UNIVERSITY OF CAPE COAST

AVAILABILITY AND STATE OF SCHOOL INFRASTRUCTURE IN RURAL SENIOR HIGH SCHOOLS IN THE ASSIN NORTH MUNICIPALITY: PERCEPTIONS OF USERS

JOYCE ODUAA AMOAH

2018

UNIVERSITY OF CAPE COAST

AVAILABILITY AND STATE OF SCHOOL INFRASTRUCTURE IN RURAL SENIOR HIGH SCHOOLS IN THE ASSIN NORTH MUNICIPALITY: PERCEPTIONS OF USERS

BY

JOYCE ODUAA AMOAH

Thesis submitted to the Institute for Educational Planning and Administration, School of Educational Development and Outreach, College of Education Studies, University of Cape Coast, in partial fulfilment of the requirements for award of Master of Philosophy degree in Educational Administration

APRIL 2018

DECLARATION

Candidate's Declaration

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

Candidate's Signature…… Date……

Name: Joyce Oduaa Amoah

Supervisors' Declaration

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

Principal Supervisor's Signature…… Date……..……

Name: Dr. Hope Pius Nudzor

Co- Supervisor's Signature……. Date……..……

Name: Dr. Janet Koomson

ABSTRACT

The purpose of this study was to investigate the availability and state of infrastructure in rural senior high schools in the Assin North Municipality of the Central Region as perceived by the users of the infrastructure. The descriptive survey design approach was used for the study. A sample of 350 students, 110 teachers and 24 administrators was selected through purposive, stratified, simple random and census sampling procedures. A questionnaire and a semi-structured interview guide were used for the study. Pilot test was done with respondents from Assin Nsuta senior high school which was not part of the sample for the study. The reliability obtained was 0.77. The data obtained from the questionnaire were analysed descriptively according to the research questions of the study. The recorded data were transcribed, coded and presented in themes using thematic analysis according to the research questions. The study found that in most rural senior high schools, the facilities were not adequate, not in a good state and as such need some of renovation which might not have been done in a long time. It was also found that the availability and adequacy of school infrastructure affect the teaching and learning process in senior high schools. Finally, it was found that the presence or otherwise of school facilities affects the general administration of schools. From the findings, it was recommended that the Government respond to the pleas of school administrators in rural areas to provide their schools with the necessary facilities to facilitate teaching and learning.

ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to all who have helped me through my study. My greatest appreciation goes to my supervisors, Dr. Hope Pius Nudzor and Dr. Janet Koomson for their tremendous support, encouragement and guidance throughout the period of writing this thesis.

I also express my gratitude to my husband, Mr. Michael Afriyie. His support throughout the period of writing this thesis was immense. I also thank my mum, Mrs. Veronica Amankrah Brefo and all my family members for all their help.

Further, I am grateful to the heads and teachers of all the three schools for their support during the data collection period in the study. I also express my gratitude to Mr. Sylvester Tenkorang for his support throughout the entire period of writing the thesis. Finally, I thank all friends and colleagues for their encouragement and support in writing this thesis.

DEDICATION

To my husband, Mr. Michael Afriyie and my son, Philemon Agyei Afriyie.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

Background to the Study

Education has been seen by Akhihiero (2011) as a dynamic instrument of change which is not only the key to maintaining freedom in our society but also a key to continued growth of freedom throughout the world. There is therefore a presumed compulsory need for every individual to be educated. The highly positive nature of the relationship between productivity and the level of education suggests that educated people might be more productive than the uneducated (Jones, 2001). The importance of education can therefore not be overstated.

The school as an educational institution is basically established for instruction and learning. As a result, educational goals, diverse personnel, curriculum, knowledge, physical facilities, materials, students and finance are all inputs into the school system with the aim of producing well-equipped outputs. The output of education can be measured in terms of the performance of students. The performance can be influenced by the availability of school facilities such as laboratories, libraries, laboratory equipment, and instructional materials such as textbooks (Eshiwani, 1993). It has therefore been indicated by Ayeni and Adelabu (2012) that the development of education depends on several factors especially the infrastructure resources available to a school. This infrastructure, according to Ayeni and Adelabu include the site, buildings, furniture and equipment in a learning environment.

The infrastructure in a school environment has also been viewed by Ikgbusi and Iheanacho (2016) as including all the buildings and equipment in schools that aid teaching and learning. Thus, school facilities are the material resources that facilitate effective teaching and learning in schools (Akhihiero, 2011). School infrastructure or facilities therefore have three main users namely: the school administration, teachers and students. Peretomode (2003) has revealed that administration is the component of management concerned with facilitating accomplishment of the objectives of an organization. Peretomode argued that facilitating accomplishment of the objectives of an organization can be done through the systematic management of constraints and careful utilization of the available limited resources like human, material, finance and others. Specifically, school administration in the view of Okeke (1990) is responsible for the provision and maintenance of the necessary manpower to those who teach students with a view to bringing about the desired change in the behaviour of students.

Further, Adesina (1990) has opined that the provision of physical facilities is one of the greatest services to be provided to students. He argued that the availability of physical facilities in schools promote the quality of teaching and learning. In support, Hanson (1989) stated that teachers are distracted and demoralised when the physical conditions and facilities in their schools are inadequate and poorly maintained. This, in the view of Hanson is because teachers and students in such schools may be looked down upon by those in schools with better conditions, and this will definitely affect the teaching and learning process. In essence, school administrators, teachers and students are the main users of school infrastructure. It could therefore be seen

that all these users of infrastructure are invariably affected by the infrastructure in the schools. It is equally important to add that how these users perceive the state of the infrastructure in the schools is important. This is because how the users perceive the state of infrastructure can affect their behaviour in the school and their overall attitude towards their specific duties.

Bernard (2003) described perception as the act of receiving information through the senses (sight, sound, touch and smell). Perception can therefore be seen as an individual's personal theory of reality. It also involves the brain's process of organising and interpreting sensory information to give it meaning (Kern, 2008). Thus, perception can be viewed as the way the brain interprets feelings to make them meaningful. This implies that how the users of infrastructure perceive the infrastructure in their schools to be can affect their overall attitude towards their work in the school.

According to Ashong (2010), rural areas are areas with a level of development that is below the expected standard for a particular country. Thus, in Ghana, less developed areas with low standard of living could be seen as rural areas. Some of the rural areas in the Assin North Municpality include Assin Asempaneye, Assin Atonsu, Assin Awsem, Assin Breku, Assin Brofoyedur and Assin Dansame (Ghana Statistical Service (GSS), 2014).. Rural Senior High Schools are the senior high schools found in the rural areas with most of them established to serve the educational needs of individuals within a particular rural domain. Sometimes, these schools can be serving more than one community. To ensure that the school is effective and efficient in the performance of its functions, the three components of personnel, money and materials must be harmoniously available and managed (Akhihiero,

2011). In the view of Coombs (1968 as cited in Osahon, 2001) any productive system, whatever its aim and technology, requires management and must have leadership and direction, supervision and coordination, constant evaluation and adjustment. According to Akhihiero (2011), until recently, the components of personnel and money were emphasized to the neglect of materials aspect in school management, but efforts are shifting to the material component since no meaningful and positive teaching and learning can take place without school facilities.

Most of the senior high schools in rural areas like Assin Achiano, Assin Akonfudi and Assin Akropong have a lot of challenges with the most pronounced of them being infrastructure (Ashong, 2010). When the administrators and those responsible fail to arrest these situations and problems, the smooth running of the school is affected (Ikgbusi & Iheanacho, 2016). In Ghana, the outcry against schools for poor academic performance has led to several interventions with the exception of interventions related to the inadequacy of infrastructure in schools (Ashong, 2010).

According to a report by a Ghanaian based news website (photius.com), the issue of infrastructure in senior high schools is worse in rural areas as compared to urban areas. This is because urban areas in Ghana have customarily been provided with more amenities and infrastructure than the rural areas. This is a challenge to all the users of infrastructure in senior high schools in the rural areas since the extent to which development takes place in a school affect the overall performance of students and therefore should be of interest to stakeholders (Ashong, 2010). In this same line, Hallak (1990) indicated that facilities or infrastructure in schools are the main factor

contributing to academic achievement in the school system. Hallak therefore claimed that the quality, appropriateness and adequacy of facilities or infrastructure contribute to performance in the school system. The perception of users of infrastructure towards infrastructure is of importance in this study because as already established the perception of users influence the attitude of the users towards the infrastructure in the school, which is a very important element of consideration. This is because, according to Izobo-Martins, Dare-Abel, and Kunle (2014), user attitude, maintenance culture and lack of funds affect the overall condition of infrastructures in schools.

The Assin North Municipality in the Central region of Ghana is among the twenty (20) Metropolitan/Municipal District Assembles (MMDA's) in the Central Region of Ghana out of which Assin South District was created in August 2004 (Ghana Statistical Service (GSS), 2014). Assin North is situated in the northern corner of the Central Region and shares common boundaries with Adansi East in the Ashanti Region, to the North, Upper Denkyira to the North-West, Assin South to the South, Twifo Atti Morkwah to the West and Birim South in the Eastern Region to the East (GSS, 2014). Some of the towns within the Municipality are Assin Foso (the Municipal Capital), Assin Nyankumasi, Assin Akonfudi, Assin Bereku, Assin Praso and Assin Kushea.

The population of Assin North Municipality according to the 2010 Population and Housing Census is 161341 representing 7.3 percent of the central region's total population. Males constitute 49.7 percent and females represent 50.3 percent. Again, a majority of about 63.1 percent of the population reside in rural localities (GSS, 2014). In terms of education, of the population 11 years and above, 80 percent are literate and 20percent are not

literate. Again, of the population aged 3 years and above (64,528) in the municipality, 47.1 percent are schooling 38.2 percent have attended in the past and 17.8 percent have never attended. This implies that education is given a priority in the Municipality. Further, since majority of the Municipality is within rural localities, investigating into the infrastructure of the secondary schools within the municipality is not out of place. It is against this background that this study is conducted.

Statement of the Problem

School infrastructure is an integral component of the learning and teaching process (Khumalo & Mji, 2014). This is because a school's infrastructure enables students and teachers to access a wide range of tools, services and resources to support learning and teaching. The status of infrastructure or physical facilities in senior high schools therefore appears to be of great concern to educators (Akomolafe & Adesua, 2015). Regardless of the apparent importance of infrastructure in schools, it appears that the provision of these infrastructure have declined over the years, probably due to the increase in school enrolment (Akomolafe & Adesua, 2015).

On this basis, Alagbu (2003) opined that a large number of senior high schools suffer an immense deprivation of facilities that aid teaching and learning. According to Ashong (2010), the situation of infrastructural difficulties is worse in rural senior high schools in Ghana because the development of rural senior high schools have not received adequate attention to enable them compete with the well-endowed urban senior high schools due mostly to the inadequacy of infrastructure. This calls for the need to

investigate into the availability and state of infrastructure in rural senior high schools.

In Ghana, studies such as that of Donkor (2009) and Ashong (2010) have all accessed the state of infrastructure as part of the challenges faced by senior high schools and specifically rural senior high schools. These studies have all indicated that infrastructure availability and adequacy is a challenge for most senior high schools.

In the Assin North Municipality, the researcher has observed that the senior high schools do not have well equipped and modern school facilities. This lack of modern school facilities affects students, teachers and the teaching and learning process as a whole. Students do not have the comfort required to study effectively in the absence of modern facilities like science laboratories. Again, teachers have to struggle to be able to teach more practical subjects. Some of the teachers who are posted there even express dislike and disinterest in teaching in the schools. This makes the whole teaching and learning process in the senior high schools in the Municipality difficult. In spite of this, no study has been carried out in the Assin North Municipality to assess the availability and state of infrastructure in rural senior high schools in the municipality. This has necessitated investigating into the perception of users about the availability and state of infrastructure in rural senior high schools in the Assin North Municipality to help make policy recommendations.

Purpose of the Study

The main purpose of the study was to investigate the availability and state of infrastructure in rural senior high schools in the Assin North Municipality of the Central Region as perceived by the users of the infrastructure.

Research Questions

In light of the purpose of the study, the following research questions have been formulated to guide the study:

1. What is the level of availability of infrastructures in rural senior high schools in the Assin North Municipality?
2. What is the current state of infrastructure available in rural senior high schools in the Assin North Municipality?
3. How does the available infrastructure in rural senior high schools in the Assin North Municipality support teaching and learning?
4. In what ways do the availability and/or unavailability of infrastructure affect the general administration of rural senior high schools in the Assin North Municipality?

Significance of the Study

The findings of this study are anticipated to be a source of information for Senior High School administrators in the rural areas particularly about the state of infrastructure in schools. This may help the administrators develop strategies to overcome challenges related to the infrastructure in schools and thereby help to enhance the performance of the schools.

To the Ghana Education Service and the Ministry of Education, the results of this study may help them plan and put in measures to overcome the

challenges posed by the lack of infrastructure in senior high schools. The findings of the study may also add to the existing knowledge on the state of infrastructure and how users of infrastructure in senior high schools are affected.

Overall, stakeholders in the education sector such as policy makers, government functionaries, administrators and Parent Teacher Associations may see the need for the provision of school infrastructure to benefit all users of infrastructure in schools.

For research communication, dissemination and user-engagement purposes, copies of the final report of this study would be sent to the schools where the study was carried out and also to the Assin North Municipal Education Office. The Municipal Education Office can then forward the report to the Ministry of Education and Ghana Education Service. The report is anticipated to help achieve all the significant targets addressed in this section. Copies of the final report of this study would also be kept at the University of Cape Coast Main Library to ensure that students and other researchers willing to carry out a study in this field get access to the report to serve as a literature to support their studies.

Delimitation of the Study

The study was delimited geographically to three rural senior high schools within the Assin North Municipality of the Central Region. Again, the study was delimited in its scope, thus, the availability and state of infrastructure and how it affects teaching and learning would be assessed. The study would also involve three main users of school infrastructure. They are the school administrators, teachers and students.

Limitations

The main limitation faced in the study had to do with access to the administrators of the schools for the interview. Because of the schedules of the administrators, it took a while to be able to get them for the interview. This delayed the data collection timeline. However, in the end, all the administrators were interviewed. As a result, this limitation did not affect the findings of the study.

Definition of Terms

The key terms as used in the study are defined below:

Perception: In this study, perception refers to how participants of the study view the state of infrastructure in the senior high schools.

Infrastructure: Infrastructure is used as an all-inclusive term in the study to encompass all the facilities and teaching aids which facilitate teaching and learning in schools. It is used interchangeably with facilities in this study. Infrastructure in this study therefore covers the physical facilities such as dormitories, classrooms and laboratories as well as teaching and learning materials like computers.

Users of Infrastructure: The term users of infrastructure is used in this study to refer to the school administrators, teachers and students who are all affected by the infrastructure in schools.

Rural Areas: Rural areas are the areas that are less developed and have a low standard of living with low population density. In this study, rural areas include areas such as Assin Asempaneye, Assin Atonsu, Assin Awsem, Assin Breku, Assin Brofoyedur and Assin Dansame.

Rural SHS: In this study, rural senior high schools are the schools found within rural areas. In the current study, three rural senior high schools are found within the Assin North Municipality.

Organisation of Study

In order to facilitate easy reading and understanding, the study was organised in five chapters. The First chapter deals with the introduction of the study. It includes the background to the study, statement of the problems, purpose of the study, research questions and the significance of the study. It also deals with the delimitation of the study, limitations of the study, and definition of terms.

The Second chapter reviews literature related to the study. It covers the theoretical and conceptual frameworks as well as the review of related empirical studies. Chapter Three of the study focuses on the methodology for the study. This covers the research design, the study area, the population, the sampling procedures, the instrument used, data collection procedure and the data processing and analysis.

The Fourth chapter presents and discusses the results of the study. The data collected is analysed, interpreted and discussed in answer to the research questions of the study. The Fifth and final chapter of the study presents the summary, conclusions and recommendations of the study. It also presents suggestions for further research.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter reviews literature related to the study. The review is done in three sections. This includes the theoretical framework, conceptual framework and the review of empirical studies on infrastructure in rural senior high schools. Doing the review under three sections enabled the researcher to accurately cover all the domains of literature related to the study.

Theoretical Framework

This section reviewed some of the theories that underpin or drive the current study. Some of the theories reviewed include the Education Production Function theory and the Theory of Growth. Even though both theories are described in the study, the education production function theory will be the main theoretical framework for the study. This is because the education production function theory directly views infrastructure in schools as a fundamental part of the school system which can have an impact on the overall output of administrators, teachers and students who are the main users of school infrastructure. Since the current study seeks to find out the availability and state of school infrastructure as perceived by the users of infrastructure (administrators, teachers and students), the Education Production Function theory is deemed suitable for the study.

Education Production Function theory

The education production function theory represents mathematically the process by which a school transforms inputs (Stephen & Eileen, 1990 cited in Onyara, 2013). An education production function is an application of the economic concept of a production function to the field of education. A simple production model lies behind much of the analysis in the economics of education. According to Onyara (2013), the education production function theory considers both inputs and outputs of education in explaining the education system. The common inputs recognised include school resources, teacher quality, and family attributes, and the outcome is student achievement. The outputs are however measured in terms of subsequent labour market success, school enrollment, graduation rates, and academic performance.

In the view of Onyara (2013), a large number of successive studies have produced inconsistent results about the impact of school resources on student performance. Because outcomes cannot just be changed and as such much attention has been directed at inputs – particularly those perceived to be relevant for policy such as school resources (Onyara, 2013). In relating this theory to the current study, when the inputs in a school which in this study is infrastructure are managed successfully then the expected outputs can be achieved or accomplished. The opposite is therefore true. Thus, the lack or inadequacy of infrastructure can affect the overall administration of the school and thereby affecting the overall purpose of education.

In the context of the current study, it can be inferred that infrastructure facilities in schools are important and as such their availability and their state should be a cause of concern particularly to the users of the infrastructure. In

instances where these facilities are not adequate and even those available are not in the best shape, the overall objective of the school could be affected. In rural areas in Ghana, it has already been established in this study that the adequacy of infrastructure in senior high schools cannot be guaranteed. From the standpoint of the Education Production Function theory, the efforts of all stakeholders of education are needed to ensure that senior high schools in rural areas are provided with adequate infrastructure and existing ones properly maintained.

