flow (White & Hass, 1975).

Under these circumstances the peak discharge increases together with the flood frequency. In addition, the wash urban surfaces during rainy days increase the pollution load in urban environment and to downstream rivers. Urban flooding,

however, was a natural process in which drainage system spilt to their plains during storms (Gucci et al., 1999). In Ghana the causes of urban flooding although diverse, were to some extents interrelated. In Accra, low lying areas were subjected to severe perennial flooding, which was generally attributed to inadequately sized culverts and blockage of the major drains by cumulated silt caused by years of neglect and lack of maintenance (Nyamekye, 2002). There was also the effect of tidal variations on rivers and streams leading to flooding. The effects of variations of the hydro climate conditions led to flooding (Wohl, 2002). This could be attributed to the variation and the spatial context of regional, local, and global atmospheric processes and circulation patterns from which the floods developed (Hirschboeck, 1988).

The capacities of most rivers have been greatly reduced by the deposition of silt and garbage and growth in and along the riverbanks (Lavallin, 1996). While existing solid waste disposal facilities were inadequate to deal with the quality and quantity of waste generated, sophisticated systems such as incineration and biogas production were not in use as these entail a high level of technology. Besides maintenance requirements were high. Accra Metropolitan Assembly's urban run-off contained varying quantities of all the following, depending on the location where the runoff was generated. Notably among them were floatable and visual contaminants, degradable organics, suspended solids nutrients, bacteria, and virus toxicants and dissolved solids. Floatable and visual contaminants were for the most part as a result of improper solid waste disposal. Plastic bags and bottles were the commonest items to be found in urban runoffs.

2.13 Environmental Degradation and Pollution

Environmental factors play a central role in human development, health, and disease. Broadly defined, "the environment, including infectious agents, is one of three primary factors that affect human health. The other two are genetic factors and personal behaviour" (US Department of Health and Human Services, 2000, p8-24). Overall, it is estimated that 25-33 per cent of the global burden of disease is attributable to environmental factors (WHO, 1997; Smith, Corvalan, & Kjellstrom, 1999). Some estimates suggest that environment-related premature death and illness account for 18% of the total burden of disease in the developing world (Murray & Lopez, 1996). This comprises contributions from water supply and sanitation (7%), indoor air pollution (4%), vector-borne diseases (3%), urban air pollution (2%) and agro-industrial waste (1%). In sub-Saharan Africa the figure is even higher at 26.5 %, mainly related to water supply and sanitation (10%) and vector-borne diseases (9%).

Human health is increasingly determined by environmental conditions (Rapport, Christensen, Karr, & Patil, 1999; McMichael, 2001). Human exposures to hazardous agents in the air, water, soil, and food and to physical hazards in the environment are major contributors to illness, disability, and death worldwide. Deteriorating environmental conditions are a major contributory factor to poor health and poor quality of life. Furthermore, deterioration of environmental conditions in many parts of the world slows sustainable development (US. Department of Health and Human Services, 2000). Mismanagement of natural resources, excessive waste production and associated environmental conditions that affect health pose major challenges to sustainable development. Impoverished populations living in rural and periurban areas are at greatest risk from degraded environmental conditions. According to the United Nations Environmental Program (UNEP), the cumulative effects of inadequate and

hazardous shelter, overcrowding, lack of water supply and sanitation, unsafe food, air and water pollution, and high accident rates, have serious effects on the health of such populations (UNEP, 2002).

Ill health resulting from poor environmental quality varies considerably among countries. For instance communities in many parts of Central and South America, Central Africa. West Africa and Asia are highly vulnerable to water-borne and vector-borne diseases (UNEP, 2002). Air pollution threatens large urban areas and megacities, most of which are in developing countries. People in developed countries are more vulnerable to exposure to toxic chemicals and technological accidents but there are notable exceptions such as arsenic contamination in South Asia (UNEP, 2002). According to UNEP (2002) reports, in Bangladesh, naturally occurring arsenic in underground sediment leaches into the groundwater. More than 25 per cent of the 4 million tube wells that are the main source of drinking water contain dangerous levels of arsenic. Nearly 75 million people are vulnerable to arsenic poisoning which can cause skin cancer, kidney and liver failure, respiratory problems and death. Poor environmental quality has its greatest impact on people whose health status already may be at risk, e.g. malnourished children and people with certain genetic conditions such as sickle cell anaemia.

Globally, 7% of all deaths and diseases are due to inadequate water, sanitation and hygiene (UNDP, UNEP, World Bank & WRI, 1998). Approximately 5% are attributable to air pollution (Holdren & Smith, 2000). Every year, environmental hazards kill 3 million children under the age of five (WHO, 2002). Environmental degradation and pollution is therefore a major issue to be tackled worldwide for the survival of human beings and other living creatures on the planet earth.

When the environment becomes less valuable or damaged, environmental degradation is said to occur (Think Quest Education Foundation, 1999). Environmental degradation according to Quashigah-Sowu (2011) is the deterioration of the environment through the depletion of resources such as air, water, and soil, the destruction of the ecosystems and the extinction of wildlife. In view of this, pollution is a form human processes. The largest areas of concern at present are the loss of rain of environmental degradation. Environmental degradation can occur naturally, or through forests, air pollution and smog, ozone depletion, and the destruction of the marine environment (Think Quest Education Foundation, 1999).

Microbiological contamination of the sea by sewage pollution has precipitated a health crisis of massive proportions globally according to UNEP (2002). A changing environment will affect people in different parts of the world in unique ways. For instance, bathing in polluted seas is estimated by UNEP (2002) to cause some 250 million cases of gastroenteritis and upper respiratory disease every year, with an estimated annual cost worldwide of about US\$1.6 billion. Some of these people according to the report will be disabled over the longer-term, suggesting that the global impacts of marine pollution are comparable to those of diphtheria and leprosy (GESAMP, 2001). Again, eating sewage-contaminated shellfish causes an estimated 2.5 million cases of infectious hepatitis a year, of whom some 25 000 die and another 25 000 suffer long term disability resulting from liver damage (GESAMP, 2001).

Another major concern of a changing environment is climate change. The effects of climate change can be seen all over the world and temperatures including those of coastal waters have risen. According to WHO Director General, Dr. Margaret Chan's

(April 7, 2008) statement on climate change, WHO identified five major health consequences of climate change. These were:

1. Compromised food security due to rising temperatures and more frequent droughts and floods,
2. More potential deaths and injuries caused by storms and floods due to frequent extreme weather events. In addition, flooding can be followed by outbreaks of diseases, such as cholera, especially when water and sanitation services are damaged or destroyed,
3. Scarcities of water, which is essential for hygiene, and excess water due to more frequent and torrential rainfall will increase the burden of diarrhoeal disease, which is spread through contaminated food and water,
4. Heat waves, especially in urban "heat islands", can directly increase morbidity and mortality, mainly in elderly people with cardiovascular or respiratory disease. Apart from heat waves, higher temperatures can increase ground-level ozone and hasten the onset of the pollen season, contributing to asthma attacks and
5. Changing temperatures and patterns of rainfall are expected to alter the geographical distribution of insect vectors that spread infectious diseases. Of these diseases, malaria and dengue fever are of greatest public health concern (Chan, 2008). A changing environment will also result in pollutions of all forms and lead to an ecological imbalance.

According to a website report (Tropical Rainforest Animals Corporation, 2008), environmental pollution is the contamination of the physical and biological components of the earth/atmosphere system to such an extent that normal environmental processes are adversely affected. Although pollution had been known

to exist for a very long time (at least since people started using fire thousands of years ago), it had seen the growth of truly global proportions only since the onset of the industrial revolution during the 19th century (Tropical Rainforest Animals Corporation, 2008). Environmental pollution is a problem both in developed and developing countries. Factors such as population growth and urbanization invariably place greater demands on the planet and stretch the use of natural resources to the maximum.

It has been argued that the carrying capacity of Earth is significantly smaller than the demands placed on it by large numbers of human populations (Tropical Rainforest Animals Corporation, 2008). And overuse of natural resources often results in nature's degradation. In this vast universe, the earth is so far, the only planet to be endowed with an environment that can support life-forms that we are familiar with.

Human beings as the most intelligent species have constantly made use of their inventive genius. Human beings have made a more spectacular breakthrough in technology in the firm belief that it will bring relief. Little thought was given to the fact that could lead to an ecological imbalance that may lead to dangerous pollution in life-supporting systems in the environment.

This study used descriptive-survey design to assess the influence of environmental education on some sanitation practices, perception and attitude towards the environment of pupils/students in some selected schools in the New Juaben Municipality of the Eastern Region of Ghana. The study sought to assess the influence of environmental education on students' perception and attitude towards the environment. Again, the study sought to establish the link between students' knowledge about environmental issues to their actual environmental practices,

especially how they dispose of waste in the school and wherever they find themselves in addition to practices such as hand washing being a regular, practice, picking litter in school and educating others on the need to keep the, surroundings clean.

Specifically, the study sought to address the following Research Questions:

1. What perceptions do students of the New Juaben Municipality have of their environment?
2. What are the differences between the attitudes of SHS & JFIS students towards the environment?
3. What is the sanitation situation in the school and what kind of sanitation practices are mainly used by pupils/students in the area of the study?
4. Does good sanitation imply a higher level of knowledge in science (hygiene education or integrated science or environmental science)?

A sample of 150 pupils/students was selected from ten schools using proportionate stratified random sampling method. These were made up of 67 Primary school pupils forming 44.7% of the sample, 33 JHS students making 22% of the sample and 50 SHS students making 33.3% of the sample. The sample was also made up of nine Basic schools (Primary & JHS) and one Senior High school. Three instruments were used in the study; questionnaires, interview guide and an observation schedule. Data collected was analysed using descriptive (Frequency counts, percentages, graphs, mean, standard deviations, correlation and t-test) and inferential statistics; ANOVA.

Non stratified random sampling was used to select 150 respondents comprising 30 students each of the 5 departments within the college. These departments were Science, Mathematics, Languages, Social sciences and Home economics.

2.14 Sanitation and Development of Decision making Models, & (Theoretical Framework)

Sanitation promotion has led to the development of decision making models, theoretical models (and explanatory frameworks Dreibelbis, Winch, and Leontsini, E., Hulland, K. R. S., Ram, K. P., Unicomb, L. & Luby, S. P. (2010). Mainly because the success of any intervention depend enormously on a combination of structural, behavioural, individual as well as community components Parker *et al* (2012). One of such models is the Integrated Behavioural Model for Water, Sanitation and Hygiene (IBM-WASH) which “facilitates the process of developing interventions that operate beyond the individual and household levels; interventions that operate at the structural level with the capacity to reach largest sections of the population, but are also highly cost effective” (Sweat *et al.*, 2006).

IBM-WASH was developed from a study of already existing models and frameworks for behavioural change and the maintenance of such changes (Parker *et al.*, 2012). It was found that most of the existing models were targeted at individuals and sought to understand the behavioural factors without much consideration for larger structures within which the individual finds himself as indicated in earlier works by McLeroy, Bibeau, Stecker and Glanz (1988). There were also indications that, there have been either weak or virtually lack of measurement instruments to rigorously measure and monitor the programs at all levels (Sweat *et al.*, 2006). Developed from a pilot study in Bangladesh by the International Centre for Diarrheal Disease Research (ICDDR), the IBM-WASH has three dimensions consisting of contextual, psychosocial and technological dimensions which are all interactive in nature (Dreibelbis *et al.*, 2006). The contextual dimension concerns the individual and his environment or setting that influences change in behaviour that might eventually lead to the adoption of new

technologies; the psychosocial which combines behavioural, social and psychological attributes in influencing desirable behavioural outcomes and new technologies; and technological dimensions that consider the appropriateness of new technologies that have influenced their adoption (Janz & Becker, 1984; Bandura, 1989; Wood, Foster & Kols, 2012).

The model also suggested five levels of application, including societal or structural level which deals with policy and regulation, leadership, finance and distribution. Level two is the community which deals with issues concerning availability of and access to resources in the physical environment, shared values, social integration and maintenance of products (McLeroy *et al.*, 1988). Level three is the interpersonal/household level which espouses roles and responsibilities, sharing of access and norms while level four which is the individual, is related to issues such as education and age, status, gender, perceives threats and cost of products (Jenkins & Scott, 2007). Level five is habitual. It considers the favourability of the environment for habits to be formed and how easily and effectively the generated products can be used (Wood, Foster, & Kols, 2012). Another approach worth noting is the “Rights Approach” in Sanitation for All (SANALL) by UNICEF (2000) which sees sanitation as promoting human rights and dignity, thereby describing lack of sanitation as “a public health disaster” (UNICEF (SANALL), 2000, p. 1). This is needed for children, girls and women who sometimes had to wait till it is dark to free their bowels in communities without such facilities, the sick and elderly, and the society as a whole. The discomforts brought to these people may also come along with serious illnesses (Mara, 2008). SANALL believes that heightened personal dignity and national pride are two of the many benefits of good sanitation (Songco, 2002).

SANALL also works and championing following, political will and strong government role, promoting behaviour change, reaching school children, giving families a choice, community planning and management and cost sharing,” and what doesn’t - “giving sanitation low priority, narrow focus on technology, ignoring the family as a whole, a „one-system fits all“ approach, a top-down approach, and limited access to funds and credit” (UNICEF, 2000, p. 10-11; Mara, 2008). For policy makers, SANALL suggests eight steps. Step one suggests making sanitation a priority by formulating policies that bring together the works of various agencies as well as empowering the local authorities to develop plans that will work for them best (Songco, 2002). Step two promotes building alliances with civil society groups, the media and private sector to promote the demand for sanitation services at the grassroots (Tayler, Parkinson & Colin, 2003). Step three is developing plans and strategies that will ensure community involvement while step four is to encourage and promote basic hygienic ways of preventing disease transmission (UNICEF, 2000).

Step five is to pay close attention to the needs of girls, women and children while step six is to prioritize sanitation programmes in schools in order to promote desirable life-long behavior change as well as a hygienic living environment (Mara, 2008). Step seven is to provide quick alternative access to sanitation during disasters and crises while step eight encourages gathering of information and information sharing on the challenges and successes which can be encouraged through effective monitoring and research (Tayler, Parkinson and Colin, 2003). In dealing with public sanitation needs in order to prevent diarrheal diseases therefore, there must be preventing measures in place (Chin, 2000). There is the need for “a more flexible approach to policy infrastructure, technical infrastructure and cost recovery in urban sanitation interventions” (McFarlane, 2008).

