

UNIVERSITY OF CAPE COAST

A STUDY OF SCHOOL FACILITIES MAINTENANCE AMONG BASIC
SCHOOLS IN THE CAPE COAST METROPOLIS

LINDA OSIBO

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SCHOOLS IN THE CAPE COAST METROPOLIS

BY

LINDA OSIBO

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DECLARATION

Candidate's Declaration

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

Candidate Signature Date

Name: Linda Osibo

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 by the University of Cape Coast.

Principal Supervisor's Signature Date

Name:

Co Supervisor's Signature..... Date.....

Name:

ABSTRACT

The main purpose of this study was to investigate how basic schools in the Cape Coast Metropolis maintain their school facilities. The study adopted the sequential explanatory mixed method design and mainly used questionnaire and interview. A sample of 306 respondents was used for the study and respondents were selected from 50 basic schools which were sampled out of the six circuits in the Cape Coast Metropolis, Ghana. The study revealed that the schools sampled always engaged in sweeping and weeding of school compound, repairs and cleaning of walls, windows, doors, roofing sheet and dustbins. However, the schools rarely engaged in washing and cleaning of marks and spots (graffitis) on school walls. The study also showed that most of the schools sampled had maintenance plans mainly to avoid and repair breakdown of facilities as well as replace damaged facilities. The study revealed that the main sources of funds for facilities maintenance for the basic schools were internally generated funds like PTA Levy as well as Capitation Grant. Finally, the study showed further that students are likely to learn more and achieve at higher levels if the facilities in the school are in good condition. From the results obtained, it is recommended among others that the Ministry of Education should work through the Ghana Education Service to formulate policies that can guide a well-planned system of facilities maintenance so that schools do not wait until facilities break down before repairs are made.

KEY WORDS

School facilities

School facilities maintenance

Maintenance

Maintenance plan

Inhibiting

Student achievement

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DEDICATION

This work is dedicated to my family for their encouragement and support
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CHAPTER ONE

INTRODUCTION

Facility maintenance is an issue that concerns all levels of the educational system ranging from the crèche to the tertiary levels in Ghana. While not particularly explored in Ghana, the significance of facilities maintenance to school functionality is recognised worldwide to the extent that many education departments have dedicated organisational structures or units responsible for school facilities management and maintenance. If well maintained and managed, school facilities provide conducive environments that translate into quality education. If well maintained and utilised, they can realise substantial efficiency gains in students learning achievement.

Background to the Study

School facilities maintenance is an integral part of the overall management of the school. The actualisation of the goals and objectives of education require the provision, maximum utilisation and appropriate maintenance of the facilities (Asiabaka, 2008). The frequency of maintenance depends on the purpose of the school facility. Several levels of maintenance and evaluation should be performed during the life of the school facilities (Bello & Loftness, 2010). Repeated evaluation throughout the school facility's life ensures that the facility is maintained in good repair and that it adequately houses the students and improve students' achievement (Lunenburg, 2010). To obtain current information about the problems encountered in schools and the actual practices they perform, this study sought to find out schools' commitment

regarding students' learning achievement and efficient utilisation of school facilities and their maintenance.

The educational curriculum cannot be sound and well operated with poor and badly managed school facilities (Akinsolu, 2004). He further indicated that school facilities are the entire materials which school administrators, teachers and students harness, allocate and utilise for the smooth and efficient management of any educational institution, for the main objective of bringing about effective and purposeful teaching and learning experience. In other words, Castaldi (as cited in Peretemode, 2001), concluded that school facilities are those things of education which enables a skilful teacher to achieve a level of instructional effectiveness that far exceeds what is possible when they are not provided.

Nhlapo (2006) reported that school facilities maintenance basically relates to the repair, replacement and general upkeep of physical features as found in school buildings, grounds and safety systems. Szuba and Young (2003) made the point that maintenance is concerned with ensuring safe conditions for facility users, be they learners, educators, staff, parents or guests, and is also concerned with creating a physical setting that is appropriate and adequate for learning. Facilities maintenance relates to resource integration with the emphasis on the provision of an enabling working environment (Then, 1999). To this end, Leung, Lu and Ip (2004) espoused facilities maintenance as aiming to provide end-users with a comfortable, effective and quality environment with minimum resources to enhance organisational effectiveness and improve students' learning achievement.

Tsang (1998) reported that facilities maintenance at school connotes its narrow definition of facilities repairs and upkeep against facilities maintenance having a strategic dimension covering issues like facilities design and maintenance programmes, upgrading the knowledge and skills of the workforce and deployment of tools and manpower to perform maintenance work and provide a clean and safe environment, as well as creating a physical setting that is appropriate for learning (Szuba & Young, 2003). This is perhaps the reason for the lack of knowledge of facilities maintenance concepts in Ghana. It could also explain the reason for deferred maintenance and the involvement of general workers and grounds men in maintenance functions requiring people with appropriate qualifications.

Basic education is having a significant role in the lives of children as they grow and develop. Generally, many basic schools in Ghana have inadequate facilities, even the increasing fund given by the government (Kubabom, 1993). Facility maintenance is an issue that concerns all levels of the educational system ranging from the prekindergarten to the tertiary levels. The issue of facility maintenance is haphazardly addressed at the basic education level of the educational system (Asiabaka, 2008). Repairs take place only when problems arise due to break down of the existing facility.

Availability of school facilities, therefore, enhances the effectiveness of schools as they are the basic resources that bring about good academic performance in the students. School facilities enable the teacher to accomplish his/her task as well and help the learner to learn and achieve effectively (Buckley, Schneider & Shang, 2004). Therefore, school facilities need proper attention as they have a great value in the support of teachers and students'

morale, motivation, health and plays a significant role to improve the quality of education.

An exploratory surveyor's observation of the buildings in the public institutions of Ghana reveals a rather bad state of facility management (Wuni, Agyeman-Yeboah & Boafo, 2018). The facilities in these public institutions in Ghana are either poorly maintained or managed. They further stressed that a visit to Bawku Senior High School, Bawku Technical Institute and selected basic schools explain a rather poor state of maintenance of the buildings in the schools. The poor state of maintenance of the buildings might not only be seen as a manifestation of the inability of management to perform its janitorial services (Mavalankar, Ramani, Patel & Sankar, 2005) but also puts the lives of the people habiting such structures on the line and as well showcasing a poorer facility management outlook of the schools affecting students' learning achievement. Nearly all the buildings in the two schools are either due for extensive renovation or for a general overhaul to restore them to a serviceable state to meet the standard for habitation.

The state of the buildings reveals the need to undertake major repairs and renovations to rehabilitate the buildings and facilities (Wuni et al., 2018). There is no reliable available estimate of the financially erosive impact of the poor facility management but it is safe to conclude that the effects are undesirable (Yusof, 2007). Some of the buildings in the public institutions appear to be 'death traps' and can be described as 'recipes for disaster'. The effects of poor facility management only leave nothing to be desired as it has engineered the collapse of buildings and often require that colossal sums of money are expended to right the wrongs (Jusoff, Mustapa-Syed & Adnan,

2008). It is anticipated that management of the schools are aware of the state of the buildings and yet they are negligent. However, previous research works only concentrated on either maintenance; which is only a section of facility management or on facility management challenges but a knowledge void remains regarding the real causes and effects of the poor facility management in the public institutions of Ghana.