Aside the education production function theory, the theory of growth was also considered to be of relevance to the study. Infrastructure has been incorporated into the theory of growth (Arrow & Kurz, 1970). Infrastructure was incorporated as part of the growth theory because empirical literature was found to support the role of infrastructure in promoting growth in education (Aschauer, 1989; Easterly & Rebelo, 1994). Specifically, the Easterly and Rebelo (1994) showed the importance of infrastructure on overall productivity in education. The theory of growth assumes therefore that for any institution to grow successfully, the infrastructure in that institution contributes greatly.

In relating the growth theory to the study, it can be realised that infrastructure is a very important aspect of the administration of schools. This is because infrastructure contributes to the overall growth, development and success of the school. As already indicated in the education production function theory, the success or otherwise of any institution depends on several factors, key among which is infrastructure. In the Ghanaian context, the researcher has observed that rural senior high schools usually suffer inadequacy of infrastructure like libraries and ICT laboratories which

ultimately affects the output of the schools. The two theories (education production function theory and growth theory) therefore underpins this study's objective of investigating the availability and state of infrastructure in rural senior high schools as perceived by the users of schools infrastructure (administrators, teachers and students).

Conceptual Framework

The conceptual framework on which this study was based was an adaptation of the model of Nepal (2016) about the relationship between infrastructure and learning outcomes. The framework is shown in figure 1:

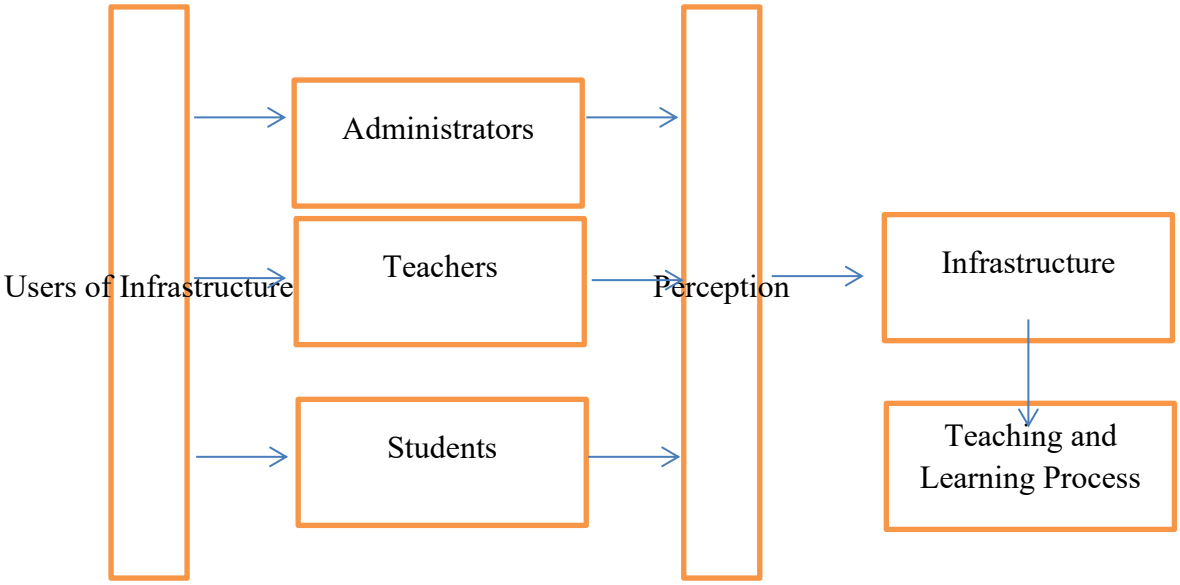

Figure 1: Conceptual Framework of Perception of Users about Infrastructure

Source: Adapted from Nepal (2016)

Figure 1 shows the perceptions of users about infrastructure. It can be seen that the users of infrastructure include administrators, teachers and students. Each of these groups of users has perceptions of the infrastructure in schools. The perception of users about infrastructure is important because, perception can influence the attitude of the users towards the utilization and

maintenance of the infrastructure. Again, it can be realised from Figure 1 that the state of infrastructure in schools can affect the teaching and learning process. This makes infrastructure an important issue to study into.

Aside the conceptual framework on which the study is based, some other concepts that are related to the study are reviewed. These concepts are reviewed because they are key concepts within the study and as such warrants a review in the context of the current study.

School Environment

The school environment involves the entire infrastructure within the schools surrounding which can influence the process of teaching and learning (Mege, 2014). This implies that the school environment is an important aspect of educational system. Without a good school environment, achievement in terms of academic performance can be difficult. In support of this view, Chuma (2012) citing Ajao (2001) asserted that the quality of education depends not only on the performance of the teacher but also in the effective coordination of the school environment.

The point of interest therefore is that much attention should be given to the school environment as is given to the other segments of the school. In this regard, Mege (2014) held the belief that a well-planned school environment can translate into effective teaching and learning process and the overall academic performance of students. In other words, when the school environment is designed perfectly, it is likely to obtain the expected outcomes of education. This assumption is justified because everything within the school environment has an influence on the teaching and learning process. Some of the important elements within the school environment are teacher elements,

student elements and infrastructure. These elements have been found to have an influence on the teaching and learning process and therefore associated with higher achievement in the academic work of students (Oluchukwu, 2000; & Ajayi, 2001 as cited by Kilei, 2012).

Infrastructure in Schools

An important element within the school environment is the infrastructure or facilities within the school. School facilities constitute the major components of both direct and indirect action elements in the environment of learning (Asiabaka, 2008). School infrastructure can be described to mean the site, building, equipment and all the facilities within the school which enhance the teaching and learning activities and at the same time protects the physical well-being of the teachers and the learners (Ayeni & Adelabu, 2012). Infrastructure is an integral component of the learning and teaching context within schools. This is because a school's infrastructure enables students and teachers to access a wide range of tools, services and resources to support learning and teaching. The school infrastructure represents the aesthetic picture of the school conveyed by the position of structure in relation to one another that helps in the realization of school goals and objectives (Bosah, 1997).

The infrastructure or facilities within schools consist of all types of buildings for academic and non-academic activities, equipment for academic and non-academic activities, areas for sports and games, farms and gardens including roads and paths (Asiabaka, 2008). Asiabaka indicated further that infrastructure can also include furniture and toilet facilities, lighting, acoustics, storage facilities and packing lot, security, transportation, ICT, cleaning

materials, food services, and special facilities for the physically challenged persons. Mege (2014) also argued that infrastructure or facilities in the school environment include administration office, staffrooms and offices, classrooms, laboratories, workshop, equipment stores, libraries, hostels, staff houses and school ground.

Further, Harold, Kim, and Orazem (2003) have also indicated that school infrastructure includes classroom level infrastructure and other classroom characteristics (natural light, temperature, acoustics), as well as school utilities (availability of electricity, potable water, and the condition of the building) and other features of the school (such as the existence of a library, a computer lab, or science labs). Infrastructure in schools can also include teaching and learning resources such as classrooms, laboratories, libraries, playing fields, and textbooks. In a similar vein, Olagboye (1998) opined that school infrastructure consist of the basic system and structures which a school needs in order to function effectively and to fulfill the purpose for which it was established.

According to Olagboye (1998), examples of infrastructure include:

a. Building: classroom blocks, libraries, laboratories, workshops, hostels, staff quarters, assembly halls, administrative /office blocks etc ;
b. Equipments: laboratory/workshop equipments, sporting kits and teaching aids etc.
c. Machinery: workshop machines/tools, secretarial machine e.g. computer etc.
d. Vehicles
e. Furniture: classroom/ office, hostels/staff furniture etc.

f. Books: text books, stationary/library books

g. Electrical infrastructure: electrical fittings, fans, AC, overhead electrical conductor lines, generator etc.

h. Water supply infrastructure: pipe born water, borehole, deep well water; tanks, etc.

The infrastructure in schools can also include the administrative block which contains, the office of the school head, the office of other authorities in the school and the staff common room. The rooms can be spacious enough, well decorated for aesthetic impression and should be adequately furnished with shelves, file/book racks, file cabinets with locks, sizeable table with lockable drawers, comfortable padded armed chair and seats for visitors, good window blinds, transistor radio, daily newspapers, magazines, journals and calendars (Olagboye, 1998). When the office environment is well managed, high productivity is inevitable. The library is an important infrastructure within the administration block of schools where books and non–book material, pictures, charts, slides, filing, filmstrips, slim/slide projector etc. can be accessed.

Adequate and reliable bathrooms and toilets can be provided to cater for the sanitary needs of both students and visitors in the administration block of the schools. Other areas of the school infrastructure that require serious attention is the landscape of the school. This has to do with beautification of parts of the school environment such as path ways and play grounds (Asiabaka, 2008).

All these resources go a long way in creating conducive environment that promote effective teaching and learning. This is because learning involves

interaction of students with the environment. Therefore, provision of adequate learning facilities at all levels including equipment and human resources can enhance the quality and relevance of imparted skills of learners (Lumuli, 2009). However, the infrastructure and facilities in schools are not the same everywhere. Boser (2015) asserted that when it comes to school buildings, students from schools which have low-income often get the short end of the infrastructure stick. Most of these schools could be found in rural communities. In urban communities, however, there is usually no problem with infrastructure.

Schools survive and are successful because of the kinds of infrastructure available in them. This is why in Ghana, when government and other stakeholders of education want to improve any segment of a school system, one target of improvement is the school infrastructure. For instance, if the government wants to ensure that a school performs well in science related subjects, the government will make available well-furnished science laboratories so as to make the learning of science easy thereby affecting performance. Some of the major infrastructures found in schools in Ghana are described in terms of how they are related to the current study.

School building and classroom

Writing on the importance of school buildings and classrooms, Olatoye Olutola (2004) noted that the availability of school building and classroom contribute to good academic achievement as they can enhance and make the teaching and learning process effective. He further stated that well sited schools building should be comfortable, pleasant and psychological uplifting. According to Williams (2003), school buildings are very vital inputs to the

educational system. Williams argued that even though school buildings are not responsible for teaching their use may facilitate or impede the teaching and learning process. He however contradicted himself by indicating that school building is not one of the critical variables affecting student achievement because he found no evidence that expensive school buildings would necessarily improve academic achievement.

An attribute of school buildings that has generated a lot of research interest is its age. In the view of Earthman and Lemasters (1996), the age of a building can influence many of the individual factors used in evaluating the condition of an educational facility. Earthman and Lemasters (1996) found in their study that the age of school buildings had significant impact on student achievement and behaviour. They argued that this is because older buildings are usually dilapidated such that windows and other ventilation channels do not function properly. In conditions like this, students' academic work ultimately affecting their academic performance or achievement. In support of this, Chan (1996) revealed that many school buildings had become obsolete despite their structural soundness. He also asserted that age of buildings was an important attribute to consider since in the course of time, the state of school buildings and classrooms become deplorable. According to Mojela (2013), deplorable conditions of public schools infrastructure in South Africa could be attributed to some key reasons such as inadequate government intervention, no sense of ownership by stakeholders, inadequate funding, and vandalism. Mojela indicated further that lack of maintenance, neglect, deferred maintenance and overcrowding were also responsible for the deplorable state of infrastructure. In light of this, Mojela opined that a multi stakeholder

framework for the proper maintenance of public schools infrastructure could be helpful in dealing with the deterioration of infrastructure.

In the context of this study, school buildings and classrooms remain a vital infrastructure in schools especially those in rural areas. school buildings and classrooms do not only provide a place for teaching and learning to take place, but for rural senior high schools, good and modern classrooms can help persuade both students and teachers to choose to be in schools in rural areas.

Library

Library has been seen as an organised collection of sources of information and similar resources, made available to a defined community for reference or borrowing (Akingbade & Falana, n.d.). Libraries are meant to provide physical or digital access to teaching and learning materials. As a result, a library can be a physical building or room or virtual space or both. Modern libraries are increasingly being redefined as places to get unrestricted access to information in many formats and from many sources. The libraries are extending services beyond the physical walls of a building by providing materials accessible by electronic means. Libraries therefore are facilities which are essential in the teaching and learning process because of the access it gives to teaching learning materials. In addition to providing materials, libraries also provide the service of librarians who are experts in finding, organizing and interpreting information.

For a library to be able to fulfill the purpose for which it was established, Zhao and Frank (2003) argued that it must be up to date and at the same time allow access to older materials. In other words, both old and current materials should be available at libraries to ensure that the core mandate for

their establishment is achieved. Again, Frank (2003) indicated that the library should be highly illuminated for reading, adequately ventilated and must be noise free environment. One key to ensuring that libraries are fully functional is the provision of funds. This assertion has been supported by the advocacy of Akingbade and Falana (n.d.) that libraries must be properly supported financially to able to fund all the materials needed in them.

The relationship between library usage and academic achievement cannot be overemphasized. In his study on the relationship between instructional facilities and academic achievement, Popoola (1989) found that library usage correlates with academic achievement and so concluded that the schools with well-equipped libraries achieve higher academic performance. In support of this, Ola (1990) also concluded that a well-equipped library is a major tool that can lead to higher academic achievement.

In relation to the current study, it appears that the importance of libraries are not yet seen, since from the observation of the researcher, most schools, especially those in rural areas, do not have well-furnished and functioning libraries. As such by carrying out this study, the results will provide factual evidence for the non-existence of libraries in schools. This will help stakeholders like the Ministry of Education and Ghana Education Service to take steps in ensuring that libraries are provided in all schools.

Information and Communications Technology (ICT)

Another facility of consideration in this study is Information and Communications Technology (ICT). ICT has been seen as an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software,

satellite systems as well as the various services and applications associated with them, such as video conferencing and distance learning (Rouse, 2005). Similarly, Asogwa (2008) explained that ICT is a fusion of information technology and communication technology. This is therefore the most potent force in shaping the 21st century (Ayo, 2001). ICT has made the world a global village thus repositioning the social, economic, political and academic outlook of man (Chinwe, 2005). Rouse (2005) has indicated further that ICTs are often spoken of in a particular context, such as ICTs in education or health care. Therefore, Lockwood and Cornell (2013) have opined that schools should have a programme designed to ensure that technology infrastructure is refreshed or renewed or updated once it is no longer secure or economically viable to support or meet the needs of the users.

Pelgrum (2001) gave a list of ten of such factors that has an influence on the integration of ICT in schools. Pelgrum (2001) argued that four major factors out of the ten include personal ideas about the contribution that technology can make to the processes of teaching and learning and classroom management; teachers' lack of knowledge and skills; insufficient number of computers and ICT infrastructure; and difficulty in integrating ICT instruction in classrooms. The chief among all these factors has to do with the availability of ICT infrastructure. Ottesen (2006) revealed that one fundamental problem facing ICT integration in schools is the lack of computer infrastructure. In line with this claim, Norris, Sullivan, Poirot, and Soloway (2003) also found that appropriate access to technology infrastructure is a key factor in the effective integration of technology in schools. Norris et al., (2003) argued on this basis that there was a substantive correlation between technology access and use.

The era of education we are in is the ICT era. As a result, any education cannot be complete without some knowledge in ICT. This is why the availability, adequacy and usage of ICT infrastructure in rural senior high schools is assessed in this study.

Laboratories

Laboratory has been conceptualized as a room or building specially built for teaching and demonstration of theoretical phenomenon in practical terms (Akingbade & Falana, n.d.). Laboratories are suitable for teaching subjects which usually have more abstract concepts. Laboratory facilities provide controlled conditions in which scientific or technological research, experiments and measurement can be carried out. As a result, when laboratories are well-equipped, teaching and learning can be well facilitated. Against this background, Soyibo and Nyong (1984) argued that schools with well-equipped laboratories produce better academic performance compared to their counterparts without well-equipped laboratories. The argument by Soyibo and Nyong was supported by the claim of Federal Government of Nigeria (1998) who asserted that students instructed with the help of laboratory facilities had higher academic achievements.

Schools with well-equipped laboratories are able to perform better than schools without laboratories or those with ill-equipped laboratories (Owoeye & Yara, 2010). This is because, according to Owoeye and Yara (2010), laboratory work stimulates the interest of learners as they are made to personally engage in useful scientific activities and experimentations.

In Ghana, laboratories are of essence in schools because there is increasing demand of students with science and technology background in the

work force. However, this cannot be possible if students do not get the best of science education, which can happen when laboratories are provided and well-furnished in senior high schools.

Relevance of Infrastructure in Schools

The school infrastructure, particularly building, protects pupils, students and teachers from the sun, the rain, heat, cold, violent storm and insects. It also represents a learning environment which has a tremendous positive impact on the comfort, safety and academic performance of school children. In support of this, Walberg and Thomas (1972) argue that children learn best when they can actively explore an environment rich in materials. When a school has all the teaching and learning materials required for teaching and learning, students can freely learn and understand in a practical way.

The importance of infrastructure in the school environment is what makes the lack of it an issue of concern. Arisi (2002) stressed that inadequate classroom spaces have resulted in over-crowding in schools. Many village schools which were built with self-help efforts can be damaged due to long neglect. In the view of Boser (2015), the lack of high-quality infrastructure can shape student outcomes. Students' performances are therefore linked to the facilities within schools. Ultimately, the infrastructure within schools affect the image of a school is dependent on the quality of its infrastructure (Mege, 2014).

Asiabaka (2008) indicated that facilities are needed in schools for some major reasons. The reasons include the illustration of concepts, provision of firsthand experience, experimentation, demonstration, scientific investigation

and discovery, diversity of thoughts, and protection and comfort of the individuals in the schools. For instance, facilities like science laboratories are needed to adequately demonstrate science principles and concepts for students to better understand the principles and concepts taught. Again, to enable students get first-hand experience in the use of ICT facilities, ICT laboratories need to be provided. This implies that facilities are relevant in schools.

Schneider (2002) also depicted school infrastructure as being a complex system with relevance to students and other individuals within the school community. Aside students who benefit from school facilities, teachers as well as all individuals within the school benefit from school facilities

Users of Infrastructure in Schools

Three main users of infrastructure are considered in this study. They are school administrators, teachers and students. These users are considered in the study because the physical facilities of the school have a variety of effects on teachers, students and the teaching and learning process as a whole.