Also, WHO (2015) Factsheets 3.14 clearly describes sanitation in public places such as those concerning long-distance bus and railway stations, ships and ports, cordon sanitaries, markets and schools (WHO Factsheets, 2015 p. 93-97). With the world struggling to keep pace with sanitation efforts, the need for developing methods that work best for specific need is also increasing (McConville, 2008).

Clearly, dealing with sanitation in public places must be holistic and participatory in order to promote sustainability. This has also led to several approaches that may be considered in planning water and sanitation programmes. These approaches have been used as frameworks by several agencies in the sanitation promotion processes. They include the Strategic Choice Approach (Friend, 1992); Open Planning of Sanitation Systems (Ridderstolpe, 2000); Logical Framework Approach (LFA) (Ortegren, 2004) and Sanitation 21 (IWA, 2006). These frameworks are mostly geared towards planning and show basically steps that must be followed in strategic planning towards sanitation improvement projects. The first of the recommended steps is problem identification to determine the current or prevailing situations and therefore, employs the use of some strategic tools such as PEST and SWOT analysis (Ortegren, 2004). The next step involves the defining of objectives and the expected outcomes that are desired (IWA, 2006). Next, to determine how to achieve the objectives, and so, a series of options must be considered as well as the available technologies that can possibly be sustained. From the available options comes the next step of process selection that must eventually lead to the action plan of the project (Ortegren, 2004).

This is closely followed by monitoring and evaluation to guide to success as well as help correct the shortfalls in the action plan (IWA, 2006). One of the most comprehensive frameworks for fighting diarrhoea diseases which are a result of bad

sanitation is the Hygiene Improvement Framework (The WB EHP and partners, 2004). The framework has three main dimensions or components. The first is improving access to water and sanitation hardware. Its indicators include a water supply system, improved sanitation and household technologies. Water supply looks at the issues of provision of water in terms of quality and quantity to help reduce the risk of contamination of food (Howard & Bartram, 2003).

Improved sanitation is the second indicator. It involves the provision of facilities to dispose of human excreta in ways that safeguard the environment and public health. Some disposal techniques include the use of various kinds of latrines, septic tanks, and water-borne toilets. The third indicator, household technologies concerns the ability of individual homes and facilities to provide those items needed in promoting healthy practices such as soap or local substitutes for hand washing, chlorine, filters, hygienic and efficient water storage containers, potties for young children among others (The WBEHP and partners, 2004; p 11). The second component is hygiene promotion. Its first indicator is communication aimed at raising awareness about hygiene facilities as well as practices. It also helps to share information among the targeted group towards the promotion of behaviour change. The traditional media, music, song and dance, community drama, literacy materials, leaflets, posters, pamphlets, videos, and home visits are examples of communication channels (Nunoo, Osman & Nanedo, 2009).

Typical venues include community gatherings, health centres, schools, day-care and nutrition centres, and the household (Pinfold, 1999). This makes it important to train health workers, teachers, and community agents in hygiene promotion skills. The second indicator is social mobilization. It is a process of obtaining and maintaining

the involvement of various groups and sectors of the community in the control of disease (Nandha & Krishnamoorthy, 2007). This may involve encouraging a community group to design and implement a campaign such as increasing the use of soap for hand washing or to promote the proper use and maintenance of sanitation facilities. Others include social marketing which employs marketing principles such as partnerships with producers of hygiene promotion items to contribute to hygiene promotion; community participation which involves the community (ethnic, religious groups, women, children etc.) in the design, implementation and monitoring of strategies aimed at behaviour change; and advocacy which seeks to encourage people such as donors, program managers, and community representatives to advocate for improved hygiene behaviours and for interventions that support these behaviours to governmental and nongovernmental stakeholders (The WBEHP and partners, 2004; p.12-13).

The third component is strengthening the enabling environment. This may take place at the community, municipal, regional, or national levels and may take the forms of policy improvement, institutional strengthening, community organizations and financing partnerships (Dreibelbis, Winch & Leontsini, 2013). Policy improvement assesses the adequacy of national policies, identifies gaps and recommends and builds consensus on developing more effective policies. Institutional strengthening is aimed at helping institutions to clearly define their roles and responsibilities as well as improve their capacity in leadership, systems and procedures, technical competence, and training their staff so they can work effectively (Cairncross, 2010). Next is promoting community involvement. This involves getting the community people to become committed to maintaining the systems put in place. It is believed that when community members have done the “work” and when they have committed their own

time, effort, and resources to establishing improved water and sanitation systems, they are more committed to following up on and safeguarding their investments. Financing and cost recovery addresses the issue of cost. This is to promote financial viability in order to secure financing for projects (Bartram *et al.*, 2005).

Cross-sector and public-private partnerships involve bringing together several entities, both public and private who would work together using their core competencies through interagency committees, steering committees, and task forces among others (The WBEHP and partners, 2004, p. 15-16). Originally, this framework was developed to promote ways of developing better programmes of preventing childhood diarrhea or diarrhoea diseases - one of the top three killer diseases in developing countries - and thus a reduction in child mortality (Sanitation and Hygiene Promotion Programming Guidance, 2005). With about 4 billion episodes of diarrhoea-related diseases annually, mainly attributed to three major environmental causes including poor hygiene, poor sanitation and contaminated food and water, an approach is needed to successfully respond to all three conditions comprehensively (Bartram *et al.*, 2005). The framework identifies pathways to contamination as well as blocking those pathways with specific strategies. These strategies in the framework seek to help strengthen each country's learning process, their programming and their ability to develop policies, rather than to simply provide these countries direct services (The WBEHP and partners, 2004, p. 5). The framework is therefore a comprehensive approach to preventing diarrhoea in terms of access to the necessary hardware or technologies, promoting healthy behaviors, and support for long-term sustainability.

Fig. 1: The Hygiene Improvement Framework Source: EHP and Partners (2004, p. 9).

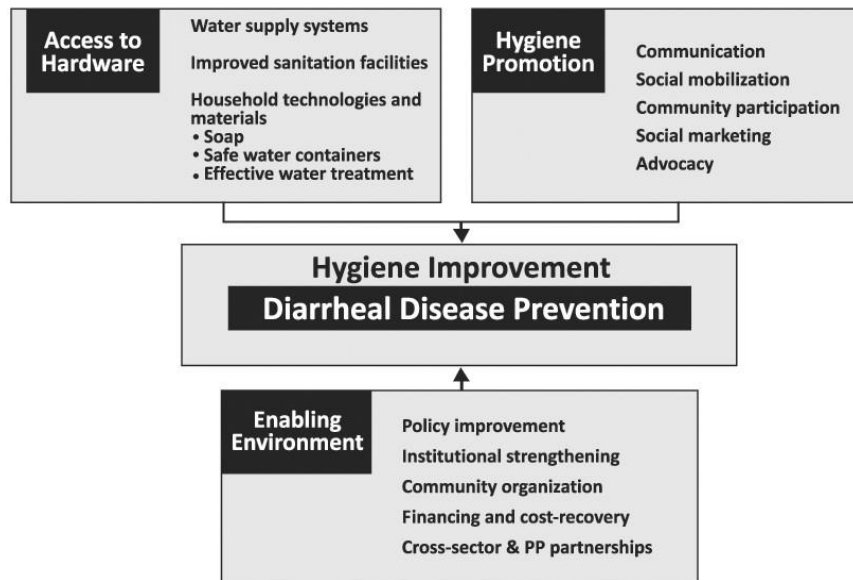


Figure 1: The Hygiene Improvement Framework (EHP and Partners, 2004, p. 9)

The framework is therefore a comprehensive approach to preventing diarrhoea in terms of access to the necessary hardware or technologies, promoting healthy behaviours, and support for long-term sustainability. However, this study considers promoting sanitation not only as a means of disease prevention but sees the availability of good sanitation infrastructure and practices as dignifying as well. “The lack of access to sanitation and the means of good hygiene is an assault against human dignity” (Tratschin, 2011). Once an organization takes it upon itself to manage a facility where people gather consistently, there is the need to make sure that the people are provided with a conducive environment for teaching and learning. There must therefore be a framework purposely for promoting sanitation in public places such as schools and markets. The researcher therefore modified the hygiene improvement framework to be used for the study. This is known as the Sanitation Promotion Framework to be used in promoting urban sanitation in public places such as schools and markets. (Fig 2).

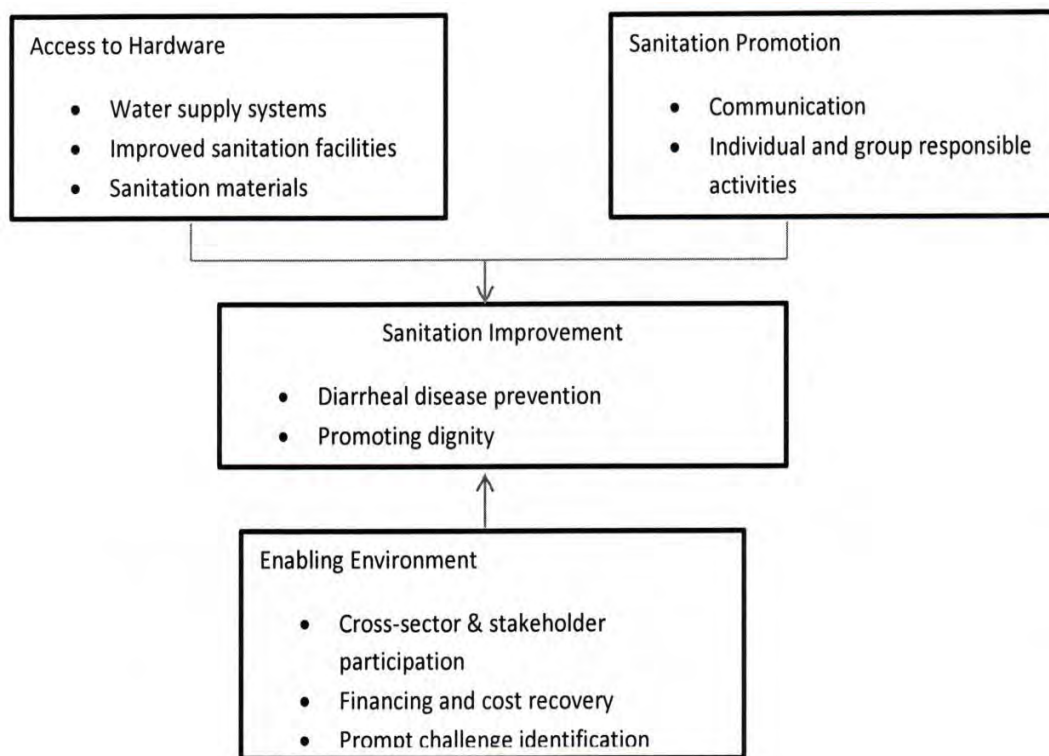


Figure 2: The Sanitation Promotion Framework

This framework shares in some components of the Hygiene Improvement Framework. This one is purposely suggested to study sanitation in a public place such as the schools. The additions include Individual and group responsible activities and prompt challenge identification combined with others to promote not only sanitation but human dignity as well. Individuals and groups are needed to promote sanitation. “Effective sanitation cannot be effectively delivered by outside agencies” (Lopez, Mathers, Ezzati, Jamison & Murray, 2006). Sanitation promotion must not be limited to simply stimulating demand but actual activities as well. Therefore, there is the need for those involved to have specific activities that they must engage in this regard. It is also necessary, among other things, for challenges to be identified and managed so they do not develop into full blown problems.

2.15 Attitudinal Dimensions and Theoretical Framework

The theoretical perspectives that guided the study on environmental education and sanitation were based on the Theory of Planned Behaviour (TPB) and the Theory of Reasoned Action (TRA) proposed by Ajzen and Fishbein (1980). The concept of attitude and associated relationship with human behaviour has been of interest among researchers for years (Ifegbesan, 2010). According to Ifegbesan (2010), many studies of knowledge and attitudes have found a positive and often significant relationship between the two variables. In trying to explain human behaviour, Ajzen and Fishbein formulated the Theory of Reasoned Action in trying to estimate the discrepancy between attitude and voluntary behaviour using expectancy value models. It was later extended to include deliberate behaviour because behaviour may not always be voluntary, hence the Theory of Reasoned Action.

Theory of Reasoned Action suggests that a person's behaviour is determined by his/her intention to perform the behaviour and that this intention is, in turn, a function of his/her attitude toward the behaviour and his/her subjective norm (Ajzen & Fishbein, 1980). The Theory of Planned Behaviour holds that only specific attitudes toward the behaviour in question can be expected to predict that behaviour (Ajzen & Fishbein, 1980). In addition to measuring attitudes toward the behaviour, the Theory of Planned Behaviour holds that only specific attitudes toward the behaviour, there is the need to measure people's subjective norms - their beliefs about how people they care about will view the behaviour in question (Ajzen & Fishbein, 1980). Four basic concepts are distinguished in the theory: beliefs, attitudes, intentions and behaviour. Beliefs involve knowledge or opinions concerning the attitude object; attitudes involve emotions and evaluations with respect to that object; intentions refer to behavioural aims; and behaviour involves the actual action itself. In their view, for

instance, actual behaviour is, first, a function of behavioural intentions, and second, one of attitudes that, in turn, are affected by knowledge. A critical assumption in then theory is that knowledge and attitudes influence actual behaviour only through behavioural intentions (Ajzen & Fishhein. 1980; Hines, Hungerford & Tomera, 1987).

In this regard, pupils'/students' environmental perceptions can be viewed as their beliefs or opinions that are shaped by their environmental knowledge which informs on their environmental attitudes, and in turn should influence their actual sanitation practices or behaviours. Why then, should be people show or do actions/ habits that result in unsanitary surroundings though they may have high knowledge on environmental issues? Ajzen's and Fishbein's Theory of Planned Behaviour and Theory of Reasoned Action may provide an understanding to help educators' understand the learners' attitude. Another theory very similar to afore mentioned theory is one developed by Venatesh and Davies (2000) that could also provide educators' with a further understanding. This is the Theory of Reasoned Action. Planned Behaviour and Technology Acceptance Model on Subjects Norm. This theory argues that "the rationale for a direct effect of subjective norm on intention is that people may choose to perform a behaviour, even if they are not themselves favourable towards the behaviour or its consequences, if they believe one or more important referents think they should, and they are sufficiently motivated to comply with the referents" (Venatesh & Davies, 2000: P 187).