According to Ghana News Agency (2008), Twenty School Management Committees (SMC) and Parent-Teacher Associations (PTA) from the Kwabrafoso school community in the Obuasi Municipality, had a five-day capacity building workshop on school's management and infrastructure maintenance. It was aimed at strengthening their capacity in the management of schools and builds a culture of maintenance of infrastructure needed to promote effective teaching and learning in the schools.

Since education seeks to develop the minds and character of future citizens, their abilities, skills and potentials, in order to equip them for contemporary society, school facilities have to be supplied in adequate quantities, properly and effectively managed, controlled and supervised (Uko, 2001). According to her, it is a prima-facie function of top management, down to the teaching and non-teaching staff

In educational institutions, facilities constitute essential inputs, which create a favourable learning environment, facilitate interaction and enhance achievement of educational objectives (Oyesola, 2007). In essence, the school curriculum would not be meaningful and functional if required facilities are not provided inadequate quality and quantity at appropriate times through the principal's administrative finesse (Uko & Ayuk, 2014).

It has also been reported by Kaiser (2004) that poor facility management in public institutions could be blamed on the absence of facility managers with specialised knowledge in handling buildings and special facilities. Recent studies rather suggest that the lack of facility managers in most part of Africa is because the discipline is a new concept to most countries with virtually no local institutions providing specialised training in facility management (Jusoff et al., 2008). Interestingly, Ghana has no deep-rooted institutions providing training in facility management until recently when some of the universities offered specialised diploma and degrees in facility management. Therefore, facilities in the public institutions are managed by people without basic knowledge of the short and long term negative impact maintenance on the performance of the concerned institutions and as a result do not allocate substantial funds to cater for such needs (Worthing as cited in Wuni et al., 2018).

Statement of the Problem

Poor school facility conditions negatively impact staff and students' learning achievements (Bello & Loftness, 2010). This makes school facilities maintenance very important because it ensures safe conditions for facility users, be the learners, educators, staff, parents or guests, and is also concerned with creating a physical setting that is appropriate and adequate for learning. While school maintenance programme is viewed as an activity carried out in order to prolong the life expectancy of school buildings, its furniture and equipment for normal use (Bastidas, 1998), it appears in Ghana most school facilities lack maintenance. Despite the significance of facilities maintenance to teaching and learning, basic schools in Cape Coast Metropolis do not pay much attention to facilities maintenance. A review of school facilities maintenance literature

suggests that there are no studies on how basic schools in Cape Coast Metropolis maintain their facilities.

Huge sums of money have been used to construct schools and equip them with necessary facilities, it is naturally expected that such facilities will be properly maintained. A couple of basic schools visited in Cape Coast Metropolis by the researcher shows that less is done to keep the conditions of facilities well as evident in cracked walls, broken furniture, poor lighting system, falling off doors and windows and dirty walls. Also, school facilities maintenance is confronted with numerous challenges especially at the basic schools in Cape Coast Metropolis. These challenges include lack of regular supervision and inspection on the part of head teachers and teachers, clear guidelines and resources to carry out maintenance activities. Earthman (2009) pointed out that planning is a purposeful activity that helps maintain the facility. The type of plan emphasises set actions toward predetermined goals or outcomes of facilities maintenance in the basic schools.

Poor facility maintenance in public institutions in Ghana especially public basic schools is driven by an army of challenges and factors including poor maintenance culture and the attitude of deferred maintenance; indiscipline among users of the public facilities; poor building designs without maintenance considerations; non-involvement of facility management teams at the design stage; lack of qualified facility managers; and budgetary restrictions relating to the expenditure on maintenance (Wuni et al., 2018). Furthermore, Kubabom (1993) reported that there has been little or almost no maintenance of the infrastructure in the schools resulting to the deterioration of buildings, facilities and equipment in the local communities in Ghana. However, it is not certain

what the situation is in the Cape Coast Metropolis, whether the situation is the same as the one reported by Kubabom or it is different. This calls for in-depth research to be conducted to ascertain the actual situation in Cape Coast. It is for this reason I wish to conduct this research to ascertain what the actual situation is in Cape Coast.

Purpose of the Study

The main purpose of this study is to investigate how school facilities are maintained in basic schools within the Cape Coast Metropolis.

Research Objectives

The following objectives guided the study to:

1. Evaluate facilities maintenance activities carried out by basic schools.
2. Identify plans that direct facilities maintenance activities of basic schools.
3. Explore how basic schools generate resources to maintain their facilities.
4. Examine factors inhibiting facilities maintenance activities.
5. Investigate how facilities maintenance improves students' learning achievement.

Research Questions and Hypothesis

The study focused on the following research questions and hypothesis:

Research Questions

1. What activities do headteachers and teachers in basic schools do to maintain their facilities in the Cape Coast Metropolis?
2. What plans direct headteachers and teachers' activities of facilities maintenance of basic schools in Cape Coast Metropolis?

3. How do basic schools get resources to maintain their facilities in Cape Coast Metropolis?
4. What factors inhibit school facilities maintenance of basic schools in Cape Coast Metropolis?
5. How do school facilities maintenance promote students' learning achievements of basic schools in Cape Coast Metropolis?

Research Hypothesis

H₀: Views of male teachers on school facilities maintenance activities are not significantly different from that of female teachers in Cape Coast Metropolis.

Significance of the Study

The findings of this study may provide data for top administrators at the Ministry of Education and Ghana Education Service to support and pay attention to the quality of facility's condition as a factor that might influence teaching and learning. The results of the study may justify the need for government to upgrading existing schools that are below standard, weak and outdated and institute a program of improving school facilities for all new schools.

Furthermore, the study may provide data on school facilities maintenance activities for basic schools. The findings may highlight the need for basic schools to know the plans to guide school facilities maintenance, sources of financing maintenance activities as well as factors hindering school facilities maintenance activities.

The study may also serve as a relevant source of academic reference and further research into school facilities maintenance. Lastly, it may serve as a

basis for the policy-maker and researchers in Ghana to follow-up on the effectiveness of the facility maintenance and help to improve it.

Delimitation

Since the purpose of this study was to find out school facilities maintained in basic schools and was restricted to basic schools in the Cape Coast Metropolis since Cape Coast is believed to be the hub of education in Ghana and has schools attended by students from different parts of the country. The study was restricted to only teachers and head teachers in the selected basic schools within the Metropolis since they use school facilities and better understand their pupils learning achievement. Again, although there were 78 basic schools in the Cape Coast Metropolitan Assembly at the time of conducting this study, it was confined to only 50 schools as the population for the study. The scope of the study was restricted to theories of facilities maintenance (plant value and condition assessment); school facilities and facilities maintenance activities; sources of funding maintenance activities; plans directing maintenance activities and factors inhibiting maintenance activities. Any other outside these do not come under the study.

Limitations

The study had limitations with respect to its scope and research methods. Unavailability of literature on school facilities maintenance within Cape Coast Metropolis was a problem, however it did not affect the findings as similar studies have been conducted in other parts of Ghana were reviewed. Quantitising and qualitisising data can have its own problems, difficulty to have equal skill sets in both methods especially when data were collected simultaneously, there was a great time commitment and the complexities to both

approaches were expensive. Again, interpreting conflicting results was difficult. In addition, since the interview and questionnaire were means of collecting data, issues of participants' bias could affect the quality of the data and it did not report actual conditions of school facilities. Despite these limitations the results obtained from this study were useful because the research questions were positively answered. Triangulation method was used to examine the findings.