School administrators

Administrators are the frontline supervisors of school administration and are therefore expected to discharge both administrative and supervisory duties in their schools. According to Donkor (2009), the Ghana Education Service (GES) a national organisation under the Ministry of Education prescribes the functions and responsibilities of the school administrators (Head teacher and assistant head teacher) as including ceremonial leadership and co-ordinator of various roles of school administration, taking decisions and managing human and materials resources. Other responsibilities include the day to day running of the school and the maintenance of school infrastructure.

The school administrators considered in the study include Headmasters, Assistants and Head of departments. According to Mege (2014), the school administration is a crucial factor in the success of a school. He stressed that the headmaster should ensure that all factors within the school that make the school environment favourable for teaching and learning are managed well to facilitate academic work. The headmaster is therefore seen as the first supervisor of all facilities within the school. According to Mege (2014), since availability of instructional materials is a core determinant in the successful implementation of any curriculum, it is the responsibility of the head teacher to ensure that there is proper selection and procurement of teaching and learning resources.

Assistant headmasters are those who support the headmaster in the running of the school. Most schools have two assistant headmasters. One is responsible for the academic work in the school while the other is responsible for the administrative functions of the school. The one in charge of the administrative functions of the school usually ensures that the facilities in the schools are managed and maintained very well. Heads of departments in school are also responsible for the administrative functions within his or her department. Therefore they have to ensure that facilities are provided and are maintained well within their various departments.

In order for any organization or institution to survive depends largely on the quality of administrative services available. Even though, administration can defy a single definition, all attempted definitions revolve around concepts which involves coordination of activities. In its general sense, Wilson (cited in Ashong, 2010) defined administration as the art of getting

things done and ensuring that the right processes and methods are all put in place. However, in terms of school administration, Ashong (2010) opined that administration in its broadest sense is referred to as the process of integrating the effort of personnel and the utilisation of appropriate materials so that it will effectively promote the development of human qualities.

In relation to the current study, the administrative arm of schools happens to be very vital in the success of schools. This is so because all administrative decisions and provision of all infrastructures have to be sanctioned by the administration of the schools. They are considered as users of infrastructures in schools in this study because they need well-furbished offices to be able to carry out their duties very well.

How infrastructure in rural schools affect the administration of the schools

The linkage between infrastructures in rural senior high schools and the administration of the schools have generated research interest. Ayeni and Adelabu (2012) revealed that effective management of learning infrastructure is the prime responsibility of the school head and other stakeholders. Ayeni and Adelabu (2012) further revealed that the administrative responsibility for satisfactory physical environment is not limited to the provision of new facilities but also directing the available resources to the maintenance of learning facilities.

The study of Durosaro (1998) on school plant planning and the administrative effectiveness of principals in secondary schools in Oyo State in Nigeria revealed that schools that are well planned and maintained had higher student retention and even more effective than others. A similar study by Olutola (1989) in Kwara State revealed that the administration and overall

performance of schools were affected by the adequate provision of the necessary facilities. Lowe (1990) in his study on the interface between educational facilities and learning climate in schools in Texas found that overall school facilities influenced the administration of schools. Every aspect of a school's administration such as teachers' moral and students' performance were found to be influenced by school facilities. The study of McGruffey (1992) also showed that proper building maintenance was related to fewer disciplinary problems. Thus, school infrastructure was related to the administration of schools.

It can be seen from the forgoing that infrastructure is related to the administration of schools. In essence, the challenges of infrastructure in schools can affect the work of administrators within senior high schools.

Teachers as users of infrastructure

In schools, teachers form part of the users of school infrastructure or facilities. To be able to successfully utilize infrastructure, teachers should communicate their expectations for facilities as they relate to enhancing student learning and also treat facilities with respect. Teachers' perception towards infrastructure in schools is therefore important. This is because their perception will shape their thoughts about the infrastructure in schools and thereby influence their overall concern for infrastructure.

Teachers the main group of people who have lots of physical encounter with facilities in schools, and so how they treat the facilities can affect the maintenance and life span of facilities. For instance, in an ICT laboratory in school, it is the responsibility of the ICT teacher to ensure that the computers

are well handled and maintained. It is against this background that the perception of teachers regarding school infrastructure will be assessed.

Students as users of infrastructure

According to Asiabaka (2008), schools exist to serve socio-economic and political needs of the ever-changing society. Schools receive inputs from the external environment in the form of human and material resources, process these inputs and empty same into the society as finished products and services. Thus, students who graduate out of schools are the output gained from the inputs. The quality of the products produced bears a direct relationship with the quality of the facilities used in the process of the production. Thus, the quality of students produced from schools is directly related to the kinds of facilities available in the schools. This implies that state of the art facilities need to be provided in schools to prepare students for life in the outside world. To ensure that school infrastructure or facilities are utilised and maintained well, the school needs students who see school facilities as their learning environment and as such treat facilities with respect. This can help enhance the life span of school facilities thereby affecting teaching and learning positively. The perceptions of students concerning infrastructure is therefore important since it ultimately culminates in how the students are ready to help maintain and utilise in a good way the infrastructure in schools.

Students are considered users in this study mainly because they are the individuals with the most direct access to most infrastructure facilities in schools. For instance, students are those who use ICT facilities as well as classrooms, libraries among others. Their perception of the infrastructure will

therefore inform the researcher about the availability and state of infrastructure in the study area.

School Infrastructures and Teaching and Learning Process

Teaching and learning in schools are closely associated with the infrastructure within the schools. Mege (2014) suggested that poor lighting, noise, high levels of carbon dioxide in classrooms and inconsistent temperatures make teaching-learning process difficult. This, according to Mege, is so because students might struggle with concentration while the teacher might also struggle with keeping the focus of the student on the subject matter. In this regard, Mege argued further that unless schools are adequately provided with physical facilities and instructional materials, effective teaching and learning may not take place.

It has been argued by Asiabaka (2008) that school facilities are the material resources provided for staff and students to optimize their productivity in the teaching and learning process. This assertion by Asiabaka implies that facilities in school are essential to the success of the teaching and learning process. Therefore, poor maintenance of these facilities, particularly ineffective ventilation systems can also lead to poor health among students resulting in higher absentee rates among students (Lyons, 2001; Ostendorf, 2001; Frazier, 2002). This happens because the effects of the lack of facilities can go beyond the direct effects on students' ability to learn to creating uncomfortable environment for both students and teachers.

In relevance, Ajayi and Ayodele (2001) posited that the availability of infrastructure is quite important to achieving effectiveness in instructional delivery and supervision in the school system. In support, Altbach (1998)

argued that adequate facilities are essential for academic work. In line with this view, Chandan (1999) opined that for effective teaching to take place in any educational setting there must be provision of adequate and quality physical facilities.

In the current study, therefore, the teaching and learning process can be deemed to be effective when the appropriate teaching and learning materials are available. These teaching and learning materials are considered part of the infrastructure. For instance, the teaching and learning of science will be made much easier if the school has a well-furnished and modern science laboratory.

Management and Maintenance of Infrastructure in Schools

Efficient management of school physical facilities is mandatory in order to make the school a pleasant, safe and comfortable place that will increase students' attendance motivation and willingness to participate adequately in both curricula and co-curricular activities (Adeboyeje, 2000). According to Ayeni and Adelabu (2012), school heads are the custodians of their school infrastructure. Thus, it is the responsibility of school heads to ensure that all the infrastructure and facilities of the school are in good working condition, are well protected, and are used for the purpose(s) for which they were acquired.

School administrators and authorities have the duty to motivate staff members as well as students to imbibe and internalise maintenance culture with respect to the infrastructure in the school. The teachers are to assist the school heads in the maintenance of the school infrastructure and learning environment to ensure that there is a conducive teaching and learning environment in school. Teachers are also to see that every item in the schools

(the classroom building, furniture, audio-visual and other teaching aids, etc) are in good condition and to promptly report any deterioration to the school head for the necessary maintenance action.

Akingbade and Falana (n.d.) gave four main components involved in the management of school facilities. These components are important because how infrastructures or facilities are managed in senior high schools is of relevance to the current study. Without appropriate management of infrastructure, there could be dire consequences on students' output. For instance, if a science laboratory is not managed well, the materials and instruments in the laboratory might be destroyed thereby affecting the teaching and learning process. The four main components of facilities management include provision, utilization, maintenance and improvement of facilities.

Provision of school facilities

Facilities cannot be managed if they are not provided, as such the first and most important in facilities management is the provision of facilities. Educational outcomes and targets cannot be achieved if resources or facilities are not provided. It is therefore the responsibility of all stakeholders such as the Government, Ministry of Education (MoE), Ghana Education Service (GES), school authorities and the Parent Teacher Association to ensure that the required facilities are provided in the various schools. Even though the provision of facilities is necessary in schools, it is one of the most neglected areas in the school system (Olagboye, 2004). There is even a visible disparity between the provision of facilities in rural schools and urban schools.

Utilization of school facilities

In the view of Olagunju (2011) the process of managing and organizing resources is called resource utilization. Olagunju indicated further that the utilization of resources in teaching is what brings about productivity in learning since senses of students are stimulated and students are motivated as well. Utilization has also been defined as the degree or extent to which an item has been put to effective use (Adeboyeje, 2000). Utilization can be in several levels including non-utilization, under-utilization, maximum-utilization, optimum-utilization and over-utilization.

Adeboyeje explained the various levels of utilization in the following ways:

a. Non-utilization: This is when a particular facility is not put into use at all.
b. Under-utilization: This occurs when a facility is not used in its full capacity.
c. Maximum-utilization: This is the situation where facilities are put into effective usage according to their original and primary objectives.
d. Optimum-utilization: In a situation where facilities are used for many purposes by the school and members of the community, it is seen as optimum-utilization.
e. Over-utilization: In situations where a facility is used more than its capacity, there is over-utilization.

It should be noted that resources put into maximum and optimum usage are not wasted. They are likely to enhance achievement of educational objectives. According to Eze (2002) resources or facilities can only be utilized when they are available and so there should the provision of facilities in

schools before there can be proper utilization of these resources or facilities for effective teaching and learning to take place. In providing facilities, it should be noted that the provision should be in both quality and quantity for an effective teaching and learning process (Umeoduagu, 2006).

Maintenance of school facilities

Facilities require maintenance because according to Akingbade and Falana (n.d.), facilities tend to depreciate as soon as they are provided and are utilized or put into use. This implies that facilities need to be maintained in order to put them into the right physical and working conditions. Maintenance therefore enhances performance and durability of facilities while preventing wastages. Shohet and Straub (2013) discussed increasing demands on maintenance programme to provide tools that will support maintenance planning. An issue of concern in maintenance is an observation made by Isyaku (2002). Isyaku observed that lucrative building maintenance contracts are awarded without due process which ultimately leads to poor maintenance of buildings. This is because according to Asiabaka (2008), school administrators and teachers who mostly use school facilities usually lack knowledge of facilities maintenance planning. As a result, they are unable to incorporate facility or infrastructure maintenance into the management of the school. Carrying out maintenance works on school infrastructure and facilities is necessary for the safety of the users and preserving the physical conditions of the infrastructure in operational state at all times. Maintenance is however possible if maintenance tools like funds are provided.

Improvement of facilities

Apart from depreciation or deterioration, facilities tend to be out dated and may need some improvement or change. As a result, facilities will need to be improved periodically to ensure that there is a destructive damage to the existing facilities. Improvement of facilities implies alteration or modification of facilities to suit a new demand, new situation or programme (Akingbade & Falana, n.d.).

Aside all these management and maintenance practices for handling school infrastructure. Taiwo (2000) and Sani (2007) identified some specific maintenance of infrastructure approaches. These included:

1. The Individual School Custodian Maintenance Approach: In this approach, maintenance is highly centralised and the school head ensures that maintenance tools are not only provided but subordinate staff execute maintenance duties on daily basis. The success of this approach depends on how dedicated the head of the school is dedicated to his duties. This means the dedication or negligence of the school head is vital for this approach to work.
2. District Wide Maintenance Approach: In this maintenance approach, a fully staffed maintenance department with an expert maintenance crew is put in place to handle different aspects of maintenance works within the school. This approach has the advantage of specialisation and cost effectiveness.
3. Situational Maintenance Approach: This approach of maintenance depends on the availability of funds that are usually generated by charging the public for their use of school facilities. The money

generated is used for the maintenance of facilities. Senior high schools could charge some money for the use of their halls, play grounds, furniture, vehicles and other facilities by the community.

4. Preventive Maintenance Approach: This is a well-planned pro-active and systematic maintenance approach that constantly checks and takes preventive measures before problems will arise. This is regarded in this research as the best maintenance approach.

Review of Related Empirical Studies

This section reviewed related empirical studies. The review was done according to subheadings.

Availability of Infrastructure in Schools

In senior high schools, the importance of infrastructure cannot be downplayed. As such, the availability of infrastructure in schools is an issue of great concern to researchers and educators in general. Several studies have indicated that the dearth of tools, equipment and other forms of instructional materials in our schools is traceable to neglect (Dogo, 1997; Adegun, 2001; Onyejemezi, 1991). The implication of this claim is that there is a lack of infrastructure or facilities in schools. A survey was conducted by Yaduma and Moses (2005) on workshop and laboratory facilities in vocational training centres and technical colleges in Bauchi State, Nigeria. By employing a descriptive survey design, a structured questionnaire was administered to administrators, teachers and workshop attendants. The study revealed that the schools lacked workshop and laboratory facilities making it difficult to undertake practical work. In a similar vein, Muazu (2003) investigated the problems that militated against the effective implementation of technical and

vocational programmes in vocational training centres in Adamawa State, Nigeria. Muazu found *inter alia* that the vocational training centres lacked training facilities which greatly affected students' practical work.

The studies reviewed imply that schools lack the required facilities to be able to successfully achieve their objectives. The relevance of this review to the current study lies in the fact that if schools outside Ghana have issues with infrastructure, it is important to assess if the same could be said of Ghana. By the observation of the researcher, it has been the opinion of the public that schools in Ghana lack the required infrastructure. Therefore, carrying out this study will help get empirical evidence as to whether the claims of the public are true or not.

Current State of Infrastructure in Rural Schools

Researchers have been interested in the state of infrastructure in schools especially schools in rural areas. Ipaye (2002) carried out a study on teachers' apathy to teaching in Nigeria. HE used descriptive survey in identifying the reasons behind teacher apathy in rural areas. After administering a questionnaire to teachers, Ipaye (2002) came out with some findings. Ipaye's study revealed overall the main reason for teacher apathy was the lack of infrastructure in schools. As a result, Ipaye concluded that schools in rural areas have poor conditions and also lack adequate infrastructure. The implication of the findings of Ipaye (2002) is that in rural senior high schools, a major problem or concern is the lack of infrastructure. In a similar vein, Ayeni and Akinola (2008) carried out a study on the influence of principals' leadership styles and motivation of teachers on quality assurance in secondary schools in Ondo State, Nigeria. They adopted the

descriptive survey design and used questionnaires in eliciting the views of teachers. Among the things that affected teacher motivation the most was the inadequacy of school facilities. Ayeni and Akinola (2008) therefore concluded that most secondary schools lack well equipped staffrooms and more conducive classrooms to achieve quality in academic work. Thus, it can be implied that secondary schools in the Ondo state did not have well-equipped and conducive facilities. The inadequacy of the facilities was the most influential factor on teacher motivation. Therefore, on this basis the claim by Fafunwa (2010) in a newspaper report that there is a big gap in quality of education because the motivation of teachers to teach was affected by the large number of students in crowded classrooms, using inadequate and obsolete equipment can be said to be true.

In studying the factors that affect classroom activities in schools in Kenya, Trijuman (1994) cited in Bakari, Likoko, and Ndinyo (2014) sought the views of students and teachers. He found after collecting the views of both students and teachers that one important factor in schools is school infrastructure. Trijuman however identified that there was inadequacy in terms of school infrastructure facilities. Therefore, He concluded that in Kenya, there was a need for adequate provision of facilities in enhancing quality of classroom control and discipline on the teaching-learning atmosphere as a whole. This view was supported by the view of Mwiria (2004). Mwiria carried out a study on the factors that affect the educational system in Kenya. His study indicated that to achieve a strong educational foundation, the Kenya secondary education system needs adequate facilities such as blocks of classrooms, furniture, teachers, instructional materials, libraries and other

school equipment. Mwiria concluded from his findings that there was inadequacy of facilities in schools in Kenya.

Further, Edwards (1992) in his study of building conditions, parental involvement and students achievement in the District of Columbia public school system, found that students in school buildings that were in poor condition achieved 6% below student in school buildings that were maintained in excellent condition. He concluded that decaying school facilities, damaged electrical fittings, inoperative heating and cooling systems affecting the learning of students and morale of staff. Omotoso (1991) carried out a meta-analysis on several studies on the availability of physical facilities and equipment in African schools. Omotoso revealed from the meta-analysis that the buildings in most senior high schools in Ondo State were old and in poor conditions. Omotoso further showed that many of the classrooms, laboratories, examination halls, libraries and office furniture were in a terrible state of shabbiness resulting in poor academic performance. Still in the review of Omotoso, it was shown that most of the windows in the studied schools were out of use while fluorescent tubes for providing electricity were also out of place. In addition, Izobo-Martins et al. (2014) carried out a study on infrastructure conditions in public secondary schools, Ogun State Nigeria. Their study used descriptive survey research method and stratified random sampling technique to sample Thirty-Six Public Secondary Schools out of Forty-Seven in Ado-Odo/Ota Local Government Area. Data were collected using questionnaire and observation methods. The analysis was done through descriptive statistics and chi square tests. Their study revealed that existing public secondary school buildings in Ogun State, Nigeria lack adequate

maintenance attention and as a result most public secondary school buildings were in very poor and deplorable conditions. The inadequacy of infrastructure in schools has also been confirmed by the study of Mege (2014) on the influence of school environmental factors on the teaching-learning process in public primary schools in Lower Nyokal division Homabay district, Kenya. Mege's study adopted descriptive survey design and employed questionnaires in gathering information from teachers and head teachers while focus group discussion guide was used with the pupils. Her study revealed that schools have inadequate physical facilities, with some being totally unavailable. In addition, she found that instructional materials were generally insufficient. This she claimed affected more rural schools than urban schools.

Overall, it can be realised from the studies reviewed that infrastructure and facilities in schools are in poor and deplorable conditions. In carrying out this study, it is expected the current state of the infrastructure in the rural senior high schools in the Assin North Municipality will be brought to light.