Luthans (1989) defines attitude as "a persistent tendency to feel and behave in a particular way towards some object" (Luthan, 1989: p170). According to Luthans, attitude consists of three components: the emotional, informational, and behavioural. The emotional include the person's feelings about the object/issue, the informational

of the beliefs and information or knowledge the individual has about the issue/object, and behavioural consists of a person's tendencies to behave in a particular way towards the issue/object. To Luthans, attitudes tend to persist unless something is done to change them. Attitudes can fall anywhere along a continuum from favourable to unfavourable (Luthans, 1989). This informed on the environmental attitude rating scale (EARS) used in this study of: good, fair and poor environmental attitudes based on the favourableness' or unfavourableness of one's environmental attitudes.

Attitudes may inform practices of an individual. A practice is an action or behaviour an individual engages in and is normally induced by an attitude either consciously or unconsciously. Practice is therefore a product of knowledge and attitude. This is summarized by Bedworth and Bedworth (1992) as: 1) "There is no options without knowledge, 2) "Knowledge is the basic and essential element of conceptualisation" (or perception, my own since perception results from conceptualisation), 3) Conceptualisation is the heart of attitude formation" and 4) "Attitudes direct behaviour (Practice)" (Bedworth & Bedworth, 1992: p 56).

Based on these, a rating scale was developed for all the variables assessed in the study which are; environmental perception, environmental attitudes, sanitation practices and environmental knowledge level of respondents. For the first three variables, the rating scale was developed based on the assumption that, the variable can fall anywhere on a continuum of favourable to unfavourable, thus good, fair or poor. By studying the binary partition of knowledge (high/low), a three category one was adapted from it giving high, moderate and then low.

Many studies on environmental perception, attitudes and knowledge have helped I, understand people's views and opinion about the environment. For instance, Leftridge and James (1980) studied the perceptions of rural and urban secondary students on environmental issues relevant to environmental education curriculum. The study involved forty-five classes. The findings were that "before embarking (Walston, Warren, Warshay & Wilhelm, 2004).

Ifegbesan on any activities that cognitive in natures. environmental issues that are relevant to students' lives must be surveyed first" and that "concerted efforts must be made to implement environmental awareness activities into all disciplines" (Leftridge & James, 1980: p 7). Other studies (Andrews, 1978: Cortes, 1987: James 1988; Gambro, 1991; Blaikie, 1993; Ramsey, 1993; Benton, 1994; Gambro & Switzky, 1994; Warren & Bingham. 1994) have found the correlation between environmental education, behaviour and attitudes. Some studies (Van Liere, Dunlap, 1981; Kellert 1985; Gambro, 1991; Eagles & Denvare, 1999; Raudsepp, 2001; Diamontopoulos, Schlegelmilch Sinkovics, S: Bohlen 2003) have trial to establish the influence bet Wee') education, and gender on environmental attitudes/perceptions towards environmental issues. Some (Gambro, 1991; Raudsepp, 2001; Diamontopoulos, Schlegelmilch, Sinkovics, & Bohlen, 2003) round gender to be significant; others (Van Liege & Dunlap, 1981:, Kellert, Eagles & Demare, 1999) did not.

There are a number of studies on people environmental practices with regard to waste management (Blaikie, 1993; Mansaray & Ajiboye, 1997; Freduah 2004; Wailing,, 2010; Green, 2011). Blaickie (1993) involves some high school students in Melbourne in a study on Education and Environmentalism Ecological World Views and Environmentally Responsible Behaviour. Mansaray and Ajiboye (1997)

investigated into 'Environmental Education and Nigerian Students' Knowledge, Attitudes and Practices: Implications for Curriculum Development'. The students performed poorly in the knowledge component of the questionnaires and demonstrated negative attitudes towards the issues and indicated practices that were harmful to a healthy environment. Raudsepp (2001) studied socio-demographic variables (age, gender, & education) and environmental perception. Raudsepp (2001) reported that age, gender, and education showed strong and consistent relations with environmentalism. Freduah (2004) studied 'Problems of Solid Waste Management in Nima, Accra'. It was found out that solid waste management by individuals and the district assembly was a serious challenge.

Also, Walling, Walston, Warren, Warshay, and Wilhelm (2004) studied 'Municipal Solid Waste Management in Developing Countries' and noted that it posed a serious problem. Ifegbesan (2010) in a study on exploring secondary school students' understanding and practices of waste management, found out that waste management among students' and the school management was generally poor and that students' practices were generally negative. The study also showed that significant relationships exist between students' background variables (gender, age and class) and awareness, knowledge and practice. Green (2011) investigated into 'solid waste management problems in secondary schools in Ibadan, Nigeria. Again, some waste management practices of students and the school management was found to be environmentally harmful especially the practice of burning waste.

2.16 Conclusion

Literature reviewed in this chapter has helped in bringing out the fact that sanitation is as essential as food and water and plays a major role in health promotion. It is as much an individual business as it is a collective business. The success of promoting sanitation is therefore dependent both on individual attitude and behaviours as well as communal activities and behaviour. Over the years, attention has been paid to poor communities and on the provision of water and improved sanitation and hygiene behaviour. However, one area that is in need of attention is public places and institutions where people gather in large numbers with high demand for sanitation services. This area therefore needs attention from all stakeholders as well as academia. Other relevant issues from the review is the current sanitation situation of schools and the need for improved strategies that must extend beyond the household. Also considered is urban sanitation in general terms which seems to running beyond the pace of promoters despite the numerous sanitation policy documents that are developed by government and other agencies. There cannot be desired improvements without the active participation of relevant stakeholders who must recognize and play their roles as needed. In addition to these is how issues of sanitation should be approached in order to provide as well as some documented sanitation promotion strategies. These led to the development of a new framework purposely for sanitation in schools and markets to prevent diarrheal diseases and promote the dignity of the people as well.

CHAPTER THREE

METHODOLOGY

3.0 Overview

This chapter covers issues on the setting of the study area and the research method employed in the study. In addition, the research design, population, sample and sampling procedures, and data collection instruments have been discussed. Validity of the research instruments, reliability of the research instruments, data collection procedure and how the data was analysed in the study is discussed.

3.2 The Research Paradigm

The research paradigm used for this study was the interpretivism approach. It has two assumptions: relativist ontology and transactional or subjectivist epistemology. “Relativist ontology - assumes that reality as we know it is constructed inter-subjectively through the meanings and understandings developed socially and exponentially. Transactional or subjectivist epistemology - assumes that we cannot separate ourselves from what we know. The investigator and the object of investigation are linked such that who we are and how we understand the world is a central part of how we understand ourselves, others and the world”(Cohen & Crabtree, 2006, p.59). The research paradigm used for this study was the interpretivism approach. It has two assumptions: relativist ontology and transactional or subjectivist epistemology. “Relativist ontology - assumes that reality as we know it is constructed inter-subjectively through the meanings and understandings developed socially and exponentially. Transactional or subjectivist epistemology - assumes that we cannot separate ourselves from what we know. The investigator and the object of investigation are linked such that who we are and how we understand the world is a

central part of how we understand ourselves, others and the world”(Cohen & Crabtree, 2006, p. 59, Considering an aspect of sanitation in Offinso College of Education may present other views than what they people consider as a whole. In the same way, walking through the area may give a view that may be totally different from what is actually the case. The area usually referred to as “Offinso College of education” is not the same as the “Offinso College of education” that falls under the Ashanti Region Colleges of education. Interpretivism enabled the researcher to gain full understanding of the issues in the college. Interpretivism was therefore chosen because it has the potential to help the researcher gain understanding and deep insight through discovery of multiple meanings. These meanings can further enhance the understanding of the whole situation and not just parts in all its complexities. Without any statistical procedures, this approach can produce findings that can be considered trustworthy and honest (Strauss & Corbin, 1990).

This is important for the study because it provided precise information as the respondents intended it. Also, “interpretive researchers assume that access to reality (given or socially constructed) is only through social constructions such as language, consciousness, shared meanings, and instruments” (Myers, 2008, p. 38). “Interpretivism proposes that there are multiple realities, not single realities of phenomena, and that these realities can differ across time and place” (Neill, 2006). For this reason, in interpretivism study, the researcher focuses on meaning and may depend on multiple methods to help study the different aspects of the same issue (Collins, 2010, p. 38). This was possible through observation apart from the administration of questionnaire that were conducted during the study at Offinso College of Education and resulted in ability of the researcher to probe some information provided by respondents. Even though the approach is subjective in

nature with the likelihood of researcher bias due to the researcher viewpoint and values that may impact the studies. Indeed, in studying human experiences, it is impossible not to be subjective in totality. The ultimate aim studying about the sanitation situation of Offinso College of education is to offer a perspective of the situation and provide well written research report that reflects the researcher's ability to illustrate or describe the corresponding phenomenon. Sanitation issues at the Offinso College of Education are very important to the health of the many people that use the institution and so this approach helped the researcher to clearly describe the real issues concerning sanitation in the school.

3.1 The Profile of the Study Area

The Offinso Municipality falls within the Ashanti Region of Ghana. It is about 24km away from Kumasi, the administrative and commercial town of the Ashanti region. The Municipality covers an estimated land area of 1,451 square kilometers that constitutes 2.6% of the total land area of the Ashanti region (Ghana Statistical Service, 2014). Total population for the Municipality according to the Ghana Statistical Service (2019) was projected to be 138,190 as at 2014 with a growth rate of 1.6%. The Municipality has more females (51.8%) than males (48.2%) (Ghana Statistical Service, 2014). The municipality has a Nursing Training College, a College of Education, three Senior High Schools/Technical School, fifty-two public Junior High Schools and ninety-four primary schools. (Ghana statistical service, 2014) In addition, there are several Private Basic Schools as well as two Vocational Schools. The municipality has two major market centers in Kokote and Abofour in addition to several small satellite markets. The municipality has an open dump site for managing the municipal solid wastes. Over a quarter of households (39%) source of main drinking water in the Municipality is pipe-borne. The rest use wells, streams and

ponds as their main source of drinking water. The volume of treated water is inadequate and the distribution system is inefficient (Ghana Statistical Service, 2005). Fifty-five percent (55.8%) of households and most schools in the municipality have toilets. According to the Ghana Statistical Service (2005), 17.7% of households in the Municipality use water closet toilets, 16.2% of households use pit latrines. Other toilets used in the Municipality include KVIP's (6.6%), and bucket and pans (15.3%). Among households with no toilet facilities, the options used are public toilets (39.5%), different house or a neighbour's house (3.5%), bush/field (1.2%) and others (throwing into gutters and/or discarding on dumpsites etc.) form 0.1% (Ghana Statistical Service, 2005).

Offinso College of Education is a teacher education college in Offinso. The college is located in Ashanti / Brong Ahafo zone. It is one of the about 40 public colleges of education in Ghana. The college participated in the DFID-funded T-TEL programme. It was established in 1955 by the Gold Coast District of the Methodist Church as a teacher training college for women. It attained tertiary level status in September 2007 and is affiliated to the University of Cape Coast.

In September, 1971, the College was turned into mixed Institution with the enrollment of 70 first year male students. Seventy - three male students from the then Aduman Training College were transferred to the College. In 1974, the two - year post - secondary certificate "A" programme was introduced in the College. This programme was replaced with three - year post – secondary programme, which was also replaced with the current three - year diploma in basic education since September, 2005.

Beginning from 2018/ 2019 academic year, the Diploma in Basic Education programme has also been faced out with the introduction of a four - year degree programme

3.2 Research Design

The data collection approach is qualitative research approach. “One of the greatest strengths of the qualitative approach is the richness and depth of explorations and descriptions” (Myers, 2008). With a qualitative research design, the researcher is part of the study itself and must be flexible enough to follow up on observed leads and take on-the-spot decisions (Manicas & Secord, 1982). This is because qualitative research tries to study, understand and interpret things in their natural environments (Denzin & Lincoln, 2011), p. 3). This approach is appropriate for the study because it helped the researcher to clearly understand the respondents’ needs as well as their concerns from their points of view. There were also the flexibility to make some changes in the research process to address new dimensions that were originally overlooked by the researcher. The case study, an example of qualitative design, was used for the study. This approach was selected because the study organization’s activities are continuous processes and therefore will be “bounded or described within certain parameters, such as specific place and time” (Cresswell, 2013, p. 98).

According to Stake (1995), case studies are useful when the researcher wishes to understand an issue, a problem or something that is of concern. Since one institution has constantly been judged in relation to other institution, the case study helped the researcher to understand the issues concerning the institution by its own terms. Therefore, the case study provided an in-depth understanding of the case in question. This method, the researcher was able to probe further based on the answers from respondents. Also, this design allowed the use of few pictures as forms of data collected (WSP, 2012). The study used the case study design by Yin, (2004). This design consists of three basic steps. Step 1 concerns defining the case after having completed an initial review of literature. Step 2 helps to determine whether to use a

single case study or a set of several studies. The single case study “will force you to devote careful attention to that case” (Yin, 2004, p. 5). This was particularly useful for the institutional study since there was no comparison with other institute involved. Step 3 helped to determine whether to follow an existing theoretical perspective where the researcher would seek to test a hypothesis, or simply discover things from the scratch. These options gave the researcher the opportunity to choose what to do based on the research questions; that is not to follow any existing theories of sanitation in institutions in order to avoid the limitations that might have arisen with such an approach.

3.3 Population

The target population for this study was 635 students in the five departments of the Offinso College of Education in the Ashanti region of Ghana. Neuman (2007) defined population as the name for the large general group of many cases from which a researcher draws a sample. The entire group of interest for a research forms the population (Gravette & Forzano, 2006).

3.4 Sample and Sampling Procedure

A sample offer detailed information and a high degree of accuracy because it deals with relatively small number of units (Sarantakos, 1998; Gravetter & Forzano, 2006). The method adopted for selecting the sample was purposive sampling. It is a non-probability sampling technique. Neuman (2007) explained that it is often used when a researcher tackles unique cases that require in-depth information. Offinso College of Education was purposively selected since it was considered one of the best colleges of Education in Ashanti region of Ghana, Additionally the researcher had additional responsibility as environmental sanitation and health officer of the college. The

purposive sampling was used for all respondents. This is because the researcher already had in mind a predetermined or specific group from which all respondents were selected. Non-stratified random sampling is a sampling technique where a group of subjects (a sample) for study is selected from a larger group (a population). Each individual is chosen entirely by chance and each member of the population has an equal chance of being included in the sample. Non-stratified random sampling was used to select 150 respondents comprising 30 students each from the 5 departments within the college. These departments were Science, Mathematics, Languages, Social sciences and Home economics.