Organisation of the Study

The rest of the thesis was organised into four parts. Chapter One discussed background to the study, statement of the problem, purpose of the study, research objectives, research questions, hypothesis, significance of the study, delimitation and limitations of the study Chapter Two provided a review of the theoretical framework that underpinned this study, school facilities maintenance, conceptual review on school facilities and empirical findings facilities maintenance. It ended with a summary of the findings from the review and its implications as far as this study was concerned. The third chapter dealt with the research design, instruments development, how reliabilities and validity of the instruments were ensured and the statistical tools used in analysing the data gathered.

Chapter Four discussed the findings from this study research question by research question as well. Chapter Five highlighted the major findings from this study, conclusions that were drawn, their implications to educational practice and recommendations made and suggestions for future research.

CHAPTER TWO

LITERATURE REVIEW

This chapter is included to provide insight, as evidenced by a review of pertinent literature, into the content of school facilities and their bearing on school improvement efforts on facility maintenance. This chapter reviewed the theoretical perspectives related to the broad concepts of school facilities and a description of the condition of Ghanaian school facilities. The examination then ensues on the concept of school facilities, school facility maintenance, planning models of school facility maintenance and factors inhibiting the maintenance of school facilities in Ghana. The review of literature then focuses on the role of funding in school facilities maintenance and the conceptual framework for the study.

Theoretical Review

School facilities designers have recently increased efforts in the elimination of environmental problems such as noise, glare, mould, poor ventilation and temperature extremes (Rydeen, 2003). Rydeen notes that architects who design healthy schools that address the aforementioned concerns decrease distractions and allow students and staff to focus on the learning process. Buildings must not only be designed to be healthy. District directorate must also maintain their facilities in an effective manner in order to provide a healthy learning environment (Kennedy, 2003b). For example, poorly maintained roofs may leak allowing moisture to enter the building and increase the growth conditions for mould. The presence of mould could cause respiratory

problems for students and teachers or even lead to the closure of the classroom or entire building (Kennedy, 2003).

The maintenance of school facilities falls within the key duties of the school head teachers, teachers and students (Lunenburg, 2010). From Lunenburg's view of facilities maintenance, head teachers need to embrace this responsibility as they gain greater control and are held more accountable. Lunenburg further stressed that ageing and deteriorating school facilities often create barriers that impede effective teaching and learning. This has resulted in escalating school infrastructure costs.

Though school facility conditions will deteriorate due to normal wear and tear and also functional and technical obsolescence, the degradation would be faster without adequate investment in facility maintenance (Bello & Loftness, 2010). This is lost facility service life. According to National Research Council (1998), once this service life is lost due to deferred maintenance, the loss is irreversible, the performance of pupils is sub-optimised, and capital renewal becomes necessary to restore the facility to a minimum level of acceptable performance.

Considering the negative impacts associated with inadequate facility maintenance and deferred maintenance, it is important to ensure allocations slated for maintenance actually serve that purpose despite other priorities (Bello & Loftness, 2010). Even a single deferral may prove to have as far-reaching and as numerous adverse effects as those earlier discussed. Accordingly, the damage due to facility maintenance deferral very likely exceeds the initial benefits. This study reviewed plant value and condition assessment theories of facilities.

Condition Assessment Theory

Deficiencies in facilities need to be assessed and then generate an estimate of the total cost to renovate and repair to an acceptable or adequate condition. This theory may also calculate future maintenance needs by assessing the remaining service life of a facility and its systems (Bello & Loftness, 2010). The methodologies in this category include the Army Installation Status Report (ISR) methodology, Beach, Carson and Keating's model, the BUILDER model, the IMPACT model, the NASA BMAR model and, the University of Virginia model (Lunenburg, 2010). In addition to utilising condition assessments to identify facility deficiencies, some of the methodologies utilise other models such as the PRV model along with cost factors to determine maintenance, renewal and repair investment needs.

Facility condition assessment is an analysis of the condition of a facility in terms of age, design, construction methods, and materials. The industry professionals who perform the assessment are typically architects and engineers, and skilled-trade technicians (Wikipedia, 2019). These professional's opinions as to the conditions observed are part of the assessment. According to Wikipedia, building diagnostics go beyond facilities condition assessment to determine solutions to the problems found and predict outcomes of the solutions. This analysis can be done by walk-through inspection, mathematical modelling or a combination of both. But the most accurate way of determining the condition requires walk-through to collect baseline data. A very common metric used in determining this stage is the Facility Condition Index (FCI) as expressed in the equation below:

Facility Condition Index (FCI)

$$= \frac{\text{Deferred Maintenance (Current Cost of Repairs)}}{\text{Replacement Value}}$$

The school facilities condition assessment of different states and counties set different FCI scores for determining the school facilities that should be replaced and not renovated (Wikipedia, 2019). Tolk (2007) and Hirai, Krause and Munson (2004) meanwhile expressed an FCI greater than 10 per cent to indicate a facility in poor condition. Using these scales mean a substantial percentage of school facilities are in poor condition and are therefore subject to possible negative effects on student achievement, student attendance, teacher performance, occupant health and safety, teacher retention and recruitment. Though school facility conditions will deteriorate due to normal wear and tear and also functional and technical obsolescence, the degradation would be faster without adequate investment in facility maintenance. This is lost facility service life. According to NRC (1998), once this service life is lost due to deferred maintenance, the loss is irreversible, performance is sub-optimised, and capital renewal becomes necessary to restore the facility to a minimum level of acceptable performance.

Plant Value Theory

The idea of head teachers embracing the responsibility of maintaining school facilities places value on the school plant is given further support considering plant value theory of facilities maintenance which determines the need for facility maintenance as a percentage of the facility value. This theory emphasises the current cost of replacing a facility with one of similar capacity and function (Barco, 1994). This accounts for the type, size and location of the

facility being considered. The theory has two main methodologies include the Plant Replacement Value (PVR) and Current Plant Value (CPV) models which utilise different approaches to determine facility value (Bello & Loftness, 2010). The theory also gives an indication that it's more effective when used on a facility by facility basis and not on an inventory of facilities.

Replacement cost is the cost of replacing the functionality and capacity of a facility. As such, the full function of each facility must be considered separately. The PRV model is the most widely used methodology for determining annual facility maintenance budgets. CPV is the original cost of a facility time-adjusted to the current year (Barco, 1994). This should also include the time-adjusted values of additions and demolitions. CPV theory indirectly accounts for facility age. The CPV theory is effective when used on an inventory of facilities (Lunenburg, 2010). The model is also widely used for determining annual facility maintenance budgets.

Conceptual Review

School Facilities

School facilities are the material resources provided for staff and students to optimise their productivity in the teaching and learning process (Castaldi, as cited in Lawanson, Anike & Tari, 2011). The chalkboard, for example, facilitates the imparting of information on the learner. School facilities also include school building e.g. classrooms, assembly halls, laboratories, workshops, libraries etc. Lawanson et al. further stressed that they also include teaching aids, chairs, tables, devices such as modern educational hardware and software in the form of magnetic tapes, films, and transparent stripes. School facilities are all the things that are needed for the effective teaching-learning

process to take place. They are designed to enhance the process of teaching. The absence of school facilities implies the non-existence of any set up that may be referred to like a school.