How Infrastructure Affect Teaching and Learning

The state of infrastructure in schools has an impact on the students in schools. This has been studied by several researchers. Adesola (2008) cited in Akingbade and Falana (n.d.) carried out a study on the factors that affect teaching and learning in secondary schools in Nigeria. Adesola's findings showed that the level of availability of resources is a plus to teachers as it goes a long way in showing the level of resourcefulness and commitment towards effective delivery of lessons. The implication of his finding was that resources and infrastructure in schools are of importance in the teaching and learning process.

Durosaro's (1998) study on school infrastructure planning and the administrative effectiveness of principals in secondary schools in Oyo revealed that schools found that there was a positive relationship between good school environment and effective teaching and learning activities. Aderounmu, Aworant, and Kasali (2001) cited in Akingbade and Falana (n.d.) carried out a study on the impact of the school facility in science and mathematics education on student performance at the National Technical certificate (NBC) examination in five government technical colleges in Oyo state in Nigeria from 2000-2005. The study found that facilities had a significant influence on the performance of students. The study of Mege (2014) also made conclusions similar to that of Aderounmu et al. (2001). The study of Mege (2014) was on the influence of school environmental factors on the teaching-learning process in public primary schools in Lower Nyokal division Homabay district, Kenya. Mege's study concluded that the inadequacy of physical facilities in schools has been found to influence teaching-learning process and ultimately having a great impact on performance of students in examinations.

Further, a study on the influence of physical resources on academic performance in Lagos State carried out by Adewunmi (2000) showed that the availability of adequate number of physical facilities had significant influence on the academic performance of students. Adewunmi argued therefore that it was important for adequate number of physical facilities to be provided in schools. The need for the availability of physical materials or facilities in the school system would affect teaching and learning in the sense that it would boost teachers' motivation and thereby affect their performance.

Sani (2007) after investigating the relationship among school facilities and school effectiveness in Kebbi State secondary schools in Nigeria made several revelations. A significant, positive and high relationship was found between school infrastructure and students' academic performance. In studying the factors influencing performance among primary and secondary school pupils in the Western province of Nairobi Kenya, Eshiwani (1993) showed that elements in the school environment such as classrooms, desks and books have a direct impact on good performance among the students in developing countries. This goes to support the view that for there to be an effective teaching and learning process, school facilities are essential.

Since it has been established from the literature that the availability of facilities affect teaching and learning positively, it can be inferred that the unavailability of facilities can impeded the teaching and learning process. This view is seen in the findings of Ayeni and Adelabu (2012). Ayeni and Adelabu (2012) investigated the state of learning environment and infrastructure, together with their effects on teaching and learning activities and the extent to which they are being maintained among public secondary schools in the Ondo State, South-West, Nigeria. Their study adopted a descriptive survey design paradigm and gathered data from 60 principals and 540 teachers. Their study concluded that infrastructure is expected create a more conducive environment for teaching and learning and so the lack and inadequacy of infrastructure can affect the level of quality education in secondary schools. Specifically, Ayeni and Adelabu (2012) indicated that deficiencies in learning infrastructure constituted impediments to effective classroom management, curriculum delivery and the full realization of secondary education objectives in Nigeria.

From their conclusion, it can be inferred that both teachers and heads of schools viewed the lack and inadequacy of infrastructure as detrimental to the teaching and learning process in schools. The study of Ayeni and Adelabu (2012) corroborated the findings from the study of Ademilua (2000). In a study carried out in Ekiti State by Ademilua (2000) on the role of school resources in the academic performance of students, it was found that inadequate provision of school resources has been a major factor of poor students' academic performance. Ademilua therefore argued from his findings that without adequate physical facilities there would be a continuous decline in the academic performance of students.

The inadequacy of infrastructure in schools can affect students regardless of the cultural background. The study of Bernstein (2006) on the relationship between school infrastructure and academic achievement in the United States of America showed that attending well maintained schools with good classrooms correlates with higher achievement than attending poorly maintained schools with poor classrooms. Thus, schools with adequate facilities have a better chance of providing quality education in an effective way. Cash (1993) also examined the relationship between building condition and student achievement in small, rural Virginia High Schools. Cash found that student scores on achievement test were 5% lower in school buildings with poorly maintained laboratories, libraries, workshops and classroom furniture. In a similar vein, Bower and Burkett (1999) studied the effects of maintenance of physical facilities on students' academic performance in Florida High Schools. His sample was made up of 1000 students from 50 schools across urban and rural areas, and public and private schools. Bower

and Burkett found that there is a significant and positive relationship between the maintenance of classroom, equipment, electricity, water supply, playgrounds, landscaping and students' academic performance. Furthermore, Heyneman and Loxley (1993) in their study on the effect of availability of physical facilities on academic performance revealed that the existence of a school library related significantly to achievement in Brazil, China, Botswana and Uganda.

Drawing from all the studies reviewed, the importance of school infrastructure in teaching and learning cannot be downplayed. The current study is conducted in the Ghanaian setting different from the other cultures in which the studies reviewed were conducted. However, a similarity among the studies is the fact that the current study assessed similar variables to those studies.

Measures Put in Place to Overcome Infrastructural Challenges on the Administration of Rural Schools

The importance of infrastructure in schools is what makes it important for some measures to be place to overcome infrastructural challenges in schools. However, from the search of the researcher, it appeared that not many studies have conducted in this regard. Some few of such studies are reviewed. The study of Durosaro (1998) on school plant planning and the administrative effectiveness of principals in secondary schools in Oyo State in Nigeria reported that even if the educational curriculum is sound and well operated while the school facilities are in disrepair and badly managed, the result of the teaching/learning activities will be negative. Therefore, there was the need to adopt appropriate measures to ensure that infrastructure and facilities are

properly managed. Durosaro concluded that proper management of facilities was the best measure in overcoming infrastructural challenges in schools. His conclusion was because he found that even though some schools had facilities, the facilities were in bad shape and made the school environment not conducive for teaching and learning.

Olagboye (2004) in studying educational administration planning and supervision in Nigeria showed that existing buildings must be maintained and made functional by providing proper lighting, ventilation and temperature condition for their effective and efficient utilization to ensure good environment within schools. Olagboye argued further that school heads should direct the available resources to the maintenance of learning facilities. It can be implied from the studies reviewed that school administration have a responsibility of putting up the right measures to ensure that infrastructure in schools is in good stead.

Summary

This chapter reviewed literature related to the current study. The review was done in three main sections. It included the theoretical framework, the conceptual framework and the review of related empirical studies. It was found from the review of literature that even though some infrastructure facilities were available in schools, the facilities were not adequate. Again, the literature showed that most of the infrastructure facilities in schools were not in good state. In addition, the review showed that the availability or unavailability of infrastructure can affect teaching and learning and also affect administration of schools. From the literature reviewed, it appeared that there

was a dearth of literature on availability and state of infrastructure in rural senior high schools in Ghana. This study therefore seeks to bridge this gap.

CHAPTER THREE

RESEARCH METHODS

Introduction

The chapter presents the research design, the study area, population, sampling procedure, instrument, data collection procedure, and the data processing and analysis.

Research Design

To be able to carry out this study, the descriptive survey design approach was used. According to Ary, Jacobs and Razavieh (2006), descriptive research studies are studies designed to obtain information which concern the current status of a phenomenon. This view is similar to the view of Gay (1992) and Fraenkel and Wallen (2000) who both opined that descriptive survey includes presenting facts or current conditions concerning the nature of a group of persons, a number of objects or a class of events.

Descriptive survey research designs are advantageous in several ways. According to Sokpe, Ahiatrogah, and Kpeglo (2011), descriptive survey research designs have the advantage of producing a good amount of responses from a wide range of people compared to a qualitative design which gathers information from a small number of people. Again, descriptive survey research deigns has the merit of providing a clear picture of events and people's behaviour on the basis of data gathered at a point in time (Fraenkel & Wallen, 2000). Descriptive survey research in the view of Neuman (2000) is also helpful in indicating trends in attitudes and behaviours, and enabling

generalization of the findings of a study. Thus, in the context of this study, the descriptive survey would be helpful in knowing how the users of school infrastructure (Administrators, teachers and students) perceive the availability and state of infrastructure in their schools. Since perception can be an antecedent of attitude, the descriptive survey suits the current study.

Regardless of these merits of the descriptive survey design, there are some criticisms. One specific criticism of the descriptive survey research design has been the view that it is superficial and not worthy of recognition as a research approach to private or personal matters which respondents may not be completely truthful to delve into (Fraenkel & Wallen, 2000). This criticism did however not affect the current study because the main subject of the study is not private or personal since the subject of the study is about the infrastructure facilities in rural senior high schools in the Assin North Municipality. Another weakness of the descriptive survey research design is that there is the likelihood of the significance of the data becoming neglected if the researcher becomes overly focused on only the range of coverage of the study (Kelley, Clark, Brown, & Sitzia, 2003). Thus, depth of data will be sacrificed for the quantity of the data. In this study, the significance of the data will not be lost since the data will be gathered using two different means, questionnaire and a semi-structured interview guide. Therefore, the depth of the data will be obtained through triangulation of the data obtained from the three data collection instruments.

Moreover, the descriptive survey research design is considered appropriate for the current study because, according to Mege (2014), descriptive survey is relevant when the researcher wants to collect, analyse

and report information as it exists in the field without manipulation of the variables involved. In relation to this study, the researcher aims to gather data and report about the perception of users of school infrastructure about the availability and state of school infrastructure, hence no variable would be manipulated. Again, this design allows information to be collected systematically and fully within a limited time, with limited resources (Sayer, 2000).

Study Area

The Assin North Municipality in the Central region of Ghana is among the twenty (20) Metropolitan/Municipal District Assembles (MMDA's) in the Central Region of Ghana out of which Assin South District was created in August 2004 (Ghana Statistical Service (GSS), 2014). Assin North is situated in the northern corner of the Central Region and shares common boundaries with Adansi East in the Ashanti Region, to the North, Upper Denkyira to the North-West, Assin South to the South, Twifo Atti Morkwah to the West and Birim South in the Eastern Region to the East. The municipality covers a total land area of about 1,150 sq.km and comprises about 500 settlements including Assin Foso (the Municipal Capital), Assin Nyankumasi, Assin Akonfudi, Assin Bereku, Assin Praso and Assin Kushea.

The population of Assin North Municipality according to the 2010 Population and Housing Census is 161341 representing 7.3 percent of the central region's total population. Males constitute 49.7 percent and females represent 50.3 percent. Again, a majority of about 63.1 percent of the population reside in rural localities (GSS, 2014).

In terms of education, 80 percent of the population 11 years and above are literate while 20 percent are not literate. The proportion of literate males is higher (53.2%) than that of females (46.8.2%). Again, of the population aged 3 years and above (64,528) in the municipality, 47.1 percent are currently attending school 38.2 percent have attended in the past and 17.8 percent have never attended (GSS, 2014). In terms of occupation, of the employed population, majority are engaged as skilled agricultural, forestry and fishery workers, while the rest are engaged in service and sales, craft and related trade, and managers, professionals, and technicians.

Figure 2: Map of Assin North Municipal

Population

Population in research according to Ary, Jacobs and Rezavieh (2002) refers to the entire group of individuals to whom the findings of a study apply. In other words, it is the group the researcher wishes to make inferences about. Again, Bryman (2001) defined population as any set of person or subjects that possess at least one common characteristic. The population for the current study involves all the students, teachers and administrators in the rural senior high schools within the Assin North Municipality. There are three public rural

senior high schools in the Assin North Municipality. The total population of students in the three senior high schools according to the statistics obtained from the three schools is 2600. Therefore, the population of the study is 2600. The population of teachers obtained from the schools is also 140 forming the population of teachers for the study. Again, the number of administrators obtained from the statistics from the three schools is 24, which also forms the population of administrators for the study.

The breakdown of the population of administrators in the three senior high schools in terms of designation, school and gender is illustrated in the Table 1 and Table 2.

Table 1- *Population Distribution of Administrators on the Basis of Designation, Gender and School*

Name of School	**Designation**			**Total**
	HEAD	**ASST.**	**HOD.**	
Assin North SHS	1	3	6	10
Assin State SHS	1	2	4	7
Gyaase SHS	1	2	4	7
Total	**3**	**7**	**14**	24

Source: Statistics from the schools (2017)

Table 2-*Population Distribution of Teachers and Students on the Basis of School*

Name of School	**Teachers**	**Students**
Assin North SHS	65	1500
Assin State SHS	42	600
Gyaase SHS	33	500
Total	**140**	**2600**

Source: Statistics from the schools (2017)

Sample and Sampling Procedures

Sample has been defined by Ofori and Dampson (2011) as the segment of the population that is selected for an investigation. According to Krejcie and Morgan's (1970) table for determining sample size, a sample of 335 is suitable for a population of 2600. However, to take of attrition a sample of 350 was used for the study. Again a sample of 110 teachers was used for the study. According to Krejcie and Morgan's (1970) table for determining sample size, a sample of 103 is considered appropriate for a population of 140 teachers. Therefore, taking a sample of 110 is to take care of any member of the sample that would be lost. Finally, all 24 administrators was used for the study. The sampling procedures that were used were purposive, stratified, simple random and census sampling.

Purposive sampling technique was used to select the three (3) government assisted senior high schools that would be involved in the study. Purposive sampling according to Creswell (2002) is when a researcher intentionally selects individuals and sites to learn or understand a phenomenon. Creswell and Plano-Clark (2007) also explained that purposive sampling allows the researcher to intentionally select participants who have experience with the central phenomenon or the key concept being explored. This is because in the view of Cohen, Manion and Morrison (2003) purposive sampling enables researchers to handpick the cases to be included in the sample on the basis of their judgment and typicality. Patton (2002) asserted that the logic and power of purposive sampling lies in selecting information-rich cases for in-depth study. As a result, the purposive sampling procedure enables the researcher to sample views from different categories of people

who could provide the needed information. It is therefore advantageous in its ability to target those perceived to have information about the topic or subject of interest. In this light, Brink (1996) argued that the purposive sampling method ensures that the data collected is very informative for the study being carried out. Brink however indicated that purposive sampling have the weakness of sampling bias. Sampling bias which is a weakness of purposive sampling would not affect the study because the use of simple random sampling as part of the sampling procedures would ensure that every respondent has the chance of being selected for the study.

In the current study, purposive sampling was used because it enabled the researcher to sample the respondents who had the characteristics that the researcher was interested in. By the observation of the researcher, the three selected government assisted senior high schools have been in operation for over fifteen years but still lack basic infrastructure and amenities. The purposive sampling procedure therefore helped in selecting these senior high schools who were suitable for the study.

In selecting the sample of teachers and students on the basis of stratas of school and gender, the stratified sampling procedure was used. Stratified sampling has been defined by Fink (1995) as a sampling method in which the population is divided into subgroups or 'strata,' and a random sample is then selected from each subgroup. Scheaffer, Mendenhall III and Ott (2006) also defined a stratified sample as a sample resulting from classification of population into mutually exclusive groups, called strata, and choosing a sample from each stratum.

Stratified sampling is advantageous in several ways. According to MacNealy (1999), by using stratified sampling, there is an attempt "to control for sampling error". Again, Ogah (2013) noted that using stratified sampling ensures that important characteristics of the population are fairly represented in the sample and left to chance. Another advantage of the stratified sampling as noted by Scheaffer et al. (2006) is that stratified random sampling has the strength of improving efficiency of sampling. Even though stratified sampling appears to be complex, it was considered appropriate in this study because the study aims at describing the events as relating to the various stratas.

After stratifying the sample, the simple random sampling was used to select the actual participants from each of the stratas for the study. Simple random sampling has been viewed by Ofori and Dampson (2011) as the type of sampling which involves a selection at random from a list of the population of research interest known as the sampling frame. Again, De-Vos (2002) posited that simple random sampling is the method of sampling where subjects are selected from the population so that all members of the population have the same probability of being chosen. Again, it is advantageous because Ofori and Dampson (2011) indicated that each person in the population has an equal chance of being selected for the study.

Regardless of the advantages, simple random sampling can be disadvantageous because according to Ogah (2013), simple random sampling is the most difficult to use. However, the simple random sampling was used because it is free from preconception and unfairness (Sidhu, 2002). The sampling with replacement method of simple random was used. In sampling with replacement, an individual selected for the sample is recorded as a

sample member and then returned to the population (replaced) before the next selection is made (Gravetter & Forzano, 2009). The disadvantage with this method is that one individual has the chance of being chosen more than once. However, anytime this happens, the individual already chosen would be put back in the sampling frame until a new individual is chosen. Gravetter and Forzano opined that the sampling with replacement method ensures that the same probability of selection is maintained throughout the selection process. In spite of the weaknesses of the simple random sampling, the researcher chose to use it because the researcher wants to ensure that there is fairness in the selection and the same probability of being selected is maintained throughout the selection process. When the selection is done at random, the probability of getting information from different categories of people is higher. This is important because the study seeks to find out the availability and state of infrastructure as perceived by the respondents. Therefore, to be able to get varied perceptions, random sampling suits the study better.

Census sampling was used to select the school administrators which include the school heads, the assistant headmasters/mistresses and the heads of department from the three senior high schools. Therefore, all the administrators were selected for the study. Census sampling is used when the entire population is very small or it is reasonable to include the entire population. It is called a census sampling because data is gathered on every member of the population. According to Farooq (2013), data collection through census method is advantageous because it gives opportunity to the investigator to have an intensive study about a problem. However, the census method can be inconvenient because it take much time and money.

Nevertheless, the census method was appropriate for the study because as in the view of Farooq (2013), there would be higher degree of accuracy in data since no other method is accurate like census method when the universe is small. Since the number of administrators in the three selected senior high schools were 24, the number was considered to be small and as such doing a census of all of them would give more accurate results.

In getting the sample for each school, the total population of each school was divided by the total population for the study and multiplied by the sample size. The values obtained became the sample size for each school. The sample distribution for the teachers and students are shown in Table 3.