3.5 Instrumentation

Instruments used to collect data for the study were questionnaire.

A questionnaire consists of a list of questions relating to the aim of the study to which the respondent are required to answer (Nwana, 1990). A questionnaire was used because it is a much quicker means of collecting data from a relatively large population or sample (Fraenkel & Wallen, 2009).

3.5.1 Questionnaire

A questionnaire was prepared and administered to the respondents. Prior to designing the instrument, a thorough literature search was conducted to determine and categorize concepts and variables used in similar past studies (Freduah, 2004; Ajiboye & Ajitoni, 2008; Ifegbesan, 2010).

A questionnaire was prepared and administered to the respondents. Anticipated that literacy level of the respondents would be high. A 30 items questions was developed from literature to obtain data for the study (Appendix A). Prior to designing the instrument, a thorough literature search was conducted to determine and categorize

concepts and variables used in similar past studies (Freduah, 2004; Ajiboye & Ajitoni, 2008; Ifegbesan, 2010). These were then modified to suit the goal of the present study. The scale for the questionnaire was Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The set of questions elicited responses on issues regarding poor sanitation practices in the college, effect on poor environmental sanitation, facilities the college management provided in order to ensure good environmental sanitation and strategies which would be employed to improve on sanitation in the college.

3.6 Validity of the Research Instruments

According to Joppe (2000), validity determined whether the research instruments measures that which was intended to measure. To ensure the validity of the questionnaire it was given to my supervisor who painstakingly went through and gave the necessary suggestion and corrections to ensure its contents and face validity. Again, some of the instruments were given to colleague lecturers to scrutinize and favourable comments were received. On content validity, the instruments were given to experts in science for their comments. This yielded high dividends as these experts made modification to ensure its validity.

3.7 The Reliability of the instrument

The pre-testing of the instrument was carried out at the Wesley College of Education in Kumasi. The College was selected because it shares similar characteristics with the College under study. At the end of the pre-testing, misleading items in the instruments were revised to validate the instruments. The reliability co-efficient of 0.76 was obtained using Cronbach alpha to determine internal consistency of the questionnaire. This shows a high reliability level.

3.8 Data Collection Procedure

According to Yin (2004), qualitative data collection must be flexible and carefully planned, well executed and appropriately controlled in order to gain respect as a researcher. Permission letter (Appendix A) was taken from the Science department of the University of Education, Winneba to the management of Offinso College of Education to seek permission to involve the school in the study which was granted. The questionnaire was administered by the researcher personally. This enabled the researcher to get to the respondent directly and to enable him establish rapport with the respondents. It also enabled him to explain further parts of the questionnaire items that posed some problems to the respondents and therefore needed clarification.

After the questionnaire was issued out to the respondents, a time frame or interval of one week was allowed so that the respondents could respond to them not only as appropriate as possible but also at their own convenience. The questionnaire was administered on 150 respondents and there was 78% return rate which equates to 117 respondents. Apart from the questionnaire the interview guide was used to enrich a selected research question. Mean statistics was used to answer the research questions. Arithmetic mean of 2.5 was used to interpret the analysed data. Items with a mean of 2.5 and above were accepted while items having their mean below 2.5 were rejected.

3.9 Data Analysis

Modes of data analysis in a qualitative study often provide various avenues for a number of opportunities to discern, examine, compare and contrast, as well as interpret meaningful themes or patterns that form the findings of the study. According to Miles and Huberman (1994), qualitative data can be analysed in stages such as data reduction, data display, and conclusion drawing and verification. The framework for

qualitative data analysis by Miles and Huberman (1994) explained that at the reduction phase, data collected is simplified and transcribed for easy manageability. At the display stage, data is put in appropriate themes to help the researcher in extrapolation. The display stage is also likely to expose new dimensions of the study. The conclusion drawing and verification stage provides the analysis special appeal in the sense that it is at this stage that the findings are critically analysed vis-a-vis the research questions. Since data was collected from a single institution, an intra-case analysis was used. For the study, data analysis was manually done. Even though the same questionnaire was used, the interactions often produced new insights. The responses were initially well written down. They were later grouped under various relevant headings taking into consideration the research questions and conceptual framework. The broad headings include access to sanitation hardware to address the issue of what must be put in place to promote sanitation; sanitation promotion to help explain how people get to know what they must, can and cannot do; and the enabling environment which address the issue of the efforts that must be made to sustain sanitation promotion. These criteria formed the basics of sanitation promotion in this study.

3.10 Scoring of Instruments

The responses to the questionnaires were pooled, edited and scored. Nominal values were assigned to the items according to scales. Certain Information generated from the data was assigned ordinal values to help rate them. The items on environmental perception and attitudes had an assigned score of 1-5 (Likert scale) for "strongly disagree", "disagree", "not certain", "agree" and "strongly agree" respectively for every positively worded statement. The scoring was reversed for every negatively worded statement. On sanitation facilities, "yes" was assigned 2 and "no" 1. On practices, all

the questions that required choosing from always", 'sometimes' and "never" were assigned scores of 1-3 respectively, average/satisfactory, 1-poor and 1 -very Poor. For purposes of rating, their perceptions and attitudes on the environment were rated into three categories as, "good", "fair" and "poor". This was achieved by putting very good and good together as "good" taking average/ satisfactory as "fair" and joining poor and very poor together as "poor". On sanitation practices, the responses were categorized into three, good, fair and poor. A good practice was scored 3, a fair practice was scored 2, and a poor practice was scored.

3.11 Ethical Considerations

The researcher assured the respondents that whatever they would say by way of information would remain confidential. The researcher explained the purpose of the study to the respondents. This was done to avoid deception. Not only the above, the researcher also sought the consent of the College authorities before collecting the data. All respondents gave out information voluntarily for the study. The goal of ethics in research is to ensure that no one is harmed or suffered adverse consequences from participating in research activities (Cooper & Schindler, 2003).

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Overview

This chapter presents the results gathered from the responses of the respondents (students) to response to the questionnaire items. It also contains the analysis of the various responds from students. The discussion is also presented under this chapter.

4.1 Results

The results of the analyses are presented below in accordance with the research questions.

Research Question 1:

What are the causes of poor sanitation practices in Offinso College of Education in the Ashanti Region of Ghana?

Table 1: Mean ratings of the responses of respondents on the causes of poor sanitation practices in Offinso College of Education

S/N Item Statement	\bar{X}	SD	Remarks
1. Inadequate Hygiene education	3.23	0.90	Accepted
2. Lack of Health facilities	3.08	0.92	Accepted
3. Insufficient water supply	3.02	0.95	Accepted
4. Inadequate toilet/latrine facilities	2.99	0.61	Accepted
5. Lack of dustbins for disposing wastes like chocolates and biscuits wraps.	3.03	0.88	Accepted
6. Throwing rubbish anywhere in the compound	3.34	0.78	Accepted
7. Inadequate Funds to provide sanitation	2.81	0.95	Accepted
8. Poor waste storage methods adopted	3.18	0.85	Accepted
Grand Mean	3.09	0.90	Accepted
\bar{X} = Mean SD = Standard Deviation			

From Table 1, all the items had means above 2.5 showing that the respondents rejected all the items stated as the causes of poor sanitation in Offinso College of Education. This shows that, the main causes of poor sanitation are not inadequate hygiene education, neglect of health facilities, insufficient water supply, inadequate toilet/latrine facilities, lack of dustbins for disposing wastes, throwing rubbish anywhere in the compound, inadequate funds to provide sanitation equipment and poor waste storage methods adopted. The Standard Deviation ranged from 0.61-0.95 which showed that the respondents are not too far from each other in their responses.

Research Question 2:

What are the effects of the poor sanitation practices on students' health in Offinso College of Education?

Table 2: Mean ratings of the Respondents on the effects of poor sanitation practices on students' health in Offinso College of Education.

S/N	Item Statement	\bar{X}	SD	Remarks
1.	Poor sanitation can cause diarrhoea for students.	3.54	0.73	Accepted
2.	Poor sanitation can cause typhoid for students.	3.36	0.86	Accepted
3.	Poor sanitation can cause cholera for students.	3.33	0.82	Accepted
4.	Poor sanitation can lead to stunted growth in students.	2.40	1.03	Rejected
5.	Poor sanitation can lead to malnutrition.	2.24	1.01	Rejected
6.	Poor sanitation can lead to malaria.	3.44	0.79	Accepted
7.	In extreme cases, poor sanitation can lead to student mortality.	2.85	0.79	Accepted
Grand Mean		3.02	0.86	Rejected
\bar{X} = Mean SD= Standard Deviation				

From Table 2, it shows that the respondents rejected items 1, 2, 3, 6 and 7 while they accepted items 4 and 5. This shows that the effects of poor sanitation on students' health do not include diarrhoea for students, typhoid, cholera, malaria and student mortality in extreme cases. The respondents however accepted stunted growth and malnutrition as effects of poor sanitation. The SD ranged from 0.74-1.01 which showed that the respondents are not too far from each other in their responses

Research Question 3:

In what ways have the school management contributed in providing facilities that will enhance sanitation practices in Offinso College of Education?

Table 3: Mean ratings of the respondents on the ways the school management has contributed in providing facilities that will enhance sanitation practices in Offinso College of Education.

S/N	Item Statement	\bar{X}	SD	Remarks
1.	Provision of hygiene education	2.46	1.06	Rejected
2.	Employing cleaners to keep the environment clean	3.43	0.67	Accepted
3.	Provision of dustbins/ rubbish bins all over the school	2.36	0.91	Rejected
4.	Proper maintenance of health facilities	2.21	0.93	Rejected
5.	Adequate supply of clean water	2.28	0.95	Rejected
6.	Encouraging individuals to engage in environmental sanitation research	2.91	1.01	Accepted
Grand Mean		1.74	0.61	Rejected
X= Mean SD= Standard Deviation				

From Table 3, the respondents rejected items 2 and 6 while they accepted items 1, 3, 4 and 5. This shows that the respondents do not agree that the school management employs cleaners to keep the environment clean and the school do not encourages individuals to engage in environmental research. The respondents however accepted provision of hygiene education, adequate supply of clean water, proper maintenance of health facilities and provision of rubbish bins as ways in which the school management has provided facilities to ensure proper sanitation within the school. The SD ranged from 0.68-1.07 which showed that the respondents are not too far from each other in their responses.

Research Question 4:

What are the strategies that could be employed to improve sanitation in Offinso College of Education?

Table 4: Mean Responses of the Respondents on Strategies that could be employed to Improve Sanitation in Offinso College of Education.

S/N	Item Statement	\bar{X}	SD	Remarks
1.	Need for environmental Sanitation Research.	2.91	0.61	Accepted
2.	The need for students to undertake hygiene education.	3.56	0.63	Accepted
3.	More health workers should be trained to include sanitation practices counselling into their consultation with patients.	3.49	0.77	Accepted
4.	More toilets should be put in place in strategic locations to complement the existing one to reduce incessant urination and faecal deposits.	3.38	0.76	Accepted
5.	Impromptu inspection around the campus from time to time.	3.48	0.78	Accepted
6.	Management should source for more funds from local and international level which would be used for providing sanitation facilities.	3.43	0.78	Accepted
7.	Waste disposal vehicles should be procured so that waste can safely be removed.	3.38	0.78	Accepted
8.	Partnership should be establish with private agency to help convert waste to wealth through waste reduction, reused and recycling.	3.33	0.73	Accepted
9.	Regular seminars should be organised on the need for sanitation.	3.47	0.65	Accepted
Grand Mean		3.40	0.72	Rejected
\bar{X} = Mean				
SD = Standard Deviation				

From Table 4, all the items were rejected showing that the respondents agree that all the items mentioned are strategies that can be adopted to improve sanitation practices in the Offinso College of Education. The SD ranged from 0.62-0.79 which showed that the respondents are not too far from each other in their responses.

4.2 Discussion of Findings

The findings from Table 1 indicate that the causes of poor sanitation are inadequate hygiene education, neglect of health facilities, insufficient water supply, inadequate toilet/latrine facilities, lack of dustbins for disposing wastes, throwing rubbish anywhere in the compound, inadequate funds to provide sanitation equipment and poor waste storage methods adopted. The findings are supported by Danida (2007) when he said that schools often suffer from non-existent or insufficient water supply, sanitation and hand washing facilities, dirty and unsafe water supply; toilets or latrines that are not adapted to the needs of students particularly girls; nonexistence of hygiene education, unhealthy and dirty classrooms/school compounds among others. Also, the findings are also supported by Ogawa (2005), who revealed that lack of sanitation, unsafe disposal or storage of waste in/around houses and streets, and in undesignated containers may provide habitats for vectors of diseases that cause various infectious diseases including typhoid fever and diarrhoea.

The findings from Table 2 shows that the effects of poor sanitation on students' health include students being affected by diarrhoea , students being affected by typhoid, students falling sick due to cholera infection, students being sick due to malaria and student mortality in extreme cases. The findings is supported by WHO (2007) when it estimated that 88% of diarrhoea disease is caused by unsafe water supply and inadequate sanitation and hygiene. Also, Snel (2004) and Water Aid Uganda (2013) backed up the findings when their study discovered that diarrhoea which is caused by poor sanitation kills 1.5 million children each year.

The findings from Table 3 indicate that the school management employs cleaners to keep the environment clean and the school encourages individuals to engage in

environmental research. This is supported by Thor (2005) when he noted that a major way of solving environmental sanitation issues is the encouragement of research into environmental sanitation.

Finally, the findings from Table 4 indicate that the ways in which sanitation practices can be improved include; need for environmental sanitation research, the need for students to undertake hygiene education, more health workers should be trained to include sanitation practices counselling into their consultations with patients, more toilets should be put in place in strategic locations to complement the existing ones to reduce incessant urination and faecal deposit, impromptu inspection around the campus from time to time, management should source for more funds from local and international levels which would be used for providing sanitation facilities, waste disposal vehicles should be procured so that waste can safely be removed, Partnership should be established with private agencies to help convert waste to wealth through waste reduction, reuse and recycling and regular seminars should be organized on the need for sanitation. The findings are supported by WHO and UNICEF (2012) when they stated that sanitation involves having access to facilities for the safe disposal of human waste (faeces and urine), as well as having the ability to maintain hygienic conditions, through services such as garbage collection, industrial/hazardous waste management, and wastewater treatment and disposal.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Overview

This is the final chapter of the study. It has four sections comprising the summary of major findings of the study, the conclusions drawn, recommendations and suggestions for further study. The recommendations are based on the findings of the study.