The realisation that the transfer of knowledge does not only take place in the four walls of the classroom from the teacher to the students but rather that learning takes place through discovery, exploration, interaction with the internal and external environment has necessitated the creative and innovative development of teaching and learning facilities that reflect these changes. Asiabaka (2008) defined school facilities as all types of buildings for academic and non-academic activities, equipment for academic and non-academic activities, areas for sports and games, landscape, farms and gardens including trees, roads and paths. Others include furniture and toilet facilities, lighting, acoustics, storage facilities and parking lot, security, transportation, ICT, cleaning materials, food services, and special facilities for the physically challenged persons.

In collaboration, Ajayi (2007) and Yusof (2007) maintained that school facilities comprise the machinery which in turn includes machines and tools used in the workshop, in addition to duplicating machines. They also pointed out that the school site, which is the landscape on which the school's permanent and non-permanent structures are built, are part of the school plant. They also included buildings, equipment, furniture, vehicles of various types, electrical fittings, books, water supply infrastructure, and accessories like playgrounds, lawns, parks and farm, as part of school plant. The writers are lending her opinion by saying that school plant is all-embracing in the fact that it comprises every single item starting from the gate of the school to the walls covering the

school compound. This should be drawn into the ears of the school children who did not know that the school ground and everything in it belongs to them and they should take good care of them.

School facilities are material resources that enhance teaching and learning thereby making the process meaningful and purposeful. According to Adeboyeje (2000) and Emetarom (2004), school facilities are the physical and spatial enablers of teaching and learning which will increase the production of results. School facilities serve as pillars of support for effective teaching and learning.

Akinsolu (2004) asserted that the educational curriculum cannot be sound and well operated with poor and badly managed school facilities. He further indicated that school facilities can be defined as the entire materials which school administrators, teachers and students harness, allocate and utilise for the smooth and efficient management of any educational institution, for the main objective of bringing about effective and purposeful teaching and learning experience. If good quality and standard of school depend largely on the provision, adequacy, management and utilisation of educational materials, the responsible bodies in each level must play their role in each function and practices.

Castaldi, as cited in Peretemode (2001), concludes that school facilities are those things of education which enables a skilful teacher to achieve a level of instructional effectiveness that far exceeds what is possible when they are not provided. The successful implementation of any educational programme depends mostly on the quality of available school facilities that are to be provided for such a programme. This is supported by the view of Adaralegbe as

cited in Abraham (2003) who posits that “the type of atmosphere required for effective learning is that consisting of better school buildings, more and better teaching facilities” (p.105).

Also, Adesina, as cited in Abraham (2003), posits that the quality of education that our children get bears direct relevance to the availability or the lack of physical facilities and overall atmosphere where the learning takes place. Also, in the words of Castaldi, as cited in Lawanson et al. (2011) indicated that “excellent school facilities and dedicated teachers are basic ingredients of good educational programme” (p. 4). The desire for educational attainment is on the high side, the consumers of education, therefore, expect the attainment of standard and quality education that will give them a sense of belonging, fulfilment and satisfaction.

Availability of School Facilities

Schools can only be what people want them to be if only proper steps are taken in the provision of all that will make teaching and learning effective (Lawanson et al., 2011). To Lawanson and his colleagues, learning cannot take place where facilities are not provided. Therefore, the provision of facilities such as building, equipment etc is of utmost importance.

It is important to note that students and indeed their teachers need a conducive environment to be able to teach and learn adequately and effectively (Lawanson et al., 2011). The school facilities, therefore, must meet the needs of the school community. Each building in the school should be ceiled to reduce the intensity of heat. They must also be constructed with a design that makes for cross ventilation. Good sanitary facilities (W.C. System) must be provided.

Classrooms must not be over-crowded and must be spacious enough for free movement (Jacobson et al., as cited in Abraham, 2003).

The school farm is another important ground of the school; it is an integral part of the school facilities. It is a part of the school compound which many people tend to ignore (Lawanson et al., 2011). Other important facilities are a standard and well-equipped library and laboratory, games facilities, equipment etc. Our school can only be what we want them to be only if proper steps are taken to plan the buildings, the grounds and in fact the general layout of schools.

Types of School Facilities

Instructional facilities

These are facilities that are specifically meant for direct teaching and learning (Lawanson et al., 2011; Ifeakor, 2000). It includes classrooms, classroom seats, laboratories, libraries, experimental equipment, chalkboard, audio-visual learning equipment, zoological gardens and experimental agricultural farms. To Lawanson et al., these facilities bear directly on the teaching-learning process and are therefore considered of prime priority among other school facilities.

Recreational facilities

These are spaces, lawns, fields, pitches and equipment for sports, games and general recreation (Lawanson et al., 2011). They further highlighted that, games and sports apart from developing specific skills also develop a good learning socio-psychological as well as the mental environment through relaxation. According to Lawanson et al., the importance and level of resources

committed to the development and provision of recreational facilities must not exceed their values in facilitating the overall goal of the educational institution.

Residential facilities

These include hostels and hostel facilities, refectory and refectory facilities, staff quarters and other associated facilities meant to provide residential convenience for staff and students (Lawanson et al., 2011).

General-purpose facilities

These are facilities that can easily be converted to uses other than those for which they are being used (Lawanson et al., 2011). Lawanson et al. indicated that such facilities in most cases are made of space facilities. There are basically two types of open space facilities namely: the developed and the undeveloped spaces. Developed Open Space are spaces used as sporting pitches, fields, lawn, school farms, access roads, parking lots and so on. In the view of Lawanson and his colleagues, their uses can easily be modified as occasion demands. The Undeveloped Open Spaces are all the land area within the legal authority of the institution which is yet to be developed into specific uses.

School Facilities Maintenance

Maintenance practice basically considers the necessary actions taken to prolong the life span of a particular resource. It does not only conserve a particular resource but also reduce maintenance cost in the long run and also prolong the safety condition of an asset. Maintenance is the ultimate form of sustainable practice. According to GNA (2008), the main goal for building or renovating schools is to promote child education at a safe studying environment.

An aspect of school management that is generally overlooked is facilities maintenance. Asiabaka (2008), maintained that school facilities

maintenance plays a pivotal role in the actualisation of educational goals and objectives by satisfying the physical and emotional needs of the staff and students. According to her, physical needs are met through the provision of safe structures, adequate sanitary facilities, a balanced visual and thermal environment, sufficient shelter space for work and play; while emotional needs are met by creating pleasant surroundings, friendly atmosphere and an inspiring environment. Supporting the need for effective management of facilities in schools, Fenker (2004) stated that it involves a planned process to ensure that the buildings and other technical systems support the proper discharge of operations and services within the school organisation.

Achoru (2015) maintained that facilities maintenance is concerned with the process by which organisations ensure that their buildings, systems and services support core operations while contributing to the achievement of their strategic objectives under stable business conditions. It focuses on matching limited resources to user needs with a view of securing higher quality, lower risks and value for money. Achoru further explained that it specifically deals with space design, construction, allocation, strategy, property asset management, maintenance and post-occupancy evaluation of premises, inventory management, value management and life-cycle costing, computerisation and office automation, management of support services. As facility managers, the principal objective is to manage the existing facilities effectively in a cost-effective manner and also ensure the smooth running of the business. It has been established that effective maintenance management of facilities requires adequate planning, foresight, monitoring and budgeting.