Sample calculations for Teachers

Assin North SHS

$65 \div 140 \times 110 = 51$

Assin State SHS

$42 \div 140 \times 110 = 33$

Gyaase SHS

$33 \div 140 \times 110 = 26$

Sample calculations for Students

Assin North SHS

$1500 \div 2600 \times 350 = 202$

Gyaase SHS

$600 \div 2600 \times 350 = 81$

Gyaase SHS

$500 \div 2600 \times 350 = 67$

Table 3-*Sample Distribution of Teachers and Students on the Basis of School*

Name of School	**Teachers**	**Students**
Assin North SHS	51	202
Assin State SHS	34	81
Gyaase SHS	26	67
Total	**110**	**350**

Source: Researcher's Personal Calculation

Data Collection Instruments

To be able to collect data in this study, a questionnaire and a semi-structured interview guide were used. A questionnaire in the view of Best and Kahn (2006) is a set of questions dealing with a particular topic or related group of topics, given to a selected group of individuals for the purpose of gathering data on a problem under consideration. The characteristics of a good questionnaire according to Best and Kahn (1995) include tailoring the questionnaire to deal with a significant topic so that the respondent will recognise it as important enough to warrant spending time on. Again, the questionnaire has to be structured and tailored to the specific research questions in the study (Silverman, 2008).

Questionnaire as an instrument for data collection has some advantages and disadvantages. According to Leedy and Ormrod (2005) and Wolhuter, Van der Merwe, Vermeulen, and Vos (2003), questionnaires have some advantages. This includes the advantage of being affordable since it is the least expensive means of data collection. Again, questionnaires ensure anonymity and increase the researcher's chances of receiving honest responses. Further, questionnaires give sufficient time to a respondent to be able to carefully

consider questions and answers before responding and also complete questionnaires in a more stress-free way. Finally, questionnaires can be easily analysed and interpreted than data obtained from other sources, especially unwritten sources.

In terms of the disadvantages of questionnaires, Cohen, Manion, and Morrison (2003) revealed that questionnaires do not provide flexibility as in interviews and do not allow the researcher to correct misunderstandings or incorrect answers due to confusion or misinterpretation of questions. Finally, a poorly designed questionnaire can invalidate the results of the study, notwithstanding the merits of the sample, the field workers and the statistical techniques employed. In ensuring that these weaknesses do not affect the study, the respondents were given the chance to ask questions and seek clarifications about confusing items on the questionnaire before they respond to the questionnaires. Again, the supervisors of the researcher checked the items on the questionnaire to ensure that the questionnaire is properly constructed.

Questionnaires were used for this study because respondents will have the freedom to express their views without fear since confidentiality is maintained (Gay, 1992). Again, they were easy to administer to the respondents and also convenient to collect information within a short span of time (Mege, 2014). Specifically, in the context of this study, for the respondents to be able to give the responses about their perceptions without fear of who is watching them, the questionnaire was suitable for the study. This is so because respondents need the freedom to accurately show how they perceive the infrastructure situation in their schools.

On the part of interviews, Ofori and Dampson (2011) viewed them as prominent data collection strategies in qualitative research, where the interviewer initiates and controls the exchange in order to obtain relevant information. Akinade and Owolabi (2009) have also opined that interviews involve face-to-face questioning from the researcher and responses from the interviewee. Interview is a form of an oral questionnaire. The interviewee gives oral responses to the items raised instead of doing so in writing. Again, Creswell (2009) opined that in qualitative interviews, the researcher conducts face-to-face interviews with participants involve unstructured and generally open-ended questions that are few in number and intended to elicit views and opinions from the participants. A researcher-designed, semi-structured interview guide was used.

A semi-structured interview is chosen in order to allow the participants a degree of freedom to explain their thoughts and to highlight areas of particular interest (Horton, Macve & Struyven, 2011). For instance, some of the administrators might want to express how they have tried to get some infrastructure in their schools but their efforts have proved futile. In this regard, the semi-structured interview guide gave them the freedom to say as much as they want to say about the infrastructure situation in their schools. Another advantage of the semi-structured interview guide according to Atindanbila, Mwini-Nyaledzigbor, Abasimi, Benneh, and Avane (2014), is that semi-structured interviews permit participants to respond freely to questions and also enable the researcher to get participants to describe and explain situations in a way that provides rich descriptive data. Semi-structured

interview also afforded the researcher the opportunity to observe verbal and non-verbal behaviour of the interviewee.

In the view of Akinade and Owolabi (2009), to be able to successfully carry out an interview, the interviewer requires great skill otherwise the exercise will end in futility. Again, the interviewer requires a clear conception of what information is needed and therefore must distinctly outline the best sequence of questions and stimulating comments to bring out the desired responses. In being able to handle these difficulties with the use of interviews, the researcher carried out the interviews herself. Her knowledge in research methods assisted her in carrying out the interviewing successfully. Again, the researcher ensured that the kinds of questions and the order in which they are to be asked were validated by her supervisors. The researcher developed the instruments herself by considering the various research questions of the study.

Validity and Reliability of Instruments

The content validity of the instruments was checked by the supervisors. Thus, the instruments were checked to see if the content of the instrument measured what it intended to measure. My supervisors checked the content validity because in the view of Nitko (1996), expert judgment is used to provide evidence of content validity.

The data collection instrument was also pilot tested at Assin Nsuta senior high school. Assin Nsuta senior high was used because of its proximity and the similarity of characteristics with the schools selected for the main study. The pilot testing helped to establish the reliability of the instruments and also help in improving on some of the items. The reliability of the semi-structured interview guide was obtained through inter-rater reliability. Thus,

more than one rater will transcribe the interview data and the degree of consistency between the transcriptions of the various raters checked to establish the reliability. The reliability of the questionnaires were obtained by using the internal consistency method, obtaining a Cronbach alpha co-efficient of 0.74 for students' questionnaire and 0.75 for teachers' questionnaire. Thus, the instruments were deemed reliable enough for the study.

Data Collection Procedure

Before the data collection, the researcher obtained ethical clearance from the Institutional Review Board in the University of Cape Coast. After that an introductory letter was taken from the Institute of Educational Planning and Administration and taken to the heads of the selected senior high schools so as to get the permission to carry out the study. The researcher then sought the consent of the participants to be able to carry out the study and gave them the choice to decide whether to be a part of the study or not. The purpose of the study was explained to them to enable them make that choice. However, there was the likelihood of some of the respondents choosing not to be a part of the study. This did not to affect the sample of the study since the sample chosen for the study is bigger than the minimum required. The questionnaires and interview guide were all administered by the researcher in person.

A date for the interview was arranged mutually with the respondents. On each day of data collection, the researcher ensured that the respondents were comfortable with the place for the interview and then the interview was conducted. The researcher ensured that all of the interviews were carried out in a friendly and not an aggressive manner. A total of six weeks was used in collecting the data.

Ethical Considerations

Some ethical issues raised by Jackson (2003) as important for a study were considered in this study. Consent was sought from respondents before the study was carried out. The respondents were informed about the study so that they knew exactly what they were being asked to do, and the risks involved. This was done by asking the respondents for their consent before responding to the questionnaire and before the interviewing started.

Consideration was also given for anonymity and confidentiality of the respondents. Anonymity involves hiding the identity of the participants. As such, the identity of the respondents such as their names were not required. However, information like the gender, age range, class level (students) and designation (administrators) of participants were required because it was needed to supplement the main data gathered. The demographic information was necessary because the information helped the researcher know the various groups of individuals who were involved in the study. Confidentiality involves ensuring the privacy of the data collected. In this study, the information provided by participants was not shared with other people but was used solely for the academic work it is intended for. The participants were assured of confidentiality before responding to the questionnaire and before the interview started. The transcripts of the interview were also kept privately so that no individual got their hands on it.

Finally, there was participant autonomy. Autonomy refers to the freedom to decide what to do. As such, the participants were not forced to respond to the questionnaire and answer the interview questions in a way desired by the researcher. In ensuring autonomy, the respondents were made

to sit at comfortable places with a good amount of personal space, so that they could respond to the questionnaire and answer the interview questions in the way they wanted or desired. In ensuring participant autonomy, care was taken to avoid the respondents giving responses that are off tangent in relation to the objectives of the study. This was done by explaining the purpose of the study to the participants for them to understand the whole idea behind the study and then giving them the chance to ask questions or seek clarifications before participating in the study. By doing this, the respondents responded in line with the objectives of the study while keeping the originality of their views since they understood the idea behind the study.

Data Processing and Analysis

The data collection was done in two main forms including the quantitative and qualitative data. The quantitative data was collected with the use of the questionnaire while the qualitative data was collected with the use of the interview guide.

For the quantitative data, after the data collection, the responses on the questionnaire were coded and entered into the Statistical Product and Services Solution (SPSS) version 23. The analysis of the entered data was done descriptively according to the research questions of the study. Quantitative data for research questions 1 to 4 were analysed descriptively using frequencies and percentages. Descriptive statistics (frequencies and percentages) were deemed suitable for the study because it helped give quantitative descriptions for the data gathered. The frequencies and percentages made it easy to know which proportion of the respondents agreed

or disagreed to specific statements. This made the interpretation and discussion of the results easier.

For the qualitative data, the interviews were recorded with the permission of the respondents. After that the recorded data was transcribed, coded and presented in themes using thematic analysis according to the research questions. Braun and Clarke (2006) defined thematic analysis as a method for identifying, analysing, and reporting patterns (themes) within data. It minimally organises and describes your data set in (rich) detail. However, it also often goes further than this, and interprets various aspects of the research topic (Boyatzis, 1998). One of the benefits of thematic analysis is its flexibility (Braun & Clarke, 2006).

In doing the thematic analysis, the researcher surveyed the transcribed data and generated major themes in response to the research questions. The transcriptions were sent back to the respondents to ensure they are exactly what the respondents intended. The major themes were indicated and explained while backing them with some of the specific statements of the respondents. This was then finalised and supported with relevant literature from the literature review. In presenting the results, the results of the quantitative data were presented first and supported by the results of the qualitative data.

Chapter Summary

The descriptive survey design approach was used for the study. A sample of 350 students, 110 teachers and 24 administrators was selected through purposive, stratified, simple random and census sampling procedures. A questionnaire and a semi-structured interview guide were used for the study.

Pilot test was done with respondents from Assin Nsuta senior high school which was not part of the sample for the study. The reliability obtained was 0.74 for students and 0.75 for teachers. Ethical issues were also considered in the collection of the data.

The data obtained from the questionnaire were analysed descriptively according to the research questions of the study. The recorded data were transcribed, coded and presented in themes using thematic analysis according to the research questions.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The purpose of this study was to investigate the availability and state of infrastructure in rural senior high schools in the Assin North Municipality of the Central Region as perceived by the users of the infrastructure. This chapter presents the results and discussion of the analysis of the data collected.

Two-sets of questionnaire were administered to students and teachers respectively. The semi-structured interview was carried out for with 24 administrators from the three senior high schools. The administrators include school heads, the assistant headmasters/mistresses and the heads of department from the three senior high schools. The use of different instruments for data collection helped to provide in-depth data. The names of the administrators were not required and so they represented with alphabets of A, B and C referring to the three schools sampled. This was to ensure anonymity for the participants. The results of the analysis of the data obtained are presented according to the research questions of the study.

Demographic Characteristics of Respondents

The demographic characteristics of the respondents for the purposes of this study include gender, age and class level. The demographic characteristics are presented in Table 4 and 5.

Table 4-*Demographic Characteristics of Students (N=350)*

Demographic Characteristic	**Frequency (f)**	**Percentage (%)**
Gender		
Male	180	51.4
Female	170	48.6
Age		
Below 16 years	5	1.4
16-18 years	223	63.7
19 years and above	122	34.9
Class Level		
Form 2	184	52.6
Form 3	166	47.4

Source: Field Survey (2017)

Table 4 shows the demographic characteristics of the students who were involved in the study. It is shown that 180 (51.4%) of the respondents are males while 170 (48.6%) are females. In terms of the age of the respondents, 223 (63.7%) were between the ages of 16 and 18 while 122 (34.9%) were 19 years and above. Only five respondents were below 16 years of age. Finally, 184 (52.6%) of the respondents were in Form two while 166 (47.4%) were in Form three. The study did not have Form one's as part of the sample because as at the time of collecting the data, first year students were not yet admitted into senior high schools. The demographic characteristics of the students imply that the sample was fairly representative of the main population.

Table 5 presents the demographic characteristics of the teachers.

Table 5-*Demographic Characteristics of Teachers (N=110)*

Demographic Characteristic	Frequency (f)	Percentage (%)
Gender		
Male	60	54.5
Female	50	45.5
Age		
25 years and below	71	64.5
26-45 years	20	18.2
45 years and above	19	17.3

Source: Field Survey (2017)

Table 5 shows the demographic characteristics of the teachers in the study. It is shown that 60 (54.5%) of the teachers were males while 50 (45.5%) were females. In terms of age, it is shown that 71 (64.5%) were 25 years and below while 20 (18.2%) were between the ages of 26 and 45 years. Nineteen (17.3%) of the respondents were however 45 years and above. By implication, majority of the teachers in the schools sampled were younger (25 years or less) and probably had not been teaching for very long.

Results of Analysis of Main Data

The results of the analysis of the main data obtained from the questionnaires are presented according to the research questions of the study.

Research Question 1: What is the level of availability of infrastructures in rural senior high schools in the Assin North Municipality?

This research question sought to identify the infrastructures which were available in rural senior high schools in the Assin North Municipality. The research question was answered using data from both questionnaires and

semi-structured interview guide. The section of the questionnaire to answer this research question was on a scale of 'Yes=1' and 'No=2'. The data was analysed descriptively using frequencies and percentages. The results of both students and teachers are presented in Table 6.

Table 6-*Availability of Infrastructure*

Infrastructure	**Students**				**Teachers**			
	Yes		**No**		**Yes**		**No**	
	F	%	f	%	f	%	f	%
ICT Lab	106	30.3	106	30.3	30	27.3	80	72.7
Science Lab	76	21.7	76	21.7	60	54.5	50	45.5
Classrooms	193	55.1	193	55.1	84	76.4	26	23.6
Dormitories	84	24.0	84	24.0	69	62.7	41	37.3
Assembly Hall	225	64.3	225	64.3	91	82.7	19	17.3
Dining Hall	57	16.3	57	16.3	72	65.5	38	34.5
Library	46	13.1	46	13.1	60	54.5	50	45.5
School bus	284	81.1	284	81.1	81	73.6	29	26.4
Teaching & learning materials	72	20.6	72	20.6	65	59.1	45	40.9
Playing field	201	57.4	201	57.4	96	87.3	14	12.7
Lighting System	144	41.1	144	41.1	83	75.5	27	24.5
Water supply system	119	34.0	119	34.0	76	69.1	34	30.9

Source: Field Survey (2017)

Table 6 shows the responses of the students in answer to which infrastructure was available in their schools. It is shown that 81% of the

respondents indicated that school bus is available in their school. Again, 64% of the respondents indicated that Assembly Hall was available in their school.

It is also shown that about 87% of the respondents indicated that libraries were not available in their school. About 84% of the respondents also indicated that dining halls were not available in their schools. Other facilities that were indicated by most of the respondents as not being available include Teaching and learning materials (79.4%), Dormitories (76%), Science laboratory (78.3%), ICT laboratory (69.7%) and water supply infrastructure (66%). From the results, it can be implied that the facilities that were readily available in the schools were school bus and assembly hall.

In terms of the responses of the teachers, it is shown that 87% of the respondents indicated that playing field is available in their schools. Other infrastructure indicated by most of the respondents as being available include assembly hall (82.7%), classrooms (76.4%), electricity supply infrastructure (75.5%), school bus (73.6%), and ICT laboratory (72.7%). However, science laboratory was indicated by more than half of the respondents (54.5%) as not being available in their schools. The implication is that most of the teachers viewed most of the infrastructure facilities as being available in their schools.

Overall, it can be realised from the views of both students and teachers that school bus, assembly hall, playing field, classrooms, electricity supply infrastructure and science laboratory were available in the schools sampled. Even though, there were some variances in the responses of the teachers and students, the difference could be because of the different ways students and teachers perceived issues. For instance, majority of the respondents indicated that electricity and water supply infrastructure were not available while the

teachers indicated otherwise. This could be because the teachers are not with the students in their dormitories and so were not privy to the water and lighting crisis the students might be facing. The difference in their views could however be bridged by the interview data. Classrooms, Dormitories, Urinal and toilet facilities, Dining halls and science laboratories were indicated by the administrators to be available even though some of the facilities like that the science laboratories were improvised. The implication of all these is that, some facilities were available in the schools sampled, however some other facilities were improvised facilities, mostly facilities needed for practical work.

From the views of the 24 administrators interviewed, some facilities were mentioned as available in their schools. Common among these were Classrooms, Dormitories, Urinal and toilet facilities, Dining halls and science laboratories. Some of the specific quotes from the administrators include:

> *We have most of the basic infrastructure like Classrooms, Dormitories, Urinal and toilet facilities, but we do not have a fully furnished science laboratory*.
>
> - Headmaster A
>
> *We have some facilities, but for some we do not have. For instance, we have a school bus and we have classrooms but we do not have a fully established ICT laboratory.*
>
> – Assistant headmaster C
>
> *Some of the facilities in this school are classrooms and dormitories, but we do not have a library*.
>
> - Assistant Headmaster B

The findings of the current study contradict the findings of Yaduma and Moses (2005) who carried out a study on workshop and laboratory facilities in vocational training centres and technical colleges in Bauchi State, Nigeria. The study of Yaduma and Moses (2005) revealed that the schools lacked workshop and laboratory facilities making it difficult to undertake practical work. The current study found that the practical facilities were improvised ones while the study of Yaduma and Moses (2005) found that facilities for practical work were not available at all.

Similarly, the findings of the current study do not support the findings of Muazu (2003) who investigated the problems that militated against the effective implementation of technical and vocational programmes in vocational training centres in Adamawa State, Nigeria. Muazu found that the vocational training centres lacked training facilities which greatly affected students' practical work. The contradiction between the findings of the current study and these other studies could be because of the efforts of the school administrators in Ghana in providing improvised facilities. In Ghana, most school administrators make efforts to make teaching and learning easier. In doing this, they improvise most facilities that they might not have. This is why some schools might convert some classrooms and use them as science laboratories and ICT laboratories with some few equipment and apparatus.

Research Question 2: What is the current state of infrastructure available in rural senior high schools in the Assin North Municipality?