5.1 Summary of Main Findings

From the analysis of the data in the study, the following were the major findings:

1. Sanitation in Offinso College of Education have been observed to be poor. This is due to a number of factors such as inadequate hygiene education, neglect of health facilities, insufficient water supply, inadequate toilet/latrine facilities, lack of dustbins for disposing wastes, throwing rubbish anywhere in the compound, inadequate funds to provide sanitation equipment and poor waste storage methods adopted.
2. Effect of poor sanitation leads to students' ill health which can lead to failure of students in their academic work. Effects of poor sanitation on student health is manifested in students being sick due to diseases like malaria, cholera, diarrhoea, and even death in extreme cases.
3. School management have devised means of ensuring proper sanitation. These ways include employing cleaners to keep the environment clean and encouraging people to undertake research in environmental sanitation. However, these aren't enough to ensure proper sanitation.
4. Ensuring sanitation in schools involves a lot of ways which should preferably be used together instead of adopting these methods in isolation. The methods

include; the need for students to undertake hygiene education, more health workers should be trained to include sanitation practises counselling into their consultations with patients with school sick bays, more toilets should be put in place in strategic locations to complement the existing ones so as to reduce incessant urination and faecal deposit.

5. It was discovered that most respondents had an idea of communicable diseases that is being associated with indiscriminate solid waste disposal. The predominant communicable disease that the respondents knew of was diarrhoea.
6. This study again also revealed that most respondents agreed that enforcement of sanitation by-laws could help manage the disposal of solid waste in the area.
7. There are therefore specific strategies that have been put in place to improve on good sanitation practices. They include the need for environmental sanitation research, the need for students to undertake hygiene education, more toilet should be put in place in strategic locations to complement the existing one to reduce incessant urinating and faecal deposit. Impromptu inspection around the campus from time to time, and also more health workers should be trained to include sanitation practices counselling into their consultation with students at school sick bays.

5.2 Conclusions

Sanitation can be seen as the policy and practice of protecting health through hygienic measures. Sanitation is necessary in all places which includes schools. School sanitation refers to hygienic practices that occur in schools. However, sanitation in institutions have been observed to be poor. This is due to a number of factors such as

inadequate hygiene education, neglect of health facilities, insufficient water supply, inadequate toilet/latrine facilities, lack of dustbins for disposing wastes, throwing rubbish anywhere in the compound, inadequate funds to provide sanitation equipment and poor waste storage methods adopted. Poor sanitation has led to negative effects on students' health. Poor sanitation leads to students' ill health which can lead to failure of students in their academic work. Effects of poor sanitation on student health is manifested in students being sick due to diseases like malaria, cholera, diarrhoea, and even death in extreme cases.

Due to these negative effects, school management have devised means of ensuring proper sanitation. These ways include employing cleaners to keep the environment clean and encouraging people to undertake research in environmental sanitation. However, these aren't enough to ensure proper sanitation. Ensuring sanitation in schools involves a lot of ways which should preferably be used together instead of adopting these methods in isolation. The methods include; the need for students to undertake hygiene education, more health workers should be trained to include sanitation practices counselling into their consultations with patients, more toilets should be put in place in strategic locations to complement the existing ones so as to reduce incessant urination and faecal deposit, impromptu inspection around the campus from time to time. Management should source for more funds from local and international levels which would be used for providing sanitation facilities, partnership should be established with private agencies to help convert waste to wealth through waste reduction, reuse and recycling and regular seminars should be organized on the need for environmental sanitation. If these methods are used in synergy instead of in isolation, the menace of poor sanitation and its negative effects on students' health can be stopped or at least reduced to a manageable level.

5.3 Recommendations

Based on the findings, the following recommendations were made;

1. The school management has to ensure that the various ways of improving sanitation within the institution are used in synergy instead of in isolation due to fact these methods are all important.
2. The government at all levels should provide the necessary funds needed by the school management to ensure the procurement of various facilities/equipment needed for students to live in a hygienic environment.
3. The school management have to ensure that those in charge of cleaning the school environment are adequately monitored so as to ensure they discharge their duties properly.
4. School authorities should also ensure that waste bins, urinals and toilets are cleaned regularly to make them attractive to users by making posters and/or flyers that informs students on the need to keep the sanitation facilities clean.
5. Educators must make and effectively enforce sanitary rules in the schools by punishing offenders to ensure compliance by all. Offenders can be made to clean the sanitation facility for a week.
6. Schools must organize workshops on proper sanitation practices for students regularly. In addition, films/documentaries on environmental pollution and effects on various living organisms including human beings and the world must be shown to students.
7. School management should ensure adequate sanitation facilities including covered bins, hand washing facilities with soaps provided.
8. Educators must consistently remind students on the need to wash hands always after each use of the toilet/urinal and dispose of their waste properly.

This can be done by making posters to that effect and placing them at vantage points, especially in and around toilet facilities, close to dustbins, canteen place and inside the classrooms.

9. Periodically, drama groups in the schools must get story lines on sanitation issues and act them for their colleagues. This would make sanitation issues take precedence in students minds thereby affect their attitudes and consequently practises.
10. The school children must have a project every term to design flyers on sanitation practices. The best flyer designer must be rewarded.
11. The school management must motivate Sanitation Inspectors appropriately to encourage them to do their work well and the also must place heavy sanctions on offenders who are brought before them to serve as deterrent to the entire population.
12. The school management must in addition to above, set up Para-military groups within the students (garbage police) to impose penalty (fines) on people who break the environmental laws on the spot.

5.4 Suggestion for Further Research

Since society continues to be dynamic with continuous changes in societal needs there is always the need for further research to be conducted into many aspects of education at all levels to meet the aspiration of society. It is therefore suggested that: environmental sanitation issues are broad, the researcher would wish to extend the study to cover other environmental parameters like pollution, degradation, sustainability, waste disposal methods and use, reuse and recycle of waste

REFERENCES

- A Report for Global Environmental Monitoring System. Brazil. Blackwell, Oxford, UK.
- Academy Health (2007). *Health service research methods*. Retrieve from Academy Health website www.hsrmethods.org
- Adeniji, G., & Afolabi, F. (2010). Resulting gender issues in accessibility and operation of sanitation services provided by private sector in Nigeria. *Journal of Applied Sciences in Environmental Sanitation*, 5(4), 411-417.
- Aiken, L. (2002). *Attitudes and related psychosocial constructs: Theories, assessment, and research*. Thousand Oaks, CA: Sage Publications.
- Ajiboye, J. O., & Ajitoni, S. O. (2008). Effects of full and quasi-participatory learning strategies on Nigerian senior secondary students' environmental knowledge: implications for classroom practice. *International Journal of Environmental and Science Education*, 3(2), 58-66.
- Albuquerque, C. (2009). *Report of the independent expert on the issue of the human rights obligations*. Related to access to safe to safe drinking water and sanitation. A/HR/12/24: Website publication [http:// www 2.Ohchr.Org/english/bodies/hrcouncil/docs/12 session//A-HRC-12-24_Epdf](http://www.2.Ohchr.Org/english/bodies/hrcouncil/docs/12_session//A-HRC-12-24_Epdf).
- Allison, M. C. (2002). Balancing responsibility for sanitation. *Social Science and Medicine*, 55(9), 1539-1551.
- AMA - Metro Planning Coordinating Unit. (2008). *AMA market assessment report*. Retrieved from www.ama.gov.gh/resources/docs.markets%20report.pdf
- Amoah, P., Dreschsel, P., Abaidoo, R. C., & Henseler, M. (2007). Ivegetable production in Ghana: microbiological contamination in farms and markets and associated consumer risk groups. *Journal of Water and Health*, 5(3), 455-466.
- Atuahene, O. G. (2010). Social effects of poor sanitation and waste management on poor urban communities: A neighbourhood-specific study of Sabon Zongo, Accra. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 3(2), 145-160.
- Awuah-Nyamekye, S. (2012). *Divination: Its nature and meaning in Berekum Traditional Area* Verlag: Lap Lambert Academic Publishing GmbH & Co KG.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychology*, 44(9), 1175-1184.

- Bartram, J., & Cairncross, S. (2010). Hygiene, sanitation and water: The forgotten foundations of health. *PLoS Medicine*, 7(11), 16-22.
- Bartram, J., Lewis, K., Lenton, R., & Wright, A. (2005). Focusing on improved water and sanitation for health. *The Lancet*, 36(9461), 810-812.
- Bassis, L. (1998). *Waste disposal*. Retrieved March 2011, from <http://www.wastedisosal.htm>
- Baum, B., & Parker, C. H. (1974). *Solid waste disposal*. Ann Arbor.
- Black, M., & Fawcett, B. (2008). *The Taboo: Opening the door on global sanitation crisis*. Earthscan: New York, NY, USA.
- Bramley, S., & Breslin, E. (2010). *Sanitation as a business: A new spin on the challenge of sanitation operation and maintenance. Sustainable Sanitation Practice*. Retrieved from http://sswm.info/sites/default/files/reference_attachments/BRAMLEY%20and%20BRESLIN%20201Sanitation%20as%20a%20Business.pdf
- Burton, S., Harpham, T. and Blue, I. (2000) An evaluation of healthy city projects in developing countries. Health Promotion Division of the World Health Organisation, Geneva.
- Cairncross, S. (2010). *Do we really need more research in sanitation?* Presentation from the 2010 World Water Week in Stockholm. Retrieved from www.waterrgovernance.org/documents/WWW_PDF/2010/tuesday/k12/samn_caircross.pdf
- Carlsen, J., Getz, D., & Ali-Knight, J. (2001). The Environmental Attitudes and Practices choice. *Journal of Leisure Research*, 24, 207-224
- Chan, N. I. (2008). *The impact of climate change on human health*. Geneva, United States of America: WHO.
- Chu, W. S. (2009). *The role of shopping centres in community development in Hong Kong*. (MA Housing Management dissertation). University of Hong Kong, Hong Kong.
- Cohen, D. & Crabtree, B. (2006). Qualitative research guidelines project. Robert Wood Johnson Foundation. Retrieved from <http://www.qualres.org/index.html>
- Cohen, L. & Manion, L. (1986). *Research methods in education* (6th ed.). London and New York: Routledge.
- Collins, H. (2010). Creative research: *The theory and practice of research for the creative industry*. Retrieved from <http://books.google.co.in/book7hl> Columbia

- Columbia University. (2012). Millennium cities initiative. Retrieved from Columbia University website: <http://www.earth.columbia.edu/articles/view/1751>
- Cooper, P. S., & Schindler, D. R. (2003). *Business research methods* (8th ed.). New York: McGraw Hill.
- Coppens, O. (2005). Preliminary literature study to a School Sanitation and Hygiene Education (SSHE) Strategy. Retrieved on 13 March 2012 from: <http://www.protos.be/temas->
- Coppens, O. (2005). *Preliminary literature study to a School Sanitation and Hygiene Education (SSHE) Strategy*. Retrieved from <http://www.protos.be/temas-es/PROTOSSHEstrategy.pdf>, accessed 13 November 2016.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Sage Publications. Thousand Oaks, CA: Sa
- Crook, R., & Aryee, J. (2006). Urban services partnership, 'street-level bureaucrats' and environmental sanitation in Kumasi and Accra, Ghana: coping with organizational change in the public bureaucracy. *Development of Policy Review*, 24, 51-73.
- Croyle, R.T. (2005). *Theory at a glance: Application to health promotion and health behavior* (2nd ed.). U.S. Department of Health and Human Services, National Institutes of Health.
- Curtis, V. & Kanki, B (1998). Hygiene promotion in Burkina Faso. *African Health*, 20(2), 11-12.
- DANIDA (2010). *Reaching the MDG target for sanitation in Africa - a call for realism*. Ministry of Foreign Affairs of Denmark, Good Practice Notes. Retrieved from Ministry of Foreign Affairs of Denmark website: www.ircwash.org/resources/reaching-mdg-target-sanitation-Africa-call-realism.
- Daramola, O. (2012). Clapping with one hand: the case of urban environmental sanitation practices in Nigeria. *Journal of Applied Technology in Environmental Sanitation*, 2(4), 233.
- Davies, M., & Cornwell, D. (1998). *Introduction to Environmental Engineering* (3rd ed.). New York: WCB McGraw-Hill.
- Davies, M., & Cornwell, D. (1998). *Introduction to environmental engineering* (3rd ed.). New York: Sage.
- Dearing, J. (2009). Diffusion of innovation theory to intervention development. *Research on Social Work Practice*, 19(5), 503-5.