Bello and Loftness (2010) are of the view that, when new buildings are constructed and taken over by the appropriate authorities, practically no attention is paid to the maintenance of such buildings. Several school buildings that are over fifty years old have never undergone renovation or any form of modernisation in spite of the changes in the educational system. Facility maintenance is an issue that concerns all levels of the educational system ranging from the pre-kindergarten to the tertiary levels. Some of these facilities are architecturally obsolete and therefore cannot contribute to functional education. Maintaining the new buildings, renovating and modernising the old ones require considerable expertise and commitment of human and material resources. Changes in weather conditions and lack of maintenance culture are responsible for the ageing and deterioration of school buildings, grounds and equipment.

School managers and teachers who constantly use school facilities lack knowledge of facilities maintenance planning. Consequently, they fail to integrate facility maintenance into the management of the school. The issue of facility maintenance is haphazardly addressed at all levels of the educational system. Repairs take place only when problems arise due to break down of the existing facility. Facility maintenance entails providing a clean and safe environment for teaching and learning. It also involves the provision of adequate facilities for teaching and learning.

Types of Facilities Maintenance

Emergency maintenance

Action regarding school plant maintenance is taken only when there is an emergency situation or disaster (Ogunu, 2010). This type of maintenance is done haphazardly without a pre-determined plan. Ogunu further stressed that his approach has the fundamental weakness of being retroactive as it waits for serious maintenance problems to occur before action is taken to solve the problems. It is curative rather than preventive. This is very common in the management of school facilities in societies where maintenance culture is not well established. It takes place when a facility breaks down and urgent measures or steps had to be taken to remedy the situation (Taiwo, 2000).

In this regard, collective decision-making may not be possible because there may be limited time to bring together all the necessary individuals to make decisions. It is also expensive because due to lack of maintenance, the extent of damage may demand total replacement of the facility or high cost of repair. Ogunu highlighted that in some cases, the breakdown may cause injury or even death to staff and or students of the school. The resultant effect may be a high insurance premium or prevent the use of the facility for teaching and learning until repair had been affected (Sani, 2007). School head teachers should proactively develop and implement a facilities management plan for addressing facility needs.

Preventive maintenance

This type of theory is a well-planned pro-active and systematic maintenance approach that constantly checks and takes preventive measures before problems will arise (Ogunu, 2000). This is regarded in this paper as the

best maintenance approach. This is a type of maintenance carried out on school facilities to avoid breakdown and ensure optimal performance of the facility (Sani, 2007). He further stressed that up to date information about the facility is required to serve as a guide for the maintenance team. This theory of maintenance saves cost and time. It is usually an integral part of the management practice in societies where maintenance culture is well established. Decisions on preventive maintenance are collectively made and implemented. Preventive maintenance includes regular inspection of the buildings and immediate repair of minor damages and deterioration (Uko, 2001). This is done to avoid breakdown and to ensure optimal performance of plants and equipment and saves cost and time (Ngoka, 2003).

Routine maintenance

Sani (2007) reported that routine maintenance is carried out periodically as scheduled by the school managers. He stresses that facilities may be serviced monthly, quarterly or even annually depending on the agreed schedule. Manufacturers guide provide information on nature and maintenance intervals. School managers comply with these guides to avoid breakdown of the equipment (Taiwo, 2000).

Predictive maintenance

This theory involves the use of computer software to predict equipment failure based on age, user demand and performance measures. With the frequency of maintenance tasks specified, cost data from cost guides are then used to predict the annual funding needs (Ottoman, Nixon & Lofgren, 1999). Moreover, with the increase in sophistication of various facilities, it has become a priority to provide information enabling an environment in facility

management (Achoru, 2015). This is necessary to keep adequate records of facilities and monitor their performance. The application of computer software in this regard has made it easy to achieve effective and efficient maintenance of facilities.

Structural maintenance

Structural maintenance is carried out due to the structural needs of some plants and equipment such as refurbishing, refabricating or reshaping due to current requirements or new designs (Agyeni, as cited in Uko, 2015). Structural maintenance is needed to guarantee the long term functional stability of equipment.

Committee maintenance

This centres on giving maintenance responsibility to a constituted works committee comprising of teachers, students and supporting staff (Ogunu, 2000). The committee is in charge of fundraising, receiving complaints on damaged facilities, organising direct labour, collecting data and data on the condition of the school plant. School administrators need to delegate authority and provide necessary support to enable the committee to function effectively. The approach also helps to ensure collective responsibility.

Features for Determining Facility Maintenance Needs

Montecrecy (1985) and Tolk (2007) conducted studies to determine various models which yielded substantially different results to determine facilities maintenance needs. The facility features their factor and the extent to which they factor them play a role in this. It is imperative to account for certain facility attributes in determining the maintenance needs for individual and portfolios of facilities. National Research Council (NRC) (1990) determined

factors that can have a major influence on the appropriate level of maintenance and repair expenditures to include: building size and complexity; types of finishes; current age and condition; mechanical and electrical system technologies; telecommunication and security technologies; historic or community value; type of occupants or users; climatic severity; churn (tenancy turnover rates); criticality of role or function; ownership time horizon; labour prices; energy prices; materials prices and; distance between buildings in facility inventory.

Another study conducted by Ottoman, Nixon and Lofgren (1999), identified facility maintenance and repair cost estimating criteria utilising substantial literature review. The determined criteria included: facility replacement value, age, size, type, location, type of construction, condition, lifecycle, climate and deferral penalty cost.

It has been observed that many school heads forget to realise that they have a duty to play towards the maintenance and upkeep of school plants (Lawanson et al., 2011). Nwagwu (1998), Ani (1997) and Nwogu (1997) in their separate studies have confirmed the roles of the school administrator towards the maintenance as:

1. The identification of plants that needs repair
2. The establishment of a repair inventors
3. The establishment of a maintenance workshop
4. Renovation of dilapidated school plant.
5. Repair and redecoration of the school plant.
6. Appointment of teachers to custodial duties.

7. Instruction to students on the careful use of the school plants, preventing students from damage or defacements through writing or drawings on the walls
8. Ensuring that school plants are adequate for students' population.
9. Supervising school custodial staff
10. Providing working materials for the custodial staff allocating un-accommodated buildings where applicable to staff as residential quarters since buildings deteriorate faster when they are not in use.
11. Reporting all major parts to the government on time.
12. Teaching students to treat plants as personal properties instead of government facilities.

Stages of School Facilities Maintenance

In maintaining school facilities, there are certain stages involved (Uko, 2015). These include:

Provision of Educational Programmes

Execution of educational programmes demands that facilities are provided if success is to be achieved. The government, school proprietors, parents and other stakeholders are expected to provide for their schools and be involved in every aspect of school management facilitated by the principal. Olagboye (2004), observed that this aspect is the most neglected in school management and has led to disparity in the provision of facilities from one school to another. Khan and Igbal (2012) maintained that excellent school facilities are basic ingredients for good education programmes and basic to achieving set targets and achieving the literacy rate of a country. They stated

further that the phenomenon that some schools have surplus facilities while others lack are an indicator of poor educational planning in schools.

Utilisation of Educational Facilities

The degree to which an item is used determines its sustainability or degenerative consequences on the expertise of the school head (Adeboyeje, 2002). In maintaining facilities, and for them to meet the objectives, caution must be taken in the usage, that is, facilities must not be underutilised nor over-utilised, but optimally used. That is, maximum utilisation occurs when facilities are put into effective use in line with the primary objectives – otherwise, it would be counter-productive.

Maintenance of Educational Facilities

A major problem facing schools today is that facilities are not properly managed and maintained. The physical appearance of most schools proves and speaks volumes. Isaach and Musibau (2010) asserted that poorly maintained buildings, untidy walls, leaking roofs, overgrown compounds may suggest that education within the buildings follow the same pattern. Facilities tend to depreciate, wear and tear as soon as they are put into use.