This research question sought to identify the state of infrastructure available in rural senior high schools in the Assin North Municipality as at the time of the study. The research question was answered using data from both

questionnaires and semi-structured interview guide. The section of the questionnaire was on a Likert scale of Strongly Agree, Agree, Disagree and Strongly Disagree. The respondents were required to indicate their agreement or otherwise to the statements provided on the questionnaire. The data collected was analysed descriptively using frequencies and percentages. The results are presented in Table 7 and 8.

Table 7-*Current State of Infrastructure (Responses of Students) (N=350)*

Statement	**Agree**		**Disagree**	
	f	%	F	%
Classrooms are well furnished	24	6.9	326	93.1
Classrooms are not enough	208	59.4	142	40.6
ICT laboratory is fully functional	48	13.7	302	86.3
Science laboratory is fully furnished	60	17.1	290	82.9
School buildings are too old	241	68.9	109	31.1
School buildings are almost collapsing	175	50.0	175	50.0
Electrical systems are faulty	240	68.6	110	31.4
Water supply system is not very functional	253	72.3	97	27.7
School library is not well stocked	287	82.0	63	18.0
Teaching and learning materials not adequate	281	80.3	69	19.7
School bus is in good shape	234	66.9	116	33.1
School playing field is in the right state	87	24.9	263	75.1

Source: Field Survey (2017)

Table 7 shows the responses of students to statements that reflect their view on whether specific facilities in their schools are in the right state. It is shown from the table that about 67% of the respondents agreed that the school bus is in a good shape. This was the only positive statement agreed to by majority of the respondents. Contrasting this, 93% of the respondents disagreed that classrooms were well furnished. Again, 86.3% of the respondents disagreed that the ICT laboratory is fully functional while 82.9% of the respondents also disagreed that the Science laboratory is fully furnished. There was however a divided opinion about the statement 'School buildings are almost collapsing' with 50% of the respondents indicating their agreement while the other 50% indicated their disagreement.

The findings imply that with the exception of the school bus which was in good shape, the respondents perceived the other facilities as not being in the best of states. Most of the respondents indicated that the classrooms were not well furnished.

The views of the teachers on the current state of infrastructure in the schools sampled are presented in Table 8.

Table 8-*Current State of Infrastructure (Responses of Teachers) (N=110)*

Statement	**Agree**		**Disagree**	
	f	%	F	%
Classrooms are well furnished	21	19.1	89	80.9
Classrooms are not enough	66	60.0	44	40.0
ICT laboratory is fully functional	33	30.0	77	70.0
Science laboratory is fully furnished	17	15.5	93	84.5
School buildings are too old	59	53.6	51	46.4
School buildings are almost collapsing	29	26.4	81	73.6
Electrical systems are faulty	56	50.9	54	49.1
Water supply system is not very functional	57	51.8	53	48.2
School library is not well stocked	81	73.6	29	26.4
Teaching and learning materials not adequate	87	79.1	23	20.9
School bus is in good shape	56	50.9	54	49.1
School playing field is in the right state	53	48.2	57	51.8

Source: Field Survey (2017)

Table 8 shows the state of the facilities in the schools sampled as reported by the teachers. The table shows that about 51% of the respondents agreed that the school bus in their schools is in good shape. Again, about 74% of the respondents disagreed that the classrooms are almost collapsing. This implies that the respondents viewed the classrooms as being in good state.

On the other hand, about 85% of the respondents disagreed that the science laboratory was fully furnished while another 81% of the respondents

disagreed that classrooms were well furnished. About 79% of the respondents also agreed that the teaching and learning materials were not adequate.

The findings from Table 8 imply that majority of the teachers view classrooms as being in good state along with school playing field. The same cannot be said however of the science laboratory as well as the furnishing of the classrooms.

There was a high level of consistency in the responses of the students and teachers. The main facilities that were indicated to be in good shape by the students and teachers were the school bus and the school playing field. The rest of the facilities were not in good shape. However, the respondents did not agree that the classrooms were almost collapsing even though the classrooms were not well furnished. The ICT laboratories and Science laboratories were also not fully functional. Teaching and learning materials were also not adequate.

In terms of the interview data, the administrators were asked about the state of the infrastructure in their schools and whether they were satisfied with them or not. In the first place, all the respondents indicated that they were not satisfied with the state of infrastructure in their schools because the infrastructure did not meet the required standard as expected in schools. Majority of the respondents indicated that the infrastructure did not meet the standard because in most instances, the facilities were not enough for the number of students and some of the facilities were improvised. The improvisation was done mostly because the schools did not originally have those facilities. This was the case for science laboratories, assembly halls and ICT laboratories.

Specifically, some of the statements of the administrators are:

Most of the facilities in our school are not up to how we like it… we have to improvise and convert some classrooms into science laboratory.-Assistant Headmaster A

The laboratories need upgrading, the facilities are not adequate especially the dormitories. – Headmaster B

The ICT laboratory is not up to the right standard. The computers are not adequate and so the state of infrastructure is not very good.-Head of Department C

Further, most of the administrators indicated that the facilities in their schools were old and had not undergone major maintenance or renovation. Only minor maintenance and renovation had been carried out on most of the school facilities. It is for this reason that the administrators (headmaster/headmistress) always receive complaints from both students and teachers about how the state of infrastructure affects them. Specifically, some of the statements of the respondents include:

A lot of the facilities are not adequate and not in good state. Our assembly hall for instance is an uncompleted building. Even though some of the facilities are available, they need to be renovated, like the classrooms and dormitories.-Headmaster C

Both teachers and students complain about how they are unhappy in the school. Teachers struggle to teach practical subjects like science and students have issues with dormitory facilities.-Assistant Headmaster C

The task or duty of school infrastructure management was that of the school management committee in collaboration with the administration of the school. The school management committee report to the board members of the schools who in turn manage the school facilities along with the head of the school. Overall, the headmasters or headmistresses of the schools are responsible for ensuring that school infrastructure and facilities are in the right state.

Overall, it can be indicated that the facilities in the schools sampled were not adequate, not in a good state and needed renovations. The poor state of infrastructures could be down to the poor culture of management among school authorities as well as the lack of support from the right agencies such as the ministry of education and the district assembly. The findings of the current study support the findings of Ayeni and Akinola (2008) who carried out a study on the influence of principals' leadership styles and motivation of teachers on quality assurance in secondary schools in Ondo State, Nigeria. Ayeni and Akinola found that most secondary schools did not have well-equipped and conducive facilities. In a similar vein, the findings of the current study confirm the findings of Fafunwa (2010) who showed that schools had inadequate and obsolete equipment and facilities.

In line with the findings of the study, Mwiria (2004) found that the Kenya secondary education system needs adequate facilities such as blocks of classrooms, furniture, instructional materials, libraries and other school equipment. This was because Mwiria found that there was inadequacy of facilities in schools in Kenya. Still in line with the current study's findings, Izobo-Martins et al. (2014) revealed that most public secondary school

buildings in Nigeria were in very poor and deplorable conditions. In Kenya, the study of Mege (2014) on the influence of school environmental factors on the teaching-learning process in public primary schools in Lower Nyokal division Homabay district revealed that schools have inadequate physical facilities. The finding of Mege (2014) was also confirmed by the findings of the current study. The trend of the studies implies that for most counties and places especially in Africa, school facilities were inadequate and not in the preferred state. This lays a burden on school administrators and other stakeholders to ensure that facilities are adequate and are renovated to help facilitate teaching and learning.

Research Question 3: How does the available infrastructure in rural senior high schools in the Assin North Municipality support teaching and learning?

This research question was intended to identify how infrastructure supports teaching and learning in rural senior high schools in the Assin North Municipality as at the time of the study. The research question was answered using data from both questionnaires and semi-structured interview guide. The section of the questionnaire was on a Likert scale of Strongly Agree, Agree, Disagree and Strongly Disagree. The data was analysed descriptively using frequencies and percentages. The results are presented in Table 9 and 10.

Table 9-*How Infrastructure Supports Teaching and Learning (Responses of Students) (N=350)*

Statement	**Agree**		**Disagree**	
	f	%	F	%
Make teaching easier for teachers	247	70.6	103	29.4
Boost teacher morale	222	63.4	128	36.6
Abstract concepts are easily demonstrated and taught	231	66.0	119	34.0
Learning is made easier for students	302	86.3	48	13.7
Helps school administrators manage school well	253	72.3	97	27.7
Make teachers comfortable during teaching and learning	292	83.4	58	16.6
Make it easier for students to understand what is taught	272	77.7	78	22.3
Helps students get firsthand experience on what is taught	280	80.0	70	20.0
Helps in teaching practical subjects	295	84.3	55	15.7

Source: Field Survey (2017)

Table 9 shows how infrastructure supports teaching and learning as reported by the students in the study. It is shown that 86% of the respondents agreed that learning is made easier for students when there is adequate infrastructure. About 84% of the respondents agreed that adequate infrastructure helps in teaching practical subjects. Again, it is shown that 83.4% of the respondents agreed that adequate infrastructure make teachers

comfortable during teaching and learning. Table 9 again showed that 80% agreed that adequate infrastructure helps students get firsthand experience on what is taught.

From the results, it can be implied that it was the view of majority of the respondents that adequate infrastructure makes learning easier. This is more so in practical subjects. Teachers get more comfortable and students get firsthand experience on what is taught. Overall, when the respondents were asked if infrastructure affected teaching and learning, about 81% of the respondents indicated that infrastructure affected teaching and learning. Thus, in the view of the students, infrastructure availability can affect the teaching and learning process in the schools sampled.

Table 10 presents the results of the analysis of the data obtained from the teachers regarding how infrastructure supports teaching and learning.

Table 10-*How Infrastructure Supports Teaching and Learning (Responses of Teachers) (N=110)*

Statement	**Agree**		**Disagree**	
	F	%	f	%
Make teaching easier for teachers	74	67.3	36	32.7
Boost teacher morale	84	76.4	26	23.6
Abstract concepts are easily demonstrated and taught	75	68.2	35	31.8
Learning is made easier for students	99	90.0	11	10.0
Helps school administrators manage school	87	79.1	23	20.9
Make teachers comfortable during teaching and learning	87	79.1	23	20.9
Make it easier for students to understand what is taught	69	62.7	41	37.3
Helps students get firsthand experience on what is taught	73	66.4	37	33.6
Helps in teaching practical subjects	82	74.5	28	25.5

Source: Field Survey (2017)

Table 10 shows how infrastructure supports teaching and learning in the schools sampled as reported by the teachers. It is shown that 90% of the respondents agreed that learning is made easier for students when there is adequate infrastructure. This could be because with adequacy of infrastructure like laboratories, students will have an ease in learning practical subjects. Again, 79% of the respondents each agreed that adequate infrastructure helps school administrators manage school well and make teachers comfortable during teaching and learning. This is probably because teachers will not struggle to teach when facilities are adequate and therefore there will not be many complaints against school administrators. About 76% of the respondents agreed that adequate infrastructure boost teacher morale. Teacher morale is likely to be improved when they have all the teaching and learning materials they need in the teaching process.

The implication of the findings is that majority of the teachers agreed that learning is made easier for students when infrastructure is adequate. Overall, 87% of the teachers indicated that infrastructure availability affect the teaching and learning process.

Further, the administrators who were interviewed were all in agreement that infrastructure in schools affect the teaching and learning process. This agreement was because the respondents opined that school infrastructure helps makes teaching and learning easier. For instance, science laboratories are needed to make the teaching and learning of science easier for both teachers and students. The same can be said of ICT infrastructure. In this case, the lack, inadequacy or poor state of such infrastructure make teaching and learning difficult. Overall, majority of the administrators were in

agreement that school facilities are essential for academic performance of students.

Some of the responses of the administrators are:

> *Our students struggle a bit in science courses because of the state of the science laboratory*.-Assistant Headmaster A
>
> *The teachers have difficulty teaching and encouraging students to learn since most of the required teaching and learning materials are not adequate*.
>
> -Head of Department A
>
> *School facilities are very much needed to help improve academic performance. Without these facilities, students can be affected negatively*.
>
> -Headmaster A

Since the facilities in schools affect teaching and learning, it is therefore not surprising that the administrators indicated that in the long run, the academic performance of students will be affected. Overall, it was agreed by students, teachers and administrators that infrastructure affected the teaching and learning process. The implication is that the availability and adequacy of infrastructure affect teaching and learning positively while the unavailability or inadequacy of infrastructure affects teaching and learning negatively.

Teaching and learning is made easier for both teachers and students, especially in terms of practical subjects. It is in this regard that the researcher observed that the state of ICT and science laboratories affected the teaching and learning of ICT and science subjects in the schools. In the ICT laboratory,

not every student gets access to computers and so teaching and learning was affected negatively. The science laboratory in the schools observed not being in a good state affected teaching and learning negatively.

It can be inferred from the findings that school facilities are essential and necessary to facilitate the teaching and learning process. These findings are understandable since the facilities are needed for teaching and learning, most especially in the study of practical subjects. The findings of the current study are in line with the findings of Durosaro (1998) that there was a positive relationship between good school environment and effective teaching and learning activities in secondary schools in Oyo, Nigeria. Similarly, the findings of Aderounmu et al. (2001) in Oyo state in Nigeria showed that facilities had a significant influence on the performance of students. The study of Mege (2014) also made conclusions similar to that of Aderounmu et al. (2001). Mege (2014) found that in Lower Nyokal division Homabay district, Kenya, the inadequacy of physical facilities in schools influence the teaching and learning process and ultimately ensuring a good performance among students in examinations.

Further, Adewunmi (2000) revealed that the availability of adequate number of physical facilities had significant influence on the academic performance of students. This has been confirmed by the current study's findings. The similarity among the findings implies that school facilities are essential for successful academic performance among students. It is therefore argued that it was important for adequate number of physical facilities to be provided in schools.

Research Question 4: In what ways do the availability and/or unavailability of infrastructure affect the general administration of rural senior high schools in the Assin North Municipality?

This research question sought to identify the ways availability or unavailability of infrastructure affect the general administration of rural senior high schools in the Assin North Municipality as at the time of the study. The portion of the questionnaire in answer to this research question was on a Likert scale of Strongly Agree, Agree, Disagree and Strongly Disagree. The data was analysed descriptively using frequencies and percentages. The results are presented in Table 11 and 12.

Table 11-*Ways Infrastructure Affect General Administration (Responses of Students) (N=350)*

Statement	**Agree**		**Disagree**	
	f	%	f	%
Lack of infrastructure make teachers complain a lot to administrators	294	84.0	56	16.0
Lack of infrastructure can cause indiscipline reactions from students	271	77.4	79	22.6
Lack of infrastructure makes it difficult for all school activities to take place	278	79.4	72	20.6
There is pressure on administration to get funds to provide required infrastructure	291	83.1	59	16.9
Poor performance due to lack of infrastructure	299	85.4	51	14.6
Lack of infrastructure can affect the work of the non-teaching staff	253	72.3	97	27.7
Lack of infrastructure makes overall administration in schools difficult	269	76.9	81	23.1

Source: Field Survey (2017)

Table 11 shows how infrastructure affects the general administration in the schools sampled as reported by the students. It is shown that about 85% of the respondents agreed that poor performance due to lack of infrastructure affect school administration. About 84% of the respondents agreed that the lack of infrastructure make teachers complain a lot to administrators. This affected the administration in the schools. Further, 83% of the respondents agreed that there is pressure on administration to get funds to provide required infrastructure. This pressure ultimately affected the general administration in the schools. Overall, 70% of the respondents indicated that the availability or unavailability of infrastructure in schools affect the general administration of schools. Therefore, it can be inferred that the work of school administrators can be affected by the facilities within schools

Table 12 presents the ways infrastructure affect the general administration of schools as reported by the teachers in the study.

Table 12-*Effects of Infrastructure on General Administration (Responses of Teachers) (N=110)*

Statement	Agree		Disagree	
	F	%	f	%
Lack of infrastructure make teachers complain a lot to administrators	98	89.1	12	10.9
Lack of infrastructure can cause indiscipline reactions from students	94	85.5	16	14.5
Lack of infrastructure makes it difficult for all school activities to take place	86	78.2	24	21.8
There is pressure on administration to get funds to provide required infrastructure	83	75.5	27	24.5
Poor performance due to lack of infrastructure affect school administration	87	79.1	23	20.9
Lack of infrastructure can affect the work of the non-teaching staff	86	78.2	24	21.8
Lack of infrastructure makes overall administration in schools difficult	91	82.7	19	17.3

Source: Field Survey (2017)

Table 12 shows the ways infrastructure affect the general administration of schools as reported by the teachers in the study. The table shows that 89% of the respondents agreed that lack of infrastructure make teachers complain a lot to administrators. This affects the general administration in schools. Again, about 86% of the respondents agreed that lack of infrastructure can cause indiscipline reactions from students. This ultimately affects the administration of schools. Further, about 83% of the respondents agreed that lack of infrastructure makes overall administration in schools difficult. These views are confirmed in the indication of the respondents when asked about whether infrastructure affected general administration in schools. About 92% of the respondents indicated that the availability or unavailability of infrastructure affects the general administration of schools.

In response to whether infrastructure affects the work of school administrators, all the administrators indicated that their work was affected by the state of infrastructure in the schools. The state of infrastructure puts pressure on school administration to seek for means and ways to manage the problem of school infrastructure. In this way, most of the school administrators are forced to abandon or neglect their some of their official duties and focus on the task of managing school infrastructure.

Specifically, some of the statements of the respondents include:

> *It is not easy, as the headmaster you are always forced to go the extra mile in providing facilities for the school. The pressure makes it difficult to even focus on other aspects of school management*.- Headmaster A

The state of infrastructure makes the management of the school difficult. You will always have to think ahead and plan so as to make provisions for school facilities.-Assistant Headmaster B

Since, school administrators are responsible for the management of school facilities we always have the headache of managing the facilities properly.-Headmaster C

In answering, the fourth and final research question, the findings showed that the availability or unavailability of infrastructure affected the general administration of schools. This was indicated by the views of the students, teachers and administrators. The work of the school administration is made much difficult because of the lack or inadequacy of infrastructure in their schools. The lack of infrastructure puts pressure on administrators to find ways and means to be able to provide the necessary infrastructure and in the right state. This makes the work of administrators more difficult.