- Denzin, N. K., & Lincoln, Y. S. (Eds.). (2005). *The discipline and practice of qualitative research: The SAGE Handbook of Qualitative Research* (3rd ed.). Thousand Oaks, CA: Sage.
- Department of Environment and Conservation (1999). Environmental guidelines: Assessment, classification & management of liquid and non-liquid Wastes. Sydney: Department of Environment and Conservation (NSW).
- Diamontopoulos, A., Schlegelmilch, B. B., Sinkovics, R. R., & Bohlen, G. M. (2003). Can socio-demographic still play a role in profiling green consumers? A review of the evidence and empirical investigation. *Journal of Business Research*, 56, 465- 480.
- Domfeh, K. A. (1999). Some environmental factors affecting health in greater Accra Metropolitan Area. *Ecological Restoration, Environmental & Science Education*, 3, (3), 105-114
- Dorn, R. C., Reddy, C., Lamphere, D., Gaeuman, J., & Lanese, R. (1985). Municipal Sewage Sludge Application on Ohio Farms: Health Effects. *Environmental Research*, 38, 332-335.
- Dougall, J., & McGahey, C. (2003). Urban Environmental Health Strategies, three Community based Environmental Sanitation and Hygiene Projects conducted in the DR-Congo, Arlington, VA: Environmental Health Project.
- Dreibelbis, R., Winch, P. J., Leontsini, E., Hulland, K. R. S., Ram, K. P., Unicomb, L., & Luby, S. P. (2010). The Integral Behavioural Model for water, sanitation and hygiene: A systematic review of behavioural models and a framework for designing and evaluating behaviour change interventions in infrastructure-restricted settings. *BMC Public Health*, 13, 1015.
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth, TX: Harcourt Brace Jovanovich.
- Egun, N. K. (2011). Market decomposable waste utilization: Implication for environmental sanitation in Delta State. *Journal of Applied Technology in Environmental Sanitation*, 1(1), 45-52.
- EHP and Partners (2004). Joint publication 8. The hygiene improvement framework. a comprehensive approach for preventing childhood diarrhoea. Retrieved from http://www.ehproject.org/PDF/Joint_Publications/JP008-HIF.pdf
- Enu, P. (2013). Sanitation as a catalyst for economic development: A case study of Kaneshie municipality, Accra, Ghana. *Social and Basic Sciences Research Review*, 2(1), 29-44.
- Environmental Programme (UNEP). (2005). Annual Report 2005. Retrieved from <http://www.unep.org>

- Environmental Protection Agency (EPA). (1999). *Environmental assessment regulations. 1999: Arrangement of Regulations*. Published by Minister of the Environment, Accra. Rulling Docket. Date of Enforcement 24 June 1999.
- Environmental Protection Agency. (1999). Five Year Strategic Plan 1999 to 2003, Accra, Ghana.
- Environmental Protection Agency. (2007). *Municipal Solid waste Generation Recycling and Disposal in the United States: Facts and figures*, Washington, DC. U.S.A.
- ENVIS Centre, (2010). Annual progress Report of ENVIS Centre on “Wildlife and Protected Areas, Wildlife institute of India. Dehradun (2009-2010)
- Erasmus, M., & Friend, J. (1992). New directions in software for strategic choice. *European Journal of Operational Research*, 61, 154-164.
- Esa, N. (2010). *Environmental knowledge, attitude and practices of student teachers*. Esrey: SA.
- Evans, B., Hutton, G., & Haller, L. (2004). Closing the sanitation gap - *the case for better public funding of sanitation and hygiene*. Retrieved from IRC website:
- Evans, B., Vandervoorden, C. & Peal, A. (2009). *Public funding for sanitation - The many faces of sanitation subsidies*. Geneva, Switzerland: Water supply and sanitation collaborative Council.
- Fekade, W. (2000). *Deficits in formal land management and informal responses under rapid urban growth: an international perspective*. Gender, environment and epidemiology in Greater Accra Metropolitan Area: Ghana.
- Fishbein, I., & Ajzen, M. (1980). *Understanding attitudes and predicting social behavior*. New Jersey: Prentice-Hall, Upper Saddle River.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behaviour: an introduction to theory and research*. Reading, MA: Addition-Wesley.
- Fobil, J. N. (2000). *Municipal solid waste characterization for integrated management in the Accra metropolis*. (MSc. Thesis.), Accra: University of Ghana, Legon.
- Fortner, R., Bjerre, J. & Evans, B. (2000). Public Understanding of Climate Change: certainty and Gas Emissions? *Social Science Quarterly*, 83(1), 1-17.
- Fortner, R., Bjerre, J., & Evans, B. (2002). Public understanding of climate change: Certainly and Gas Emissions? *Social Science quarterly*, 83(1), 1-17.

- Fraenkel, R. J., & Wallen, E. N. (2009). *How to design and evaluate research in education*. New York: McGraw Hill.
- Freduah, G. (2004). Problems of solid waste management in Nima, Accra. Retrieved March 9, 2011, from Undergraduate *Research Journal for the Human Sciences*: <http://www.kon.org/urc/v6/george.html>
- Freduah, G. (2004). *Problems of Solid Waste Management in Nima*. Accra: University of Ghana, Legon. University Press.
- Freduah, G. (2007). Problems of solid waste management in Nima, Accra. *Undergraduate Gas Emissions? Social Science Quarterly*, 83, (1); 1-17
- Freduah, G. (2007). Problems of Solid Waste Management in Nima, Accra. *Undergraduate Gas Emissions? Social Science Quarterly*, 83(1), 1-17
- Friend, J. (1992). New directions in software for strategic choice. *European Journal of Operational Research*, 61, 154-164.
- Friend, J. (1992). New discussion in software for strategic choice. *European Journal of Operational Research*, 61, 154-164.
- Gambro, J. S., & Switzky, H. N. (1994). The national survey of environmental knowledge in high school students: Level of knowledge and related variables. *American Educational Research* pp. 2-41.
- Gangwar, K., Deepali K., & Gangwar, R. S. (2012). Urban residential refuse decomposition and generation rate in Haridwar City, Uttarakhand State, India. *Journal of Applied technology in Environmental*.
- Gerba, C. (1986). Development of a qualitative pathogen risk assessment methodology for municipal sludge. Retrieved January 17, 2021, from EPA: <http://cfspub.epa.gov/incea/cfm/recordisplay.cfm?PrintVersion=True&deid=36752>
- Gerba, C. (1986). Development of a qualitative pathogen risk assessment methodology for municipal Sludge. Retrieved January 17, 2011, EPA: <http://cfspub.epa.gov/incea/cfm/recordisplay.cfm?PrintVersion=True&deid=36752>.
- GESAMP (2001). Protecting the Oceans from Land-Based Activities. Land-based and Activities Affecting the Quality and Uses of the Marine, Coastal and Sources Associated Freshwater Environment Nairobi: UNEP.
- Ghana News Agency. (2014). August 6). Traders clear filth in Accra Market. Retrieved from www.ghananewsagency.org/health/traders-clear-filth-in-accra-79145

- Ghana Statistical Service (2013) 2010 PHC Regional Analytical Report Ashanti Region Kumasi.
- Ghana Statistical Service (2014). *2010 population & housing census report: District analytical report*. Offinso Municipality.
- Ghana Statistical Service. (2005). 2000 Population and Housing Census Analysis of District Data and implications for Planning- Ashanti Region: Ghana statistical service.
- Government of Nepal. (2011). Sanitation and Hygiene Master Plan by Sterling Committee for National Sanitation action. Retrieved from www.washingschoolsmapping.com
- Gravetter, F. J., & Forzano, L.B. (2006). *Research methods for the behavioural Sciences* (2nd ed.). Publisher: Belmont, USA Thomson Wadsworth ISBN....
- Green, A. (2011). Solid Waste management problems in secondary schools in Ibadan, Nigeria. *Journal of Environmental Health*, 60, 210-215.
- Green, J., de Week, O., & Suarez, P. (2013). Sustainable urban sanitation: Simulating a desludging service in Senegal. Retrieved from www.web.mit.edu/deweck/Public/Full/FPR-de-Weck-Jul-1-2012.docx
- Habitat, U. N. (2007). Framework for global water operators partnerships alliance. *Water, Waste Management & Research*, 24(6), 505-513.
- Hadi, A. (2000). A participatory approach to sanitation: Experience of Bangladeshi NGOs. *Health Policy and Planning*, 15,(3), 332 – 337
- Harvey, P. A. (2008). Environmental sanitation crisis: MORE than just a health issue. *Environmental Health Insights*, 2. Retrieved from www.ncbi.nlm.nih.gov/pmc/articles/pmc3091339/
- Harvey, P. A., & Mukosha, L. (2008). Community-led total sanitation: Lessons from Zambia. Retrieved from Livelihood Zambia website http://www.livelihoods.org/hot_topics/CLTS/Zambia.htm
- HausmannMuela, S., R. J. Muela and I. Nyamongo. 2003. Health-seeking behaviour and the health system's response. DCPD Working Paper no. 14. Give web address?
- Health Foundation of Ghana. (2009). Environmental hygiene. Ghana health digest. Hesperian Foundation & United Nations Development Programme.
- Hesperian Foundation & United Nations Development Programme (2005). *Sanitation and cleanliness for a Health Environment*, Berkeley California: Hesperian Foundation.

- Hirschboeck, K .K. (1988). Flood hydroclimatology, in Baker, V.R., Kochel, .C, and Patton, P ..C., Flood Geomorphology, John Wiley & Sons, 27 49
- Holdren, J. K., & Smith, K. R. (2002). (Eds.), World Energy Assessment. Energy and the Challenge of Sustainability. New York: UNEP.
- Hossain, M. & Howard, P. (2014). The sanitation access to developing Asia : India's performance over 2001 and 2011". *World journal of science , Technology and sustainable Development, vol. 11* No. 2, pp.93 -101.
- Howard, G., & Bartram, J. (2003). Domestic water quantity, service level and health. Retrieved from http://cdrwww.who.int/water_sanitation_health/diseases/WSH03.02.pdf
- Huebsch, R. (1999). *Demand Medici Inc.* ehow.com. Retrieved February 11, 2011, from. Harmful Effects of Plastic Waste Disposal: http://i.ehow.co.uldabout_5591699_harmfuleffects-plastic-waste
- Hunter, L. M. (2000). A comparison of the environmental attitudes, concern, and behaviour of native-born and foreign born U.S. Residents. *Popul Environ* 21, 565-580. <http://doi.org/10.1007/BF02436772>
- Hutton, G., Haller, L., & Bartram, J. (2007). Global cost-benefit analysis of water supply and sanitation interventions. *Journal of Water and Health*, 5(4), 481-502.
- Ifegbesan, A. (2010). Exploring secondary school students' understanding and practices of waste management in Ogun State, Nigeria. *International Journal of Environmental Science Education*, 5(2), 201-215
- Iheke (2010). *Impact of workers' remittances on efficiency and welfare of rural smallholder arable crop households in south eastern Nigeria.* A PhD dissertation, Michael Okpara University of Agriculture, Umudike, Nigeria.
- International Water Association (IWA), (2006). Sanitation 21: *Simple approaches to complex sanitation, a draft framework for analysis.* London, UK: International Water Association.
- Janz, N. K. & Becker, M. H. (1984). The health belief model: A decade later. *Health Education*, 11(1), 1-47.
- Jenkins, M. W., & Scott, B. (2007). Behavioural indicators of household decision-making and demand for sanitation and potential gains from social marketing in Ghana. *Soc. Sci. Med.*, 64(12), 2427-2442.
- Johnson, J. W. (2000). A heuristic method for estimating the relative weight of predictor variables in multiple regression. *Multivariate Behavioural Research*, 35, 1-19.

- Joppe, M. (2000). The research process. *The Quantitative Report Journal*, 8(4), 597-607.
- Kaliyapermal, K. (2004). Guideline for conducting: A knowledge, Attitude and Practice (KAP) Study. *AECS Illumination*, IV, No.1, Jan - Mar.
- Kariuki, P. (2011). The challenges of financing sanitation in sub-Saharan countries a critical perspective. *Journal of Applied Technology in Environmental Sanitation*, 7(1), 9-16.
- Karr, K., and Pasteur, (2005). Subsidy of self-respect?: community led total sanitation ; an update to recent developments. *Working Paper Series*, 257. Brighton: IDS. Retrieved from <http://bldscat.ids.ac.uk/cgi-bin/koha/opacdetail.pl?biblionumber154662>
- Konradsen, F., Bjerre, J. & Evans, B., (2010). *Reaching the MDG target for in Africa: a call for realism sanitation*. Copenhagen, Denmark, Danida, Ministry of Foreign Affairs.
- Konteh, F. H. (2008). Urban sanitation and health in the developing world: reminiscing the nineteenth century industrial nations. *Health & Place*, Vol. 15 (2009) 69. Retrieved from [www.wsscc.org/sites/default/files/publications/12_krukkert_hygiene.roniotion for men 2010. pdf](http://www.wsscc.org/sites/default/files/publications/12_krukkert_hygiene.roniotion%20for%20men%202010.pdf)
- Kreuger, L. W., & Neuman, W. L. (2006). *Social work research methods: Quantitative and qualitative applications*. New York: Pearson education Inc.
- Kumie, A., & Ali, A. (2005). An overview of environmental health status in Ethiopia with Particular emphasis to its organization, water and sanitation: a literature survey. *Ethiopia Journal of Health and Development*, 19(2), 89-103.
- Lancet, 2010, editorial. Water and sanitation become human rights, albeit turbidly. *The Lancet* 376, August 7,
- Lavallin, S. N. C. (1996). 192 A.R. 1(QB) (Plaintiff) v. liquid carbonic Inc. (defendant) (Action No. 9201-05818)
- Loevinsohn, BP, Guerrero, ET, and Gregorio, SP, (1995). Improving primary health care through systematic supervision: a controlled field trial. *Health Policy Plan* (10), 144-153.
- Lopez, A. D., Mathers, C. D., Ezzati, M., Jamison, T., & Murray, C. J. L., (2006). Global and regional burden of disease and risk factors 2001: systematic analysis of population health data. *Lancet*, 367(9524), 1747-1757.
- Lyse, O. (2003). *Waste disposal haunts cities: Management in third world cities*. London and New York: Routledge

- Mallick, D. L. (2010). Chapter 5 Amplifying the Community voices for greater access to drinking water in Bangladesh. Shaw, R. and Thaitakoo, D. (Ed.). *Water Communities (Community, Environment and Disaster Risk Management, vol. 2)*; Emerald Group Publishing Limited, Bingley, pp. 69-91. [https://doi.org/10.118/S2040-7262\(2010\)0000002008](https://doi.org/10.118/S2040-7262(2010)0000002008)
- Manicas, P. T., & Secord, P. F. (1982). Implications for psychology of the new philosophy of science. *American Psychologist*, 38, 399-41
- Mansaray, A., & Ajiboye, J. (1997). Environmental education and Nigerian students knowledge, attitudes, and practices (KAP): Implications for curriculum development. *International Journal of Environmental Education (Ind Information, 16(3))*, in press.
- Mara, D., Lane, J., Scott, B. & Trouba, D. (2010). Sanitation and health. *PLoS Med.*, 7(11), 12.
- Masangwi, S. J., Ferguson, N. S., Grimason, A. M., Morse, T. D., Zawdie, G., & Kazembe, L. N. (2010). *International Journal of Environmental Health Research*, 20(2), 141-158.
- McConville, J. R. (2008). Assessing sustainable approaches to sanitation planning and implementation in West Africa. Land and Water Resources Engineering, (*Licentiate Thesis*), Royal Institute of Technology (KTH) SE - 100 44 Stockholm, Sweden.
- McFarlane, C. (2008). Sanitation in Mumbai's informal settlements: State slum and infrastructure. Environment and infrastructure. *Environment and Planning*, 40(1), 88- 107.
- McGranahan, G. Pedro, J. Songsore, J. Surjadi, C. and Marianne, K. (2001). *The Citizens at Risk: From Urban Sanitation to Sustainable Cities*. London: Earthscan.
- McLeroy, K. R., Bibeau, D., Sleekier, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education Q*, 15(4), 351-377.
- Medina, M. (2000). Globalization, evelopment, and municipal Solid Waste management in third world Cities. London and New York: Routledge.
- Mehta, M., & Knapp, A. (2004). The challenge of financing sanitation for meeting the millennium development goals. Norwegian Ministry of Environment, for the 12th session of the United Nations Commission on Sustainable Development