Hence, there is a need for maintenance through repairs and servicing of the components and sustaining their working conditions and capacity. According to Adeboyeje (2002), maintenance enhances performance and durability; prevents wastage, corrects breakdown and shutdown services. Here, the head teacher's responsibility is to regularly check and recheck the available facilities and take necessary measures to prevent mal-functioning or non-functioning of a particular facility.

Improvement of Educational Facilities

Apart from depreciation, facilities tend to be outdated because of the changing needs of society, which necessitates changes in school curricula. In this respect, facilities need to be improved upon from time to time. In other words, facilities improvement is the alteration or modification of facilities to suit a new demand, new situation or new programmes (Uko, 2015). Wherever there are changes in any part of the education system, the existing facilities need modification, improvement or change. Improvement of educational facilities helps to meet the needs of specific individuals and groups within the school system. This calls for the availability of accurate information collected through facilities audit.

Facilities Audit

According to the Planning Guide for Maintaining School facilities as cited in Uko (2015), facilities audit is a comprehensive inventory of a school's facilities that provides a standard method for establishing baseline information about the components, policies and procedures of a new or existing facility. It provides information on the status of school facilities. It is carried out by assessing buildings, grounds and equipment, documenting the findings and recommending appropriate service options to increase efficiency, reduce waste, and save money. According to the guide, facilities audits are important to the educational system because they:

- i. Help educational planners, managers and staff to know available facilities, their conditions, service history, maintenance needs, cost involvement and locations.

- ii. Provide facts, action plans for maintenance and improvement of school facilities.
- iii. Establish a baseline for measuring facilities maintenance progress.
- iv. Allow for in-depth analysis of product lifecycles to occur on a routine basis that is, measuring actual life versus expected life.

School Facilities Maintenance Activities

When huge sums of money have been used to construct schools and equip them with necessary physical facilities, it is naturally expected that such facilities will be properly maintained. It will be a regrettable miscalculation if expensive school facilities that have been provided with hard-earned taxpayers' money are allowed to decay and get vandalised without reasonable efforts being made to preserve and protect them (Bello & Loftness, 2010). The school manager has the statutory responsibility of ensuring that everything possible is done to keep the school plant in good functioning condition.

Jordani (2010), on his own part stated that the functions and activities usually performed by facility management professionals are quite broad and include the following; facilities inventory management, facilities requirement programming, facilities master planning, location/layout planning, facilities drafting, facilities cost accounting, real estate strategy, facilities movement coordination, project administration and implementation, facilities purchase coordination, maintenance planning, site management and overall facilities system coordination. Worthington (as cited in Wuni et al., 2018) in his own way identified the roles of facilities maintenance activities as property management, property maintenance, space planning, office service, structured planning and management of space versus reactive and ad-hoc policy which support and

improve the effectiveness of its primary activities rather than hinder the organisations goals.

Generally, facilities maintenance involved four (4) major sectors namely;

1. Premises – includes real estate, plant and machinery, maintenance, space planning etc.
2. Support services
3. Information technology while the subsidiary sectors include infrastructural management and energy management.
4. Health and safety environmental issues (Familoni, as cited in Achoru, 2015).

However, in recent years, a heightened awareness of the facility management sector has expanded its scope to seeking new working styles and process especially in this technology-driven age (Achoru, 2015).

Effective maintenance of school facilities requires knowledge, skill and expertise in handling different facets of the school system (Uko, 2001). This then calls on the ability of the principal to set required objectives, supervise facilities usage, formulate plans for procurement and ensure actual management and supervision of available facilities to attain set goals of the school system. The head teacher as the manager of the school organisation, therefore, has the onerous task of mobilising available human resource to ensure the proper running of the school. Complimenting, Mbipom (as cited in Uko, 2015) opined that school facilities comprise the physical expression of the school curriculum in the construction, internal and external arrangements of the buildings, equipment, grounds, surroundings, general appearance which include the flower

beds, paths, orchards, shrubs, playgrounds, classrooms, assembly hall, dining hall, desks and school farms.

Uko (2001) further stated that when school facilities are considered from the point of the school plant, then one will be considering a gamut of facilities such as school furniture, science laboratories, school library, and technical workshops. Under school equipment, she listed the following:

- i) Administrative: Filing cabinets, typing machines, duplicating machines, photocopying machines, telephones, etc.
 - ii) Teaching equipment: Projectors, cameras, monitors, transparencies, etc.
 - iii) Games/Sports Equipment: Boots, footballs, tennis balls, jerseys, rackets, etc.
 - iv) General Services Equipment: Grass mower, grass cutters, catering, first aid, fire extinguishers. Also mentioned: sanitary, water supply, refuse disposal, catering services and health care delivery facilities.
- According to her, effective management of school facilities calls on the ingenuity of the principal to mobilise and facilitate the teachers, non-teaching/custodial staff and students to ensure proper management and maintenance of existing facilities.

Electrical bulbs and fluorescent tubes should be replaced when they expire. Also, electrical sockets and lamp holders, as well as the wiring, should be kept in good condition. Electric generators need to be regularly serviced to keep them functional. Earthman (2004) good lighting quality has been found to be positively related to increases in student achievement. The same study further expressed persistent poor lighting may cause not only poor student performance

but affect the eyesight of students for the rest of their lives. Through an evaluation of seventeen studies, Jago and Tanner (1999) found the consensus that appropriate lighting improves student test scores and reduces off-task behaviour. Bosch (2003) also found lighting to be one of the most important design elements for educators. Through a survey of teachers in Washington, DC, Buckley, Schneider and Shang (2004) found 21 per cent of respondents reported inadequate lighting in their schools. Additionally, where there are natural lighting systems in place, they should also be prioritised for renovation. A study of 21,000 students found schools with day-lighting to score 20 per cent higher on achievement tests than those without (Earthman, 2004). Lemasters (1997) also reported natural lighting to foster higher student achievement through a synthesis of 53 studies.

School plant landscaping needs to be maintained regularly (Castaldi, 1994). Trees, flowers and grasses that need watering should be watered and trimmed. Unwanted grasses need to be weeded or cut down for beautification and safety from snakes and mosquito prevention. School grounds and the entire school environment should be swept clean from wastes generated by animals, plants and human beings on a daily basis. Stoner, Freeman and Gilbert (1996) described the environment of an organisation as all elements relevant to its operation and they include direct and indirect action elements. According to them, school facilities constitute the major components of both direct and indirect action elements in the environment of learning. Pot-holes should be filled up and injurious objects removed in playgrounds and other parts of the school environment. Unwanted grasses and shrubs should be cut or weeded.

Refuse and sewage should be regularly disposed of in order to maintain a healthy and clean school environment (Ajayi, 2007). He further stressed that blockages in gutters should be regularly cleared. Pit latrines, toilet floors, toilet seats and wash hand basins, as well as urinary, should be regularly washed, flushed and treated with germicides. Soak ways and plumbing works should be kept in good condition to ensure that the Water Cistern toilets flush correctly and efficiently.