The findings of the current study are in line with the findings of Durosaro (1998) who reported that even if the educational curriculum is sound and well operated while the school facilities are in disrepair and badly managed the administration of schools will be difficult. In a similar vein, the findings of the current study support the findings of Olagboye (2004) who showed that school heads should be involved in ensuring that the facilities are adequate in the school. In this regard, the availability or unavailability of facilities in school affects the work of administrators. The pressure to provide facilities coupled with the difficulty in getting the responsible authorities and agencies to help provide facilities for their schools make the work of administrators difficult.

Chapter Summary

This chapter presented the results and discussion of the study. A sample of 350 students, 110 teachers and 24 administrators were sampled from three different schools. The results of the study showed that facilities such as school bus, assembly hall, playing field, classrooms, electricity supply infrastructure and science laboratory were available in the schools sampled. Overall, it was revealed that the schools have some facilities. Some of the facilities available were however improvised.

Further, the study revealed that the facilities in the schools sampled were inadequate and those available were not in good state and needed some form of renovations. The study also showed that the availability and adequacy of infrastructure affect teaching and learning positively while the unavailability or inadequacy of infrastructure affects teaching and learning negatively. Therefore, school facilities were influential in the teaching and learning process in the schools.

Finally, the study showed that the availability or unavailability of infrastructure affected the general administration of schools. Thus, the availability or unavailability of infrastructure determine whether the work of administrators become difficult or not.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introductions

This chapter presents the summary, conclusions and recommendations of the study. Suggestions for further research are also given in this chapter.

Summary

The purpose of this study was to investigate the availability and state of infrastructure in rural senior high schools in the Assin North Municipality of the Central Region as perceived by the users of the infrastructure. The descriptive survey design approach was used for the study. A sample of 350 students, 110 teachers and 24 administrators was selected through purposive, stratified, simple random and census sampling procedures. A questionnaire and a semi-structured interview guide were used for the study. Pilot test was done with respondents from Assin Nsuta senior high school which was not part of the sample for the study. The reliability obtained was 0.77. Ethical issues were also considered in the collection of the data.

The data obtained from the questionnaire were analysed descriptively according to the research questions of the study. The recorded data were transcribed, coded and presented in themes using thematic analysis according to the research questions.

Key Findings

1. The study revealed that facilities such as school bus, assembly hall, playing field, classrooms, electricity supply infrastructure and science laboratory were available in the schools sampled. Overall, it was shown that the schools have some facilities and not all. Some of the facilities available were however improvised.
2. Again, the findings of the study showed that facilities were inadequate while some facilities were not in good state and needed renovations.
3. The study also revealed that the availability and adequacy of infrastructure affect teaching and learning positively while the unavailability or inadequacy of infrastructure affects teaching and learning negatively.
4. Finally, the study showed that the availability or unavailability of infrastructure affected the general administration of schools. Thus, the availability or unavailability of infrastructure can affect the work of school administrators.

Conclusions

From the findings of the study, the following conclusions are drawn:

1. In most rural senior high schools, most school facilities are available even though most of them might not be the standard ones but improvised ones. This implies that schools put in efforts to ensure that required school facilities are provided. In the practical sense, the government and other agencies responsible for education in Ghana might not be providing all the necessary facilities for senior high schools in rural areas.

2. The facilities in most senior high schools are not adequate, not in a good state and as such need some of renovation which might not have been done in a long time. From this, it can be concluded that a lot of attention had not been paid to the state of school facilities. This has to do most especially with rural senior high schools in the Assin North Municipality.
3. In a not surprising sense, it can be concluded that the availability and adequacy of school infrastructure can affect the teaching and learning process in senior high schools. Therefore, the facilities present in schools are an essential part of the teaching and learning system.
4. Finally, it can be concluded that school administration faces a difficult challenge in the provision and management of facilities in their schools. The school administration is seen as the people responsible for everything that goes on in schools. In this sense, the presence or otherwise of school facilities can affect the general administration of schools.

Recommendations

The following recommendations are made based on the findings of the study:

1. School administration should work alongside teachers to make improvisations for school facilities that may not be available in their schools. This would help ensure that schools have some facilities which they might not have been originally equipped with.
2. Government should respond to pleas of school administrators in rural areas to provide their schools with the necessary facilities to facilitate teaching and learning. Since the government is the major stakeholder

in the education sector, they are in the best position to help provide the schools in the rural areas with the required facilities.

3. Non-governmental organisations and other donor agencies should be encouraged by the Education Ministry in Ghana to supplement the efforts of government in the provision of adequate facilities for schools in rural areas.
4. In order to ensure that school facilities are available, adequate and in good state, traditional authorities and community leaders can support in the provision of facilities in the schools in their communities. Most of the rural schools are deemed to be the 'property' of the community in which they are found. In this sense, the traditional authorities and community leaders can help provide the schools with the required facilities.

Suggestions for Further Research

It is suggested that further research consider a comparison of senior high schools in rural areas and those in urban areas. This can help put the situation of the rural senior high schools in the right perspective as to whether the urban schools are better off or not.

REFERENCES

Adeboyeje, R. A. (2000). *A practical approach to effective utilization and maintenance of physical facilities in secondary schools*. Ondo, Nigeria: NIEPA

Adewunmi, T. B. (2000). *The influence of physical resources on pupils academic performance in Lagos State primary school*. Unpublished master's dissertation, University of Benin.

Akomolafe, C. O., & Adesua, V. O. (2015). The classroom environment: A major motivating factor towards high academic performance of senior secondary school students in South West Nigeria. *Journal of Education and Practice, 6*(34), 17-21.

Arisi, R. O. (2002). The universal basic education: problems and prospects. Refocusing education in Nigeria. In S. O. Oriaifo, P. O. E. Nwaokolo, & G. C. Igbogbor (Eds.), *Influence* (pp. 306-310). Benin City, Nigeria: Da-Sylva.

Asogwa, U. D. (2008). Integrating information and communication technology as an integral and learning tool in teacher training: A challenge for Nigerian teacher education. In B. G. Nworgu (Ed), *Education in the information age: Global challenges and enhancement strategies* (pp. 155-158). Proceeding of the first International Conference of the Faculty of Education, University of Nigeria, Nsukka, Nigeria.

Ayo, C. K. (2001). *Information technology: Trends and application in science and business*. Lagos, Nigeria: Concept Publications.

Adegun, F. O. (2001). *Problems of instructional materials in Nigerian educational institutions: The need for appropriate technologies*. Nsukka, Nigeria: NATT Publication.

Ademilua, A. A. (2002). *Factors affecting students' academic performance in some selected schools in Ekiti State*. Unpublished master's dissertation, University of Ilorin, Nigeria.

Adesina, S. (1990). *Educational management*. Enugu, Nigeria: Fourth Dimension Publishing Co. Ltd.

Ajayi, I. A., & Ayodele, J. B. (2001). *Introduction to educational planning administration and supervision*. Ado-Ekiti, Nigeria: Yemi Printing Services.

Akhihiero, E. T. (2011). Effect of inadequate infrastructural facilities on academic performance of students Of Oredo Local Government Area of Edo State. *The Nigerian Academic Forum, 20*(1), 1-6.

Akinade, E. A., & Owolabi, T. (2009). *Research methods: A pragmatic approach for social sciences, behavioural sciences and education*. Ibadan, Nigeria: Connel Publications.

Akingbade, J. O., & Falana, T. F. (n.d.). *The possible influence of school facilities on student achievement in biology in secondary schools in Akoko North East Local Government, Ondo State, Nigeria*. Unpublished Project.

Alagbu, C. N. (2003). *A comparative study of the administrative and organisation of Federal and State secondary schools in Anambra state*. Unpublished master's thesis, Ahmadu Bello University, Zaria, Nigeria.

Altbach, P. G. (1998). Gigantic peripheries: India and China in the world knowledge system. In P. G. Altbach (Ed.). *Comparative higher education knowledge: The university development* (pp. 4-10). Greenwich: Ablex.

Arrow, K. J., & Kurz, M. (1970). *Public investment: The rate of return, and optimal fiscal policy*. Baltimore: The Johns Hopkins Press.

Ary, D., Jacobs, L. C., & Razavieh, A. (2002). *Introduction to research in education* (6th ed.). Belmont, CA: Wadsworth/Thomson Learning.

Aschauer, D. A. (1989). Is public expenditure productive? *Journal of Monetary Economics, 23*, 177-200.

Ashong, G. N. K. (2010). *Challenges in the administration of rural senior high schools in the Ga-West District*. Unpublished master's dissertation, University of Cape Coast, Cape Coast.

Asiabaka, I. P. (2008). The need for effective facility management in schools in Nigeria. *New York Science Journal, 1*(2), 10-21.

Atindanbila, S., Mwini-Nyaledzigbor, P. P., Abasimi, E., Benneh, C. O., & Avane, M. A. (2014). Attitudes and practices associated with exclusive breast feeding (EBF) of nursing mothers in Bolgatanga Municipality. *International Journal of Humanities Social Sciences and Education (IJHSSE), 1*(7), 114-120.

Ayeni, A. J., & Adelabu, M. A. (2012). Improving learning infrastructure and environment for sustainable quality assurance practice in secondary schools in Ondo State, South-West, Nigeria. *International Journal of Research Studies in Education, 1*(1), 61-68.

Ayeni, A. J., & Akinola, O. B. (2008). Influence of principals' leadership styles and motivation of teachers on quality assurance in secondary schools: A case study of Ondo State. *Ife Journal of Theory and Research in Education, 2*(1&2), 162-170.

Bakari, J., Likoko, S., & Ndinyo, F. (2014). Effects of physical facilities on performance in Kenya Certificate of Secondary Examination in public schools in Bungoma South, Kenya. *International Journal of Science and Research (IJSR), 3*(8), 345-348.

Bernard, H. W. (2003). *Psychology of teaching and learning*. New York, NY: McGraw-Hill.

Bernestein, J. (2006). State of working America. In J. E. Stiglitz, *The prince of inequality: How today's divided society endangers our future*. Ithaca, NY: ILR Press.

Best, W. J., & Kahn, J. V. (1995). *Research in education*. New Delhi: Prentice-Hall of India Private Limited.

Bosah, H. O. N. (1997). Improving school plant provision and administration in Nigeria schools. In N. I. Qgbonnaya (Ed.), *Major concepts and issues in educational administration* (pp. 12-17). Onitsha, Nigeria: Cape Publications International Ltd.

Boser, U. (2015). *Shoddy school infrastructure can have a big impact on students*. Retrieved from Http://www.usnews.com/opinion/knowledge-bank/2015/06/03/better-school-infrastructure-can-boost-student-learning

Bower, J. H., & Burkett, C. W. (1999). Effects of maintenance of school physical facilities and environment on students' learning. *Educational Facility Planners, 27*(1), 28 – 29.

Boyatzis, R. E. (1998). *Transforming qualitative information: Thematic analysis and code development*. Thousand Oaks, CA: Sage.

Braun, V., & Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101.

Brink, H. (1996). *Fundamentals of research methodology for health care professionals*. Cape Town, South Africa: Juta.

Bryman, A. (2001). *Social research methods*. Oxford: Oxford University Press.

Cash, C. S. (1993). *Relationship between building condition and student achievement and behaviour in small rural Virginia high schools*. Unpublished doctoral dissertation, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.

Chan, T. C. (1996). *Environmental impact on student learning*. Retrieved on June 2017 from http://eric.ed.gov/ERICWebPortal/Home.portal.

Chandan, J. S. (1999). *Management theory and practice*. New Delhi: Vikas Publishing House. PUT. Ltd.

Chinwe, V. N. (2005). *Application of information and communication technology in serial function in University Libraries of Southern Nigeria*. Unpublished doctoral thesis, University of Nigeria, Nsukka, Nigeria.

Chuma, P. C. (2012). *Challenges affecting teaching-learning in primary schools in Kenya: A case study of Central Division Mandera East District*. Unpublished master's project, Moi University.

Cohen, L., Manion, L., & Morrison, K. (Ed.). (2003). *Research Methods in Education* (5th ed.). New York: Routledge Falmer.

Creswell, J. (2002). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Merrill Prentice Hall.

Creswell, J. W., & Plano-Clark. V. L. (2007). *Designing and conducting mixed methods research.* Thousand Oaks. CA: Sage.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative and mixed methods approaches* (3rd ed.). Los Angeles: Sage Publications Inc.

De-Vos, A. S. (2002). Scientific theory and professional research. In A. S. De-Vos, H. Strydom, C. S. L. Fouché, & C. S. L. Delport (Eds.), *Research at grass roots: For the social sciences and human service professions* (pp. 21-27) (2nd ed.) Pretoria: Van Schaik.

Dogo, B. (1997). Distribution pattern and status of educational facilities and its policy implication in rural areas of Jos, Plateau State. *The Nigerian Teachers Today, 4*(2), 16-20

Donkor, R. A. (2009). *Challenges faced by educational administrators in rural senior high schools: A case study of the Bibiani-Anhwiaso-Bekwai District of the Western Region of Ghana*. Master's Dissertation submitted to the University of Cape Coast, Cape Coast.

Durosaro, D. O. (1998). School plant management in Nigeria: Trends, issues and problems in management of Nigerian education – Project monitoring and school plant maintenance. *National Institute for Planning and Administration, 2*, 53-63.

Earthman, G. I., & Lemaster, L. (1996). *Review of research on the relationship between school building and students achievement*. Paper presented at the annual meeting of the council of the education facility planners International, Tarpan springs.

Easterly, W., & Rebelo, S. (1994). *Africa's growth tragedy: Policies and ethnic divisions*. Geneva, Switzerland: World Bank.

Edwards, M. M. (1992). *Building condition, parental involvement and student achievement in Washington DC public school system*. Unpublished doctoral dissertation, Georgetown University, Washington DC.

Eshiwani, G. S. (1993). *Factors influencing performance among primary and secondary school pupils in Western province, Nairobi Kenya*. Unpublished research report, Bureau of Educational Research, Kenyatta University.

Eze, R. (2002). *Foundations of educational technology*. Aba, Nigeria: Logicate Media Ltd.

Fafunwa, A. B. (2010). Fafunwa's last interview: Remember me as somebody who promoted use of mother tongue in schools. *The Punch, p3*.

Farooq, U. (2013). *What is census method of data collection, advantages and disadvantages*? Retrieved on October, 2016 from http://www.studylecturenotes.com/social-research-methodology/what-is-census-method-of-data-collection-advantages-disadvantages

Federal Government of Nigeria (1998). *Revised national policy on education*. Lagos, Nigeria: Author.

Fink, A. (1995). *How to sample in surveys* (Vol. 6). London: Sage Publications.

Fraenkel, J. R., & Wallen, N. E. (Ed.). (2000). *How to design and evaluate research in education* (4th ed.). Boston: McGraw-Hill Higher Education.

Frazier, L. M. (2002). *Deteriorating school facilities and student learning*. Eric Digest, Number 82. Retrieved from http://ericae.net/edo/ED356564.htm

Gay, R. L. (1992). *Educational research: Competences for analysis and application* (4th ed.). New York, NY: Macmillan Publishing Company.

Ghana Statistical Service (GSS), (2014). *2010 Population and housing census: District analytical report-Assin North Municipal*. Accra-Ghana: GSS.

Gravetter, F. J., & Forzano, L. B. (2009). *Research methods for the behavioural sciences* (3rd ed.). Wadsworth: Cengage Learning.

Hallack, J. (1990). *Investing in the future: Setting educational priorities in the developing world*. Paris, France: 1 TEP and Pergonion Press.

Hanson, E. M. (1989). *Educational administration and organization behaviour*. Boston: Allyn and Bacon Inc.

Harold, A., Kim, J., & Orazem, P. F. (2003). Design, evaluation, and sustainability of private schools for the poor: The Pakistan urban and rural fellowship school experiments. *Economics of Education Review, 22*(3), 265-274.

Heyneman, S., & Loxley, W. A. (1993). The effect of primary school quality on academic achievement across 29 high and low income countries. *The American Journal of sociology, 188*(6), 1162-1194.

Horton, J., Macve, R., & Struyven, G. (2011). *Qualitative research: Experiences in using semi- structured interviews*. Retrieved on October, 2016 from http://www.download-it.org.

Ikgbusi, N. G., & Iheanacho, R. C. (2016). Factors militating against effective administration of secondary schools in Anambra State. *World Journal of Educational Research, 3*(1), 213-226.

Ipaye, B. (2002). Teachers' apathy to teaching. *Journal of All Nigeria Conference of Principals of Secondary Schools, 2*, 185-198.

Isyaku, K. (2002). *The status of higher education in Nigeria: The college of education perspective*. A lead paper presented at the National summit on Higher Education organized by the federal Government of Nigeria at Abuja, March, 10th–16th, 2002.

Izobo-Martins, O., Dare-Abel, O., & Kunle, A.-V. (2014). Infrastructure conditions in public secondary schools, Ogun State Nigeria. *International Journal of Civil, Structural, Environmental and Infrastructure Engineering Research and Development, 4*(5), 17-24.

Jackson, W. (2003). *Methods of doing social research.* Toronto: Prentice Hall.

Jones, P. (2001). Are educated workers really more productive? *Journal of Development Economics, 64*, 67–79.

Kelley, K., Clark, B., Brown, V. & Sitzia, J. (2003). Good practice in the conduct and reporting of survey research. *International Journal for Quality in Health Care, 15*(3), 261-266.

Kern, M. (2008). *Purpose of discipline in school*. London: Routledge.

Khumalo, B., & Mji, A. (2014). Exploring educators' perceptions of the impact of poor infrastructure on learning and teaching in rural South African schools. *Mediterranean Journal of Social Sciences, 5*(20), 1521-1532.

Kilei, J. K. (2012). *Factors influencing quality training in public primary TTC in Rift Valley Zone, Kenya*. Unpublished master's project, Moi University.

Krejcie, R. V., & Morgan, D. W. (1970). Table for determining sample size from a given population. *Educational and Psychological Measurement, 30*(3), 607-610.

Leedy, D. L., & Ormrod, J. E. (2005). *Practical research: Planning and design* (8th ed.). Upper Saddle River, NJ: Merrill/Prentice Hall.

Lockwood, B., & Cornell, R. (2013). *School ICT infrastructure requirements for teaching computing*. A Computing at School (CAS) Whitepaper.

Lowe, J. M. (1990). *The interface between education facilities and learning climate*. Unpublished doctoral dissertation, A&M University, Texas.

Lumuli, N. C. (2009). *An investigation into internal efficiency measures in promotion of access and completion rates in public secondary schools in Bungoma South District.* Unpublished master's thesis, University of Nairobi.