- (CSD-12). New York, April 14-30, 2004. From www.wsp.org/sites/wsp.org/files/publications/af_finsan_mdg.pdf
- Mensah, A & Larbi, E. (2005). *Solid waste disposal in Ghana*. Well Fact sheet-Regional Annex.
- Meyers, G. D, Glen McLeod., & Anbarci, M. A. (2006). *An international waste convention: measures for achieving sustainable development*. Accessed on 24th April, 2013.
- Miles, M. B. & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks: Sage Publications.
- Millennium Development Goal Report. (2013). Water and Sanitation Program. Retrieved from www.un.org/millenniumgoals/pdf/report-2013/mdg-report-2013-english.pdf
- Minghua, Z., Xiumin, F., Rovetta, A., Qichang, H., Vicentini, F., Binkeri, L., Giusti, A., & Yi, L, (2009). Municipal waste management in Pudong New Area, China. *Waste Management*, 29(3), 1227-1233.
- Ministry of Local Government and Rural Development (MLGRD). (2010). The Ghana Compact Sanitation and water for all (SWA): a global framework for action. Retrieved from www.purc.com.gh/purc/sites/default/files/GhanaCompact.pdf
- Ministry of Local Government and Rural Development (MLGRD). (2011). *Water sanitation and hygiene (WASH) behaviour change communication (BCC) strategy for urban sub sector, Ghana*. Retrieved from WASH Ghana website: www.washghana.net
- Ministry of Local Government and Rural Development Environmental Health and Sanitation Directorate. (2010). National Environmental Sanitation Strategy and Action Plan (NESSAP). Retrieved from http://wcghana.com/reports/national_environmental_sanitation_strategy_and
- Nwana, H. (1990). Intelligent tutoring systems: an overview. *Artificial Intelligence Review*, 4(4), 251–277. [action_plan.pdf](http://www.action_plan.pdf)
- MLGRD (2002). Ghana Landfill Guidelines: Best Practice Environmental Guidelines, Mosse, D. (2001). “People’s Knowledge’, Participation and Patronage: Operations and Representations in Rural Development”, USA, New York: Oxford University Press.
- MLGRD (Ministry of Local Government and Rural Development. (1999). National Environmental Sanitation Policy. Ministry of Local Government and Rural Development. Accra.

- Momoh, J. J. & Oladebeye, D. H. 2010. Assessment of Awareness, Attitude and Willingness of People to Participate in Household Solid Waste Recycling Programme in Ado-Ekiti, Nigeria.
- Mosse, D. (2001). *People's knowledge, participation and patronage: Operations and representations in rural development*. New York: Oxford University Press.
- Mosse, D. (2001). *People's knowledge' participation and patronage: Operations and representations in rural development*. New York: Oxford University Press.
- Mulama, J. (2008). *Development Africa: Sanitation – this is the way we live*. Amsterdam: London Press.
- Murray, A., & Drechsel, P. (2012). Why do some wastewater facilities work when the majority Fail? Case study from the sanitation sector in Ghana. *Waterlines*, 30(2), 135-149.
- Murray, C. J. L. & Lopez, A. D., (1996). Evidenced based health policy - lessons from the global burden of disease study. *Science*, 274, 740-74
- Murray, C. J., & Lopez, A. D. (1996). *The global burden of disease*. Geneva: WHO, Harvard School of Public Health, World Bank.
- Mwanza, D. D. (2001). Water and sanitation services to the urban Poor. People and system for water and papers No. 7, University of Science and Technology, Kumasi and University of Amsterdam, Amsterdam.
- Myers, M. D. (2008). A Disaster for everyone to see: An interpretive analysis of a failed IS project. *Information and Management*, 45(3), 153 -163.
- Myers, S. S. & Patz, J. (2009). Emerging threats to human health from global environmental change. *Annual Review of Environment & Resources*, 34, 223-252. <https://doi.org/10.1146/annurev.enviro.033108.102650>
- Nandha, B., & Krishnamoorthy, K. (2007). School based health education campaign – a potential tool for social mobilization to promote use of DEC - fortified salt towards elimination of lymphatic filariasis. *Health and Education Research*, 22(4), 539-546.
- National Environmental Sanitation Strategy and Action Plan-NESSAP. (2010).
- Neale, P., Thapa, S. & Boyce, C. (2006). Preparing a case study: A guide for designing a case study for evaluation input. *Pathfinder International Tool Series Monitoring and Evaluation*. Retrieved November 23, 2014 from www.2pathfinder.org/site/DocServer/ni_e_tool_series_case_studv.pdf?docID=6

- Neill, J. (2006). Analysis of professional literature class 6: Qualitative Research. Retrieved from <http://wilderdom.com/OECourses/PROFLIT/Class6Qualitativel.htm>
- Neuman, W. L. (2007). *Basics of social research: Qualitative and quantitative approaches* (2nd ed.). New York: Pearson Educational, Inc.
- Nichter, M. (2008). Global Health: Why cultural perceptions, social representations, and biopolitics matter. University of Arizona Press; Tuscon.
- Noye-Nortey, H. (2007). Environment sanitation, clean water and public health. *Journal of Pediatric Allergy and Immunology*, 21(6), 927-934.
- Nunoo, D., Osman, K. M. & Nanedo, N. A. (2009). Participatory hygiene and sanitation transformation (PHAST): A methodology for sustainable hygiene and sanitation behaviour change with experience from Bawku West District, Ghana. West Africa Regional Symposium, Accra, Ghana 10-12 November, 2009.
- Nwana, H. (1990). Intelligent tutoring systems: an overview. *Artificial Intelligence Review*, 4(4), 251-277.
- O'Connor, R., Bord, R., Yarnal, B., & Wiefek, N. (2002). Who wants to reduce greenhouse of family businesses in the rural tourism and hospitality sectors. *Journal of Pediatric Allergy and Immunology*, 5(2), 13-20.
- O'Connor, R., Bord, R., Yarnal, B., Wiefek, N. (2002). Who Wants to Reduce Greenhouse of Family Businesses in the Rural Tourism and Hospitality Sectors. *Journal of Pediatric Allergy and Immunology*, 21(6), 927-934
- Oduro-Mensah, D. (1992). Environmental education and awareness creation through adult education- *Suggestions from Ghana' In Adult Education and Development Journal*, 39, 251-250
- Ogawa, H. (2005). *Sustainable solid waste management in developing countries*. Proceedings of the second High-level Meeting on Health and Environment in ASEAN and East Asian Countries, Bangkok, 12-13th December, 2005
- Ogawa, H. (2005). *Sustainable solid waste management in developing countries*. Proceedings of the second High-level Meeting on Health and Environment in ASEAN and East Asian Countries, Bangkok, 12-13th December, 2005
- Onibokun, A. G. (1999). Managing the monster: urban waste and governance in Africa. Retrieved from <http://www.book.google.co.in/books7hl>
- Ortegren, K. (2004). A summary of the theory behind the LFA method. *The Logical*

- Owusu, E. S., & Roojen, D. V. (2008). Sanitation challenges for a new municipal assembly in the Greater Accra Region, Ghana. Delft, The Netherlands.
- Parker, F. A., Person, B., Quick, R. E., Vindigni, S. M, Jhung, M, Bowen, A. & Riley, P. L. (2012). Systematic review of behaviour change research on point-of-use water treatment interventions in countries categorized as low-to medium-development on the human development index. *Soc. Sci. Med.*, 75,(4), 622-633.
- Patanayak, S. K., Poulos, C., Yang, J., & Patil, S. (2009). How valuable are environmental health interventions? Evaluation of water and sanitation programmes in India. *Bulletin of the World Health Organization*, 88, 535-542. doi: 10.2471/BLT.09.066050
- Pelto, J. P., & G. H. Pelto. (1997). Studying knowledge, culture, and behavior in applied medical anthropology. *Medical Anthropology Quarterly*, 11(2), 147-163.
- Petty, R. E., & Cacioppo. J. T. (1981). Issue involvement as a moderator of the effects on attitude of advertising content and context. *Advances in Consumer Research*, 8, 20-24.
- Pierre, J. (2000). *Debating governance: Authority, steering and democracy*. Oxford: Oxford University Press.
- Pinfold, J. V. (1999). Analysis of different communication channels for promoting hygiene behaviour. *Health Education Research*, 14(5), 629 - 639.
- Plotnikoff, R., Wright, M., Karunamuni, N. (2004). *Knowledge, attitudes and practice*. New Jersey: Prentice-Hall, Upper Saddle River.
- Postma, L., Getkate, R., & Van Wijk, C. (2004). Life skills-based hygiene education: A guidance document on concepts, development and experiences with life skills based hygiene education in school sanitation & Hygiene Education Programmes. *IRC International Water and Sanitation Centre Technical Paper Series*, 42, 144.
- Rainey, R. C., Harding, A. K. (2005). Acceptability of solar disinfection of drinking water treatment in Kathmandu Valley, Nepal. *International Journal of Environment and Health Research*, 15,(5), 361-372.
- Ram, J. G. D., Reddy, V., Rao, K. P., & Reddy, G. M. (2004). Control of laves phase in Inconel 718 GTA welds with current pulsing. *Science and Technology of Welding and Joining*, 9(5), 390-398.
- Reinhardt, P., and Gordon, J. (1991). *Infectious and medical waste management*. Chelsea, MN: Lewis Publishers.

- Rheingans, R., Dreibelbis, R. & Freeman, C., (2006). Beyond the millennium development goals: Public health challenge in water and sanitation. *Global Public Health: an International Journal for Research, Policy and Practice*, 15(1), 31-48.
- Rheinlander, T., Samuelsen, H., Dalsgaard, A., & Konradsen, F. (2010). Hygiene and sanitation among ethnic minorities in Northern Vietnam: Does government promotion match community priorities? *Soc. Sci. Med.*, 71(5), 994-1001.
- Ridderstolpe, P. (2000). Comparing consequences analysis - a practical method to find the right solution for wastewater treatment. Retrieved from www.ieesch/EcoEngDOIR4.html
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.
- Samanta, B. B., & Van Wijk, C. A. (1998). Criteria for successful sanitation programmes in low income countries. *Health Policy Plan*, 13, 78-86.
- Samson, K. (2011). Complementary roles? NGO-government relations for community-based sanitation in South Asia. *Public Administration and Development*, 31(4), 282- 293.
- Sanni, M. M. (2015). An examination of environmental sanitation and its health hazards in the polytechnic, Ibadan. *Academic Journal of Interdisciplinary studies*, 4,(1), 47-56.
- Sarantakos, R. (1998). *Research methods in schools*. Boston: FORDANNA Academic, Publisher.
- Shafiul, A. A. & Mansoor, A. (2003). Partnerships for solid waste management in developing Countries. *Journal of Health Education*, 3(Special issue), 180-193.
- Sharma, S. (2015, October 1). *15 diseases India can stamp out by improving sanitation*. Hindu Times. Retrieved October 10, 2016 from m.hindustaintimes.com/india/15-diseasesindiacanstampoutbyimprovingsanitationAXFE29Xo13Sbtpqrd20a90.html.
- Shatri, S., Raval, P. M. & Mapuskar (2010). Review of sustainable wastewater treatment: options for urban sanitation facilities in developing countries, case study: Upper Bhima, India. *Journal of Applied Science in Environmental Sanitation*, (01/2010).
- Siegel, M. (1993). Garbage and other pollution—How do we live with all the trash? *Information Plus*. Detroit

- Snel, M. (2004). *The worth of school sanitation and hygiene education (SSHE) Case studies*. Retrieved from www.irc.nl/content/download/11311/166737/file/SSHE_cases_draft.pdf.
- Songco, J. A. (2002). Do rural infrastructure benefit the poor?: evaluating linkages: a global view, a focus on Vietnam. Retrieved from <https://books.google.co.in/books?hl=en&lr=&feid=MSgl6gJYnlAC&feoi=fhd&pg=PP9&ots=xXslUhDw8Y&sig=qZ4aYAhIvUVLmN5jLOu6JsNE4ps#v=onepage&q&f=fals> Health, 10(12), 6939-6954.
- Stake, R. E. (1995). *The art of case study research*. London: Sage Publications.
- Stokes, J., Noren, J., and Shindell S. (2000). Definition of terms and concepts applicable to clinical preventive medicine. *Journal of community Health*, 8(1), 33-41
- Strauss, A. & Corbin, J. (1990). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Newbury Park: Sage.
- Stretcher, V., & Rosenstock I. M. (1997). The health belief model. In Glanz, K., Lewis F.M., & Rimer, B. K. (Eds.). *Health behavior and health education: theory, and research practice*. San Francisco: Jossey-Bass.
- Sustainable Sanitation Solutions (2008). *Towards more sustainable sanitation solutions*. SuSanA Vision Document. Author. Retrieved from www.susana.org/en/resources/library/details/267
- Sweat, M., Kerrigan, D., Moreno, L., Rosario, S., Gomez, B., Jerez, H., Weiss, E., & Barrington, C. (2006). Cost-effectiveness of environmental-structural communication interventions for HIV prevention in the female sex industry in the Dominican Republic. *Journal of Health Communication*, 11(2), 123-142.
- Taylor, K., Parkinson, J. & Colin J. (2003). *Urban sanitation; a guide to strategic planning*. Retrieved from <http://www.tocs.ulb.tu-darmstadt.de/204204402.pdf>
- The World Bank (WB), (2005). World Bank "State of the Art" *Hygiene and Sanitation Promotion Component Design of Large-Scale Rural Water Supply and Sanitation Programs*. Retrieved from <http://www.siteresources.worldbank.org>
- Thor, A. S. (2005). *Breaking the sanitation barriers: WHO Guidelines for excreta use as a baseline for environmental health*. Ecosan Conference, Durban, South Africa from 23-26 May, 2005.
- Tilley, E., Ulrich, L., Lüthi, C., Raymond, P. H. & Zurbrugg, C. (2014). *Compendium of sanitation systems and technologies*. (2nd ed.). Duebendorf, Switzerland:

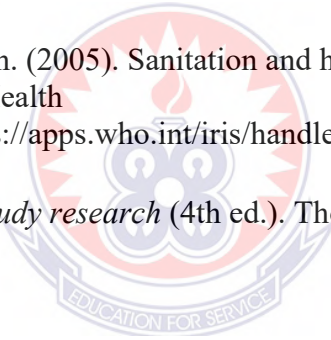
Swiss Federal Institute of Aquatic Science and Technology (Eawag). Retrieved from www.eawag.ch/en/department/sandec/publikationen/compendium/