School buildings should also be swept, floors and furniture scrubbed of dust on a daily basis. Ajayi (2007) opined that school plant maintenance is all activities embarked upon with a view to sustaining the initial use value of the school plant. This involves sweeping of the floors, surroundings, dusting, mopping, scrubbing and so on. Kenezevich (1975) was of the view that the time it takes for a structure to become obsolete and archaic is a function of the quality of the original construction and material as well as the quality of housekeeping and maintenance. The walls should be periodically repainted to give them a fresh new look. Leaking roofs and collapsed ceiling boards should be repaired. Cracked walls and broken floors need to be re-plastered. Broken doors and windows should be re-fixed.

Facility Maintenance Tools

Maintenance Checklist

The checklist is designed to capture the routine tasks that must be performed to ensure around the clock optimal performance of facilities (Achoru, 2015). It is used in generating data on the technical condition and performance level of facilities in a given period of time. In the view of Achoru, the Checklist is mostly used to carry out preventive maintenance as observations made during

the spot checks and routine checks are corrected immediately to avert an unexpected breakdown of facilities. All information generated in the process is used to effect corrective maintenance e.g. repairs, replacement etc, thereafter, they are uploaded in the database to ensure up-to-date maintenance records at any given time.

Maintenance Frequency Schedule

This is the planned preventive maintenance schedule developed for available facilities. It indicates the maintenance activities deployed and their frequency of occurrence (Achoru, 2015). Like the checklist, the maintenance frequency schedule forestalls increasing decline of the asset value of inefficiency facilities in terms of performance. Achoru further stressed that this schedule is designed to alert the maintenance officer and other schedule officers on the activities to carry out at any particular date. It helps to prepare for activities that are not yet due. For example, it will alert the manager to notify the service provider of next service data and also helps in making provision for an alternative.

End-user fault report form/e-complaint form

This is a format designed to enable the end-user employees of an institution to report on any fault observed and passed it through the network to the maintenance officer and the facility manager for action (Achoru, 2015). The User keys in the various options indication such as the location, assets description and fault description in detail and thereafter click on the “summit” button which sends/registers the request straight into the job table in the database.

School Facilities Maintenance Plans

Planning is a purposeful activity that helps achieve something. Planning can be defined as the ordering of resources and events to achieve an agreed-upon objective Earthman (2009). This definition applies equally to individuals and the organisation. Earthman is of the view that without planning, nothing is accomplished, unless by accident. Organisations could not successfully pursue a goal without some sort of planning.

Earthman (2009) opined that plans are devised in order to accomplish certain things. Without plans, an organisation could not long continue to offer the services for which it is responsible. There are several reasons for planning, most of which centre around the idea of cooperative efforts on the part of individuals in the organisation. Random activities, on the other hand, do not accomplish important things and do not move an organisation toward some goal. Therefore, the purposes of organisational planning are the following:

1. To develop and approve acceptable goals
2. To allocate and use available resources efficiently
3. To marshal and conserve staff cooperation and input into goal efforts

School Facilities Maintenance Planning Models

Adams (1991) reported that there are two general categories of planning: rational and interactive. Rational planning is a linear process, with each segment of planning following from the preceding one. This type of planning emphasises set actions toward predetermined goals or outcomes. Rational planning has definite sequential steps through which the organisation should go in developing a plan (Earthman, 2009). This category of planning is thought of as using the top-down methodology and decision making, such as in the hierarchical

structure of the public schools. It relies heavily upon hard data and quantification methodology. Earthman highlighted that many of the problems associated with school facilities such as space allocation, physical plant construction, student projections, transportation assessment, and cost analysis are amenable to the use of a rational planning methodology.

Interactive planning seems to be the opposite of rational planning in that it lends itself best to problems that do not need a high degree of objectivity or quantifiable data. Instead, it relies on data derived through ethnographic investigation. Earthman (2009) viewed interactive planning is done through decentralised, small, face-to-face groups, and it is a team effort, as contrasted to the centralised planning groups used in rational planning. Goals in interactive planning models are not permanent but suggest directions to be discussed. The methodology used in interactive planning is suited to comprehensive and educational policy planning, most institutional planning, curriculum planning, and even resource planning, because of the fluid nature of the school organisation.

Stages in School Facilities Maintenance Plan and Implementation

The activities that come under the umbrella of school facilities maintenance, planning and administration are sequentially linked (Lawanson et al., 2011). Consequently, these activities are recognised as stages in a chain of activities. The following are stages in sequential order as suggested by Lawanson et al.:

Identification of Learning Needs

Specific educational facilities requirement of community or institution in terms of type quantity and quality needs to be properly assessed to provide

the operational guide for facilities provision (Lawanson et al., 2011). At the community level, peculiar learning needs are usually tied to people's culture, religion, occupational lifestyle and the environment. It must be recognised that the learning needs in terms of facilities are contingent on the fundamental educational objectives being pursued.

Inventory Survey

A comprehensive diagnostic inventory survey of the existing stock of educational facilities in the community or institution should be done. Inventory data has to be collected and analysed to provide information on the location, condition, age, quantity and type of existing educational facilities (Lawanson et al., 2011). This will provide the educational map or the distributional network of the existing educational facilities needed in the development of the facilities master plan.

Facilities Utilisation Analysis

Relevant utilisation indicators are required to assess the legality of utilisation of these educational facilities (Lawanson et al., 2011). Such analysis is meant to reveal areas of stress and weaknesses (i.e. under-utilisation and over-utilisation) in the existing arrangement with a view to developing facilities master plan.

Establishment of Educational Facilities Master Plan

This is a blueprint that indicates where specific educational facilities are to be provided and existing ones relocated or completely removed during an educational development phase to enhance the level of utilisation of such facilities as well as meet the educational needs of the community or the educational institution (Lawanson et al., 2011).

Site Selection and Acquisition

This is the first step in the implementation of the master plan (Lawanson et al., 2011). Professional expertise is brought into selecting and acquiring the most appropriate sites for the specific educational facilities envisaged in the master plan. Site acquisition has to do with purchasing the land, paying of compensation, getting the necessary documents that entitle the institution to the land and fencing or demarcation (Lawanson et al.).

Preparation of Educational Specifications

Each educational facility, project or programme requires specific patterns in design and implementation (Lawanson et al., 2011). The educational manager or the facility planner is therefore expected at this juncture to prepare educational specifications (i.e. a written description of the curriculum and learning experiences of a project) required for implementing each of the various educational facilities such educational specifications must contain a statement of the philosophy behind the project, the grade levels to be served, enrolment capacity as well as the specification of materials and structural requirement for erecting different types of educational structures (classroom building, laboratories etc.) and for purchase and installation of the equipment specified in the master plan. Lawson et al. opined that all specifications must, however, be in line with the ministry of education requirement and must make provision for flexibility to meet the changing needs of the institutions.

Educational Project Design

Once the educational specifications have been drawn for each project to be executed or facilities to be purchased the educational facilities or plant planner must employ the assistance of other professionals to design the projects

in line with the educational specifications (Lawanson et al., 2011). Such professionals may include architects and plant engineers.

Financing School Facilities Maintenance

An adequate fund is always a problem for managers in all organisations. The school head teacher, therefore, is not left out in this problem Asiabaka (2008). However, it is necessary for the head teacher to look for alternative means of sourcing for funds within and outside the community. Government subvention and funds from all forms of fees and levies are usually inadequate. It should be noted that buildings are very expensive to be renovated and the expenditure becomes unholy if the buildings fall into a derelict state (Yusof, 2007).