Lyons, J. B. (2001). *Do school facilities really impact a child's education*? Retrieved from http://www.coe.uga.edu/sdpl/articlesandpapers/lyons.html

MacNealy, M. S. (1999). *Strategies for empirical research in writing*. New York, NY: Longman.

McGruffey, C. W. (1992). Facilities. In H. J. Walberg (Ed.), *Improving educational standards and productivity: The research basis for policy* (p.237-288). Berkeley, CA: McCutchan Publishing.

Mege, C. A. (2014). *Influence of school environmental factors on teaching-learning process in public primary schools in Lower Nyokal Division, Homa-Bay District, Kenya*. Unpublished master's project, University of Nairobi, Kenya.

Mojela T. W. (2013). *Assessment of the effectiveness of public schools infrastructure maintenance system in the Gauteng province*. Master's thesis, University of Johannesburg, South Africa.

Muazu, J. (2003). *Problems that militate against the effective implementation of technical and vocational programmes in vocational training centres in Adamawa State, Nigeria*. Adamawa, Nigeria: Freedom Press.

Mwiria, K. (2004). We're to blame for school unrest. *Daily Nation*, July 24.

Neuman, W. L. (2000). *Social research methods: Qualitative and quantitative approaches*. Boston: Allyn & Bacon Publishers.

Nitko, A. J. (1996). *Educational assessment of students* (3rd ed.). Englewood cliffs, NJ: Merill/ prentice Hall.

Norris, C., Sullivan, T., Poirot, J., & Soloway, E. (2003). No access, no use, and no impact: Snapshot surveys of educational technology in K-12. *Journal of Research on Technology in Education*, *36*(1), 15–27.

Ofori, R., & Dampson, D. R. (2011). *Research methods and statistics using SPSS*. Kumasi: Payless Publication Limited.

Ogah, J. K. (2013). *Decision making in research process: Companion to students and beginning researchers*. Accra: Adwinsa Publications (Gh) Ltd.

Okeke C. C. (1990). *Educational technology and primary science learning: Implications for Nigeria's technology emancipation*. Mubu: The Technology Writers Association of Nigeria.

Ola, J. R. (1990). *The place of school library in the New 6-3.3-4 educational system* (2nd ed.). Ibadan, Nigeria: Evans Brothers Publishers.

Olagboye. A. A, (1998). *Promoting school plant maintenance culture in the Nigeria school system*. Ondo, Nigeria: NIEPA.

Olagboye, A. A. (2004). *Introduction to educational administration planning and supervision*. Ikeja: Joja Educational Research and Publishers Ltd.

Olagunju, R. E. (2011). *Development of mathematical models for the maintenance of residential buildings in Niger State*. Unpublished doctoral thesis, Federal University of Technology, Minna, Nigeria.

Olatoye, R. A. (2004). *Emergent issues in enhancing the teaching and learning of science in schools: Issues in educational measurement and evaluation in Nigeria*. Ibadan, Nigeria: Institute of Education, University of Ibadan.

Olutola, A. D. (1989). Educational facilities and students' performance in West African school certificate examination. *International Journal of Educational Management, 1*(1), 17-24.

Omotoso, I. E. (1991). *The relationship between school factors and students' performance in school certificate examinations*. Lagos, Nigeria: Press.

Onyara, B. N. (2013). *School based factors influencing student's academic performance at Kenya certificate of secondary education in Teso South District*. Unpublished master's project, University of Nairobi, Kenya.

Onyejemezie, D. A. (1991). Resource development in education: Strategies for schools. In M. A. Mkpa (Ed.), *Contemporary issues in Nigerian education* (pp. 15-21). Aba: Nigeria Mekoslink publishers.

Osahon, U. G. (2001). *Facilities management in school*. Benin City, Nigeria: Mabogun Publishers.

Ostendorf, J. (2001). *Indoor air pollution threatens kids' health in schools*. Washington, DC: United States Environmental Protection Agency, Retrieved from http://www.epa.gov/Region8/air/iaq/iaq.html

Ottesen, E. (2006). Learning to teach with technology: Authoring practiced identities. *Technology, Pedagogy and Education, 15*(3), 275-290.

Owoeye, J. S., & Yara, P. O. (2010). *School facilities and academic achievement of secondary schools agricultural science in secondary schools in Ekiti state, Nigeria*. Unpublished doctoral thesis, Kampala International University, Kampala.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.

Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: Results from a worldwide educational assessment. *Computers and Education, 37*, 163–178.

Peretomode, V. F. (2003). *Introduction to educational administration, planning and supervision*. Lagos, Nigeria: Jopa Press Ltd.

Popoola, T. A. (1989). *An investigation between instructional resources and academic performance*. Unpublished master's project, University of Ilorin.

Rouse, M. (2005). *ICT (Information and Communications Technology)*. Retrieved from http://searchcio.techtarget.com/definition/ICT-information-and-communications-technology-or-technologies

Sani, D. M. (2007). *Relationship among school plant construction, utilization, maintenance and school effectiveness in Kebbi state secondary schools, Nigeria*. Unpublished doctoral thesis, University of Ilorin, Nigeria.

Sayer, A. (2000). *Realism and social science*. London: Sage.

Scheaffer, R. L., Mendenhall III, W., & Ott, R. L. (2006). *Elementary survey sampling*. Belmont, CA: Thompson Higher Education.

Schneider, M. (2002). *Do school facilities affect academic outcomes*? Washington, DC: National Clearinghouse for Educational Facilities.

Sidhu, K. S. (2002*). Methodology of research in education*. New Delhi, India: Sterling Publishers Private Limited.

Silverman, D. (2008). *Interpreting qualitative data* (3rd ed.). London: Sage.

Shohet, I. M., & Straub, A. (2013). Performance-based-maintenance: A comparative study between the Netherlands and Israel. *International Journal of Strategic Property Management, 17*(2), 199-209.

Sokpe, B. Y., Ahiatrogah, P. D., & Kpeglo, J. K. (2011). Conflict management in Colleges of Education in Ghana. *Journal of Counselling, Education and Psychology, 2*(2), 69-82.

Soyibo, K., & Nyong, G. O. E. (1984). An analysis of the school certificate Biology result of old and new secondary schools in Cross Rivers State 1978 – 1982. *Nigerian Educational Forum, 7*(2), 245–250.

Taiwo, B. M. (2000). Maintenance of school infrastructures for productivity. In E. O. Fagbamiye, & D. O. Durosaro (Eds.), *Educational productivity in Nigeria* (pp. 41-47). Ilorin, Nigeria: Haytee Press and Publishing Co.

Umeoduagu, J. N. (2000). *Resources utilization for effective teaching of science technology and mathematics in new millennium*. Proceedings of the 41st Annual Conference of the Science Teachers Association of Nigeria, pp. 38-41.

Walberg, H. J., & Thomas, S. C. (1972). Open education: An operational definition and validation in Great Britain and United States. *American Educational Research Journal, 9*, 197-208.

Williams, T. R. (2003). *Educational governance*. A paper prepared for the Panel on the Role of Government, Queen's University, Kingston, Ontario. Retrieved from http://www.lawlib.utoronto.ca/investing/reports/rp46.pdf

Wolhuter, C. C., Van Der Merwe, A., Vermeulen, A., & Vos, M. S. (2003). *Themes in comparative education*. Potchefstroom, South Africa: Keurkopie.

Yaduma, P. S., & Moses, D. (2005). A survey of some laboratory facilities in some selected vocational training centres and technical colleges in Bauchi State. *Journal of Issues in Technical Teacher Education, 2*(4), 80-90.

Zhao, Y., & Frank, K. A. (2003). Factors affecting technology uses in schools: An ecological perspective. *American Educational Research Journal, 40*(4), 807-840.

APPENDICES

APPENDIX A

STUDENTS' QUESTIONNAIRE

UNIVERSITY OF CAPE COAST

COLLEGE OF EDUCATIONAL STUDIES

INSTITUTE OF EDUCATIONAL PLANNING AND ADMINISTRATION

QUESTIONNAIRE ON AVAILABILITY AND STATE OF INSFRASTRUCTURE IN SCHOOLS

This questionnaire is designed to better understand the perception of users about infrastructure in schools. Your participation will contribute immensely to the success of the study. All information provided will be kept confidential. Please do not write your name on the questionnaire. Thank you.

Please respond to the items on the questionnaire by ticking [√] and writing where necessary.

SECTION A: BACKGROUND OR DEMOGRAPHIC DATA

1. Gender: Male ( ) Female ( )
2. Age: Below 16 years ( ) 16-18 years ( ) 19 years and above ( )
3. Class: Form 1 ( ) Form 2 ( )
   Form 3 ( )

Section B: Infrastructure Available in Schools

Infrastructures available: Please tick as many infrastructures that are available in your school

Infrastructure	Yes	No
1. ICT Lab		
2. Science Lab		
3. Classrooms		
4. Dormitories		
5. Assembly hall		
6. Dining hall		
7. Library		
8. School bus		
9. Teaching and Learning materials		
10. Playing field		
11. Electricity Supply Infrastructure		
12. Water Supply Infrastructure		

13. Any other Infrastructure available:

……...

Section C: Current State of Infrastructure in Schools

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
14. Classrooms are well furnished				
15. Classrooms are not enough				
16. ICT laboratory is fully functional				
17. Science laboratory fully furnished				
18. School buildings are too old				
19. School buildings are almost collapsing				
20. Electrical systems are faulty				
21. Water supply system is not very functional				
22. School library is not well stocked and so not functioning well				
23. Teaching and learning materials are not adequate				
24. School bus is in good				

shape				
25. School playing field is in the right state				

26. Other:

……

……

……

……

Section D: How Infrastructure affects teaching and learning

27. Does Infrastructure in schools affect teaching and learning process?

Yes ( ) No ( )

Effects of infrastructure on teaching and learning

Statement	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
28. Adequate infrastructure make teaching easier for teachers				
29. Adequate infrastructure boost teacher morale				
30. Abstract concepts are easily demonstrated and taught when infrastructure is adequate				
31. Learning is made easier for students when				

infrastructure is adequate				
32. Adequate infrastructure helps school administrators manage school well thereby affecting teaching and learning				
33. Adequate infrastructure makes teachers comfortable during teaching and learning				
34. Infrastructure makes it easier for students to understand what is taught				
35. Infrastructure helps students get firsthand experience on what is taught				
36. Infrastructure helps in teaching practical subjects				

37. Other:

……

……...……

Section D: How Availability/Unavailability of Infrastructure affects general administration

38. Does Infrastructure in schools affect general administration?

Yes ( ) No ( )

Please indicate your agreement to how infrastructure affects general administration

Effects of infrastructure availability or unavailability on general administration

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
39. Lack of infrastructure make teachers complain a lot to administrators				
40. Lack of infrastructure can cause indiscipline reactions from students which can affect administration of schools				
41. Lack of infrastructure makes it difficult for all school activities to take place affecting the administration of schools				
42. There is pressure on administration to get				

funds to provide required infrastructure				
43. Poor performance due to lack of infrastructure affect school administration				
44. Lack of infrastructure can affect the work of the non-teaching staff in the school thereby affecting school administration				
45. Lack of infrastructure makes overall administration in schools difficult				

46. Please indicate any other way that lack or inadequate infrastructure affects administration of schools:

……

…….……

……

……

47. In which ways can the infrastructure situation in your school be improved:

……

…….....……

……

……

Thank You.

APPENDIX B

TEACHERS QUESTIONNAIRE

UNIVERSITY OF CAPE COAST

COLLEGE OF EDUCATIONAL STUDIES

INSTITUTE OF EDUCATIONAL PLANNING AND ADMINISTRATION

QUESTIONNAIRE ON AVAILABILITY AND STATE OF INSFRASTRUCTURE IN SCHOOLS

This questionnaire is designed to better understand the perception of users about infrastructure in schools. Your participation will contribute immensely to the success of the study. All information provided will be kept confidential. Please do not write your name on the questionnaire. Thank you.

Please respond to the items on the questionnaire by ticking [√] and writing where necessary.

SECTION A: BACKGROUND OR DEMOGRAPHIC DATA

1. Gender: Male ( ) Female ( )
2. Age: Below 25 years ( ) 26-40 years ( ) 41 years and above ( )

Section B: Infrastructure Available in Schools

Infrastructures available: Please tick as many infrastructures that are available in your school

Infrastructure	Yes	No
48. ICT Lab		
49. Science Lab		
50. Classrooms		
51. Dormitories		
52. Assembly hall		
53. Dining hall		
54. Library		
55. School bus		
56. Teaching and Learning materials		
57. Playing field		
58. Electricity Supply Infrastructure		
59. Water Supply Infrastructure		

60. Any other Infrastructure available:

……...

Section C: Current State of Infrastructure in Schools

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
61. Classrooms are well furnished				
62. Classrooms are not enough				
63. ICT laboratory is fully functional				
64. Science laboratory fully furnished				
65. School buildings are too old				
66. School buildings are almost collapsing				
67. Electrical systems are faulty				
68. Water supply system is not very functional				
69. School library is not well stocked and so not functioning well				
70. Teaching and learning materials are not adequate				
71. School bus is in good				

shape				
72. School playing field is in the right state				

73. Other:

……

……...……

……

……

Section D: How Infrastructure affects teaching and learning

74. Does Infrastructure in schools affect teaching and learning process?

Yes ( ) No ( )

Effects of infrastructure on teaching and learning

Statement	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
75. Adequate infrastructure make teaching easier for teachers				
76. Adequate infrastructure boost teacher morale				
77. Abstract concepts are easily demonstrated and taught when infrastructure is adequate				
78. Learning is made easier for students when				

infrastructure is adequate				
79. Adequate infrastructure helps school administrators manage school well thereby affecting teaching and learning				
80. Adequate infrastructure makes teachers comfortable during teaching and learning				
81. Infrastructure makes it easier for students to understand what is taught				
82. Infrastructure helps students get firsthand experience on what is taught				
83. Infrastructure helps in teaching practical subjects				

84. Other:

……

……...……

……

……

Section D: How Availability/Unavailability of Infrastructure affects general administration

85. Does Infrastructure in schools affect general administration?

Yes ( ) No ( )

Please indicate your agreement to how infrastructure affects general administration

Effects of infrastructure availability or unavailability on general administration

Statement	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
86. Lack of infrastructure make teachers complain a lot to administrators				
87. Lack of infrastructure can cause indiscipline reactions from students which can affect administration of schools				
88. Lack of infrastructure makes it difficult for all school activities to take place affecting the				

administration of schools				
89. There is pressure on administration to get funds to provide required infrastructure				
90. Poor performance due to lack of infrastructure affect school administration				
91. Lack of infrastructure can affect the work of the non-teaching staff in the school thereby affecting school administration				
92. Lack of infrastructure makes overall administration in schools difficult				

93. Please indicate any other way that lack or inadequate infrastructure affects administration of schools:

……

…….....……

……

……

94. In which ways can the infrastructure situation in your school be improved:

……

…….....……

……

……

Thank You.

APPENDIX C

UNIVERSITY OF CAPE COAST

COLLEGE OF EDUCATIONAL STUDIES

INSTITUTE OF EDUCATIONAL PLANNING AND ADMINISTRATION

INTERVIEW GUIDE FOR ADMININSTRATORS ON AVAILABILITY AND STATE OF INSFRASTRUCTURE IN SCHOOLS

Introduction

I would like to thank you for agreeing to participate in this research study that seeks to find the availability and state of infrastructure in rural SHS in the Assin North Municipality.

This study has been sanctioned and given the approval to be carried out by the Ethical Review Board.

Rationale

This interview guide is designed to provide an understanding of the availability and state of infrastructure in rural SHS in the Assin North Municipality.

It is my hope that the information obtained from this interview session will help to identify the real situation on the grounds relating to the availability and state of infrastructure in schools and help to make recommendations for the Municipal Education Service as well as the Ghana Education Service and Ministry of Education as a whole.

The whole interview is likely to last for about 30 minutes. I would like to record this interview if you are okay with it.

Confidentiality

I assure that any information you provide during this interview will be confidential and as such the information will not be shared with any external person.

Reference will not be made to your name if any information you provide is quoted verbatim. Therefore you participation remains completely anonymous.

If you are not comfortable talking about any sensitive issue, you have the right to wave your response. At any time within the course of this interview, you can decide to stop participating and it will be okay with me.

This interview session will be recorded and transcribed. However, the information you provide will be kept in secure place that can be accessed by only myself.

Consent

There is a consent form, which by signing will confirm your personal volition to be involved in the current study. This form will kept securely and there will be no trace of it to you.

Ground rules

Before the interview starts, I would like assure you that there no wrong answers in this interview since it is not a test.

Again, this is not a monitoring operation to find out if you are performing your duty or not.

Therefore please feel free to voice out your opinion regarding the content of this interview.

Please if it will not bother you, could you put your phone on silence so that you are not unduly disturbed during this period of interview? Thank you.

1. What kinds of infrastructures do you have available in your school?
2. Are the infrastructures you have mentioned adequate?

   If Yes, what is your reason for saying that?

   If No, what is your reason for saying that?
3. In your opinion how can you describe the infrastructure in your school?
4. Do the facilities meet the appropriate standard required to facilitate teaching and learning?

   If yes, why?

   If no, why?
5. How old are the facilities in your school?
6. Do you carry out maintenance works on the facilities in your school?

   If yes, why?

   If no, why?
7. Do you have a system for managing the school facilities?

   If yes, can you describe the system?

   If no, why?
8. In your opinion, whose duty it is to manage school facilities?

   Why do you say this?
9. Does the state of infrastructure in your institution affect teaching and learning?

   If yes, can you describe how?

   If no, why?

10. Do you receive complaints from teachers and students about how the state of school facilities affects teachers and students?

    If yes, how often do you receive these complaints?

11. Can you say the performance of students depend on the school facilities available?

    If yes, why do you say that?

    If no, why do you say that?

12. Does the state of infrastructure in your school affect your work as an administrator?

    If yes, can you describe how?

    If no, why?

13. As a school administrator what have you done so far about the infrastructure in your school?

14. In your opinion what else can be done about the state of facilities in your school?

We have come to the end of the interview. I would like to thank you once again for your time and valuable insights. But before I leave, I would like to find out if there are any other issues, comments and suggestions that you would like to add.