- Tratschin, R. (2011). Water, sanitation and dignity. Sustainable sanitation and water management. Retrieved from <http://www.sswm.info/content/watersanitation-and-dignity>
- Tsiboe, M. (2004). *An analysis of solid waste management in Accra, Ghana*. Masters Thesis, Roskilde University. pp 13-14
- Tsiboe, M. (2004). *An analysis of solid waste management in Accra, Ghana*. (Master Thesis), Roskilde University.
- Tsinda, A., Abbott, P., Pedley, S., Charles A., Adogo, J., Okurut, K., & Cheneweth, J. (2013). Challenges to achieving sustainable sanitation in informal settlements of Kigali, Rwanda. *International Journal of Environmental Research and Public Health*, 10,(12), 6939-6954.
- UNDP (2006). *Beyond scarcity: Power, poverty and the global water crisis*. New York : United Nation Development Programme.
- UNDP. (2013). Millennium development goal report 2013. Retrieved from www.undp.org/content/undp/home/librarypage/mdg/the-millennium-developmentgoals-report-2013.html
- UNEP, United Nations Environmental Programme (1994). Environmental Data Report 1993/1994.
- UNESCAP. (2000). *Sustainable Asia- Waste*. Retrieved March 17, 2012, from unescap.org: www.unescap.org/iesd/environment/soe/2000/documentsCHOS.PDF
- UN-Habitat. 2007. Framework for global water operators partnerships alliance. *Water, Waste Management & Research*, 24,(6), 505-513.
- UN-Habitat. United Nations Human Settlement Program, *the Challenge of Slum-Global Report on human Settlement*. Nairobi, Kenya, 2003.
- UNICEF. (2000). Sanitation for all: Promoting dignity and human rights. Retrieved from <http://www.unicef.org/wash/files/sanall.pdf>
- UNICEF. (2000). Sanitation for all: Promoting dignity and human rights. Retrieved from <http://www.unicef.org/wash/files/sanall.pdf>
- UNICEF. (2006). *Progress for children 5*. New York: UNICEF. Retrieved from www.unicef.org/progressforchildren/2006n4/files/PFC4_EN_8Xl1.pdf

- UNICEF/IRC. (2006). School sanitation and hygiene education: Results from the assessment of a 6-country pilot project. Retrieved from <http://www.schoolsanitation.org/Resources/Readings/UNICEF6Country.pdf>
- UNICEF/WHO, (2006). *Joint monitoring program on drinking water and sanitation*. New York: UNICEF/WHO.
- UNICEF/WHO. (2008). *Progress on drinking water and sanitation: Special focus on sanitation*. New York: UNICEF/WHO. Retrieved from <http://www.unicef.org>
- UNICEF/WHO. (2009). Diarrhoea: Why children are still dying and what can be done. Retrieved from <http://www.who.int/maternalchildadolescent/documents/9789241598415/en>
- United Nations Environmental Programme (UNEP). (2005). Annual Report 2005. Retrieved from <http://www.unep>.
- WASH Ghana. (2011). BCC Strategy for the Urban WASH Sub Sector, <http://www.washghana.net>
- Water Aid Uganda. (2013). *Status of water, sanitation and hygiene in primary schools*. Retrieved from www.wateraid.org/uganda, accessed 12 September 2016.
- Water Aid. (2011). The sanitation problem: what can and should the health sector do? Water Aid Report. Retrieved from www.wateraid.org/~media/.../sanitation-problem-healthsector.pdf
- Water and Sanitation Program (WSP). (2008). *Can Africa afford to miss the sanitation MDG target?* Washington: Water and sanitation program. Retrieved from <http://www.wsp.org/librarv>
- Water and Sanitation Program (WSP). (2012). *Achieving and sustaining open defecation free communities: Learning from East Java*. Retrieved from <http://www.wsp.org/library>
- Water and Sanitation Programme. (2005). *National hygiene and sanitation strategy*. <http://www.wsp.org/librarv>
- Water Supply & Sanitation Collaborative Council (WSSCC). (2005). *Sanitation and hygiene promotion programming guidance*. Retrieved from http://www.who.int/water_sanitation_health/hygiene/sanhygpromo.pdf
- Water Supply & Sanitation Collaborative Council (WSSCC). (2010). *Global forum on sanitation and hygiene*. Retrieved from http://www.wsscc-globalforum.watgovernnce.org/documents/WWW_PDF/2010/tuesday/k12/samn_cairncross.Pdf

- Weigel, R. H., & Newman, L. S. (1976). Increasing attitude-behavior correspondence by broadening the scope of the behavioral measure. *Journal of Personality and Social Psychology*, 33,(6), 793–802.
- WHO & UNICEF. (2004) Meeting the MDG Water and Sanitation target: The urban and rural challenge of the decade. World Health Organization, Geneva & United Nation Children Fund, New York.
- WHO (1997). Primary school physical environment and health. WHO Global School Health Initiative, WHO Information Services on School Health, Document Two, Geneva.
- WHO (2013). The world health report 2013: Research for universal health coverage. Retrieved from <http://www.who.int/whr/en/>
- WHO (World Health Organisation). (2004c). *Water, sanitation and hygiene links to health, facts and figures*. WHO, Geneva. Available at http://www.who.int/water_health/publications/facts_2004/en/index.html
- WHO Fact Sheet. (2015). *Sanitation*. Retrieved from <http://www.who.int/mediacentre/factsheets/fs/en>
- WHO Water Sanitation Health. (1998). *Sanitation Promotion*. Retrieved from http://www.who.int/water_sanitation_health/hygiene/envsan/sanprom/en
- WHO (1999). Sanitation Promotion. WSSCC Working Group on Promotion of Sanitation. Retrieved from www.wsscc.org/.../files/publications/who_sanitation_promotion_1998
- WHO (2006). Meeting the MDG water and sanitation target: the urban and rural challenge of the decade. *WHO Library Cataloguing-in-Publication Data*. Retrieved from www.who.int/water_sanitation_health/monitoring/impfinal.pdf
- WHO (2013). The world health report 2013: research for universal health coverage. Retrieved from <http://www.who.int/whr/en/> WHO, (2015). Progress on sanitation and drinking water. Retrieved from http://www.who.int/water_sanitation_health/publications/9789241563956/en/
- WHO (2015). Progress on sanitation and drinking water. Retrieved from http://www.who.int/water_sanitation_health/publications/9789241563956/en/
- WHO/UNICEF. (2013). *Joint monitoring programme for water supply and sanitation: Progress on drinking water and sanitation*. Retrieved from http://www.wssinfo.org/documents/?tx_displaycontroller%5Byear%5D=2013&tx_displaycontroller%5Bsearch_word%5D=&tx_displaycontroller%5Btype%5D=

- Wood, S., Foster, J., Kols, A. (2012). Understanding why women adopt and sustain home water treatment: Insights from the Malawi antenatal care program. *Soc. Sci. Med.* 75.
- World Bank. (2005). The World Bank Annual Report 2005: Year in review, volume 1. Washington D. C World Bank.
<http://openknowledge.worldbank.org/handle/10986/7537> Licence : CCBY 3.0 IGO.”
- World Health Organisation (WHO). (2010). The world health report-Health Systems Financing: The path to universal coverage. Retrieved from [http:// www. Who. int /entity/ whr 10 _en](http://www.who.int/entity/whr/10_en).
- World Health Organization & UNICEF. (2012). *Progress on drinking water and sanitation: Update*. United States: WHO/UNICEF joint monitoring programme for water supply and sanitation.
- World Health Organization. (2007). *The World Health Report 2007. A safer future*. Retrieved from: [http://who.int/whr/2007/ en/index.htm](http://who.int/whr/2007/en/index.htm). Accessed on 25 August, 2016.
- World Health Organization. (2005). Sanitation and hygiene promotion : programming guidance. World Health Organization. <https://apps.who.int/iris/handle/10665/43189>
- Yin, R. K. (2008). *Case study research* (4th ed.). Thousand Oaks, CA: Sage.



APPENDICES

APPENDIX A

Letter of Introduction



UNIVERSITY OF EDUCATION, WINNEBA

FACULTY OF SCIENCE EDUCATION
DEPARTMENT OF PHYSICS EDUCATION

P. O. Box 25, Winneba, Ghana

physicseducation@uew.edu.gh

+233 (020) 2641079

DSE/M.1/VOL.2/

September 07, 2020

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

INTRODUCTORY LETTER

The bearer of this letter, *Sampson Adjei Kankam* with Index Number *200029532*, is an M.Phil. (Top-UP) student of the Department of Science Education in the above University.

He is conducting a research on “*Ensuring quality of environmental standards on some selected Colleges of Education in Ashanti Region of Ghana*” for his studies. We would be grateful if you could assist him collect data for his research.

Counting on your usual co-operation.

Thank you.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Antwi'.

PROF. VICTOR ANTWI, PhD
Head of Department

HEAD
DEPARTMENT OF PHYSICS EDUCATION
UNIVERSITY OF EDUCATION
WINNEBA



www.uew.edu.gh

APPENDIX B

Questionnaire for Students

UNIVERSITY OF EDUCATION- WINNEBA
FACULTY OF SCIENCE EDUCATION
DEPARTMENT OF SCIENCE EDUCATION
SCHOOL OF GRADUATE STUDIES

Questionnaire for Students of Offinso College of Education on Ensuring Environmental Sanitation Quality Standards and its Implication on Students' Health

This questionnaire has been designed to solicit information for a research studies in Master of Philosophy (M.Phil), on the topic; “Ensuring environmental sanitation quality standards and its implication on student’s health; a case study of Offinso College of Education in Ashanti Region of Ghana, at the Department of Science Education at UEW. You have been humbly selected as one of the respondents to help in the above study. The information you provide will help to make a positive impact on improvement of health conditions in the college. Be assured of maximum confidentiality on the information you shall provide.

Instruction:

Please tick (√) where applicable and provide responses where appropriate.

Part 1: Mean ratings of the responses of respondents on the causes of poor sanitation practices in Offinso College of Education.

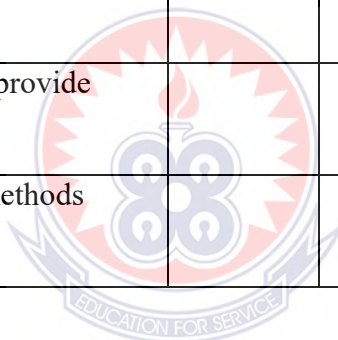
The following statements or expressions in this table are in respect to students’ opinion on the causes of poor sanitation practices in Offinso College of Education.

The questions are the Likert scale 1 for Strongly Agree (SA), 2 for Agree (A), 3 for Disagree (D) and 4 for Strongly Disagree (SD). Please, *tick* (√) where applicable your agreement or otherwise to the statement.

Research question 1

What are the causes of poor sanitation practices in Offinso College of Education in Ashanti region of Ghana?

No.	Mean ratings of the responses of respondents on the causes of poor sanitation practices in Offinso college of Education.	Strongly Agree	Agree	Disagree	Strongly Disagree
1.	Inadequate Hygiene education.				
2.	Lack of Health facilities.				
3.	Insufficient water supply.				
4.	Inadequate toilet/latrine facilities.				
5.	Lack of dustbins for disposing wastes like chocolates and biscuits wraps.				
6.	Throwing rubbish anywhere in the compound.				
7.	Inadequate Funds to provide sanitation				
8.	Poor waste storage methods adopted.				



Part 2: Mean ratings of the Respondents on the effects of poor sanitation practices on students' health in Offinso College of Education.

These expressions are tabled to solicit your ideas as what constitutes the effects of poor sanitation practices on students' health in Offinso College of Education. The items are on the Likert scale 1, 2, 3, and 4 representing Strongly agree, Agree, Disagree, and Strongly disagree respectively. Please *tick* (√) your agreement or disagreement where applicable.

Research question 2:

What are the effects of poor sanitation practices on students' health in Offinso College of Education?

No.	Mean ratings of the Respondents on the effects of poor sanitation practices on students' health in Offinso College of Education.	Strongly agree	Agree	Disagree	Strongly disagree
1.	Poor sanitation can cause diarrhoea for students.				
2.	Poor sanitation can cause typhoid for students.				
3.	Poor sanitation can cause cholera for students				
4.	Poor sanitation can lead to stunted growth in students				
5.	Poor sanitation can lead to malnutrition				
6.	Poor sanitation can lead to malaria				
7.	In extreme cases, poor sanitation can lead to student mortality.				

Part 3: Mean ratings of the respondents on the ways the school management has contributed in providing facilities that will enhance sanitation practices in Offinso College of Education.

The statement in the table below is to find out students' opinion on the way the school management has contributed in providing facilities that will enhance sanitation practices in Offinso College of Education. Please, *tick* (✓) the appropriate place which corresponds to the statements made.

Research question 3

In what ways have the school management contributed in providing facilities that will enhance sanitation practices in Offinso.

No.	Mean ratings of the respondents on the ways the school management has contributed in providing facilities that will enhance sanitation practices in Offinso College of Education.	Strongly agree	Agree	Disagree	Strongly disagree
1.	Provision of hygiene education.				
2.	Employing cleaners to keep the environment clean.				
3.	Provision of dustbins/ rubbish bins all over the school.				
4.	Proper maintenance of health facilities.				
5.	Adequate supply of clean water.				
6.	Encouraging individuals to engage in environmental sanitation research.				

PART 4: Mean Responses of the Respondents on Strategies that could be employed to Improve Sanitation in Offinso College of Education.

The following statements are made to gather information on the strategies that could be employed to improve sanitation in Offinso College of Education Please *tick* (✓) where applicable your agreement or disagreement with the statement.

Research question 4**What are the strategies that could be employed to improve sanitation in Offinso****College of Education?**

No.	Mean Responses of the Respondents on Strategies that could be employed to Improve Sanitation in Offinso College of Education.	Strongly agree	agree	Disagree	Strongly Disagree
1.	Need for environmental Sanitation Research.				
2.	The need for students to undertake hygiene education.				
3.	More health workers should be trained to include sanitation practices counselling into their consultation with patients.				
4.	More toilets should be put in place in strategic locations to complement the existing one to reduce incessant urination and faecal deposits.				
5.	Impromptu inspection around the campus from time to time.				
6.	Management should source for more funds from local and international level which would be used for providing sanitation facilities.				
7.	Waste disposal vehicles should be procured so that waste can safely be removed.				
8.	Partnership should be establish with private agency to help convert waste to wealth through waste reduction, reused and recycling.				
9.	Regular seminars should be organized on the need for sanitation				