Wuni et al. (2018) indicated that even though the responsibility of repairing the dilapidated buildings becomes the responsibility of the central government, it constitutes disruptions in the capital budgeting of the concerned party. They further indicated that there are times when management will have to use part of the funds meant for other aspects of running the institutions to undertake maintenance which are products of the poor facility management. Wuni and his colleagues stressed that public basic schools in Ghana heavily rely on capitation grant, internally generated funds (IGF), non-governmental organisations (NGO's) and philanthropist to fund and maintain school facilities. Kamarazaly (2014) also found that facility maintenance in most cases involves heavy sums of money and the expenditure becomes multiplied when they fall into state disrepair which constitutes erosion in the finances of the concerned institutions.

School Facilities and Student Learning Achievement

Education contributes to children's perceptual growth and understanding of their environment. To this effect, students learning environment should be designed in a way that can provide them greater opportunity to observe and work with various materials that play an important role in their understanding of man and his environment. In such a case, school facilities maintenance is important input components of the schools' programs. Lockheed (1991) mentions that facilities maintenance are useful components of school to enhance students' achievement.

“Learning is a complex activity that puts students' motivation and physical condition to the test” (Lyons, 2002, p. 10). It has been a long-held assumption that curriculum and teaching have an impact on learning. However, it is becoming more apparent that the physical condition of our schools can influence student achievement. Earthman, Cash and Van Berkum (1996) reported that 11th-grade students in above standard buildings scored higher as measured by the Comprehensive Test of Basic Skills than did their counterparts attending class in substandard facilities. The National Priorities Project (2000) report indicates that Texas students follow the trend found in the study conducted by Earthman et al.

In a Virginia study, Cash (1993) developed research that examined the impact of various factors of building condition on student achievement in a manner that controlled for socio-economic status of the students. Specifically, Cash found that when socio-economic factors were constant, facility condition had a significant correlation with student achievement. Cash further stressed that air conditioning, the absence of graffiti, the condition of science

laboratories, locker accommodations, the condition of classroom furniture, wall colour and acoustic levels correlated with student achievement at a significant level when controlling for socio-economic status of students.

Chan (1996) conducted a similar study of the impact of physical environment on student success. This study classified 165 Georgia schools into one of three categories: Modern Learning, Obsolete Learning, or Half Modern Learning Environment. Other than building age, differences in the three categories included lighting, colour schemes, air control and acoustic levels. As one might expect, Chan found student achievement to be highest in Modern Learning Environments and lowest in Obsolete Learning Environments. Chan concluded that technologies and adaptabilities of modern environments better-equipped students for success and that to ignore that fact was to disregard the physical difficulties of learning.

There are serious negative consequences for students when school facilities are not properly managed. First in the ranking is poor academic performance. There is a nexus between learning and facilities, as availability and good condition will exude academic excellence (Danesty, as cited in Uko, 2015). Oftentimes, in Ghana, parents' preference of schools for their wards are informed by the quality of facilities. Schools run the risk of losing students to other well-equipped institutions when their schools lack the required facilities or available facilities are not properly managed (Dike, as cited in Uko).

Also, if facilities are poorly maintained, this could lead to health and sanitary condition problems. For instance, if the toilets are broken down and students defecate indiscriminately, epidemics and other contagious diseases may occur to endanger not only the lives of the students but also of the staff, the

immediate neighbourhood and the nation at large (Oladipo & Oni, as cited in Uko, 2015).

Factors Inhibiting Facilities Maintenance Activities

The existence of poor facility maintenance cannot be said to be a natural problem and certainly has been driven by a number of factors. These factors can be noticed in several aspects of an organisation set up which might be stemmed from a number of negligent attitudes on the part of management. A study conducted by Jusoff, Syed, Bin and Adnan (2008) in Malaysia brought to the fore that poor facility management can be traced to low priority placed by an organisation on facility management. The researchers established that facility management is not considered as a major component of overall management due to the inability of management to appreciate and recognise the importance of undertaking all-inclusive facility management as part of an organisation's core functions.

Lack of Professional and Technical Expertise

The researchers also opined that poor facility management in Malaysia is pervasive because of the lack of local professionals with technical knowledge and specialised training in conducting facility management. Similarly, Yusof (2007) identified that the failure of organisations to make facility management one of the top priorities coupled with the lack of professionals with technical expertise in the area is the greatest recipe for the poor facility management in Africa. Keith as cited in Wuni et al. (2018) also established that lack of facility management professionals is a cause of poor facility management and indicated that facility management is a new discipline in most part of the developing world with fewer institutions training professionals in that regard. Pretty much

the same is evidenced in Ghana since facility management is yet to be introduced in the traditional and technical universities as well the various levels of education (Wuni et al., 2018). The absence of ready local expertise to timely responses to the poor state of repairs is considered a major reason for poor facility management.

Ineffective Regulatory Maintenance Associations

Jusoff, Syed, Bin & Adnan (2008) also identified that poor facility management is prevalent because most institutions do not have comprehensive management guides to regulate the conduct of facility management services and described facility management in Malaysia as ‘not having standardised practice and implementation mechanisms. They identified that poor facility management in Malaysia can be traced to the non-existence of regulative facility management association which monitors the practice of facility management by property management consultants in Malaysia. This claim by the researchers might survive in Malaysia but in Ghana, there are disciplines with well-established associations regulating their practices and yet their services and products are still performing below expectation (Wuni et al., 2018).

Inadequate Funds

Yusof (2007) identified that a major cause of poor facility management can be attributed to insufficient funds and human resources (technical expertise) in the form of lack of facility managers for some organisations. This asseveration is, however, context-specific because organisations including institutions that train property experts have been known to have poor building outlook which are conspicuous signs of poor facility management.

Similarly, it has been corroborated and validated by Kamarazaly et al. (2013) that inadequate funding and technical expertise is the greatest recipe for poor facility management among public institutions. They posited that even if a public institution has a designated in-house facility manager and there are insufficient funds to undertake timely response to facility management demands, poor maintenance and poor facility outlook is to be expected. Budget restrictions on the amount to be expended on maintenance, lack of property maintenance knowledge by facility managers and the attitude of deferred maintenance by facility owners and managers have also been identified as some of the causes of poor facility management among institutions (Keith as cited in Wuni et al., 2018). This is rather most applicable in the Ghanaian situation because the institutions that train property professionals are few comprising two universities and a polytechnic. These professionals are employed in other institutions and consequently, fewer professionals would be available for employment as quasi-facility managers in the rather many public institutions.

Poor Building Design and Construction

Waziri (2016) opined that poor building design and constructions expose building to excessive demands for unplanned maintenance which contributes greatly to poor facility management in most public institutions. This mixed design study conducted in Nigeria using questionnaires revealed that even at the advent of the current technological advancement, maintenance of buildings is not factored into the building design and construction stage rendering them susceptible to frequent faults and damages; and the inability of management of such buildings to routinely respond to these maintenance concerns translates into the poor facility management in Nigeria. Similarly,

earlier studies by Adejimi and Chohan as cited in Wuni et al. (2018) also established that poor facility management in public institution could be attributed to the inability of construction professionals to incorporate maintenance and facility management at the design and construction stage of a building life cycle. These defects at the design stage are also mostly preceded by poor constructions and the result is a frequent breakdown of facilities during post-occupancy surveys (Adejimi as cited in Wuni et al., 2018).

A Low Priority in Capital Budgeting

Wordsworth as cited Wuni et al. (2018) rather identified that maintenance as part of facility management is given a lower priority in capital budgeting and to a great extent some institutions have no funds earmarked for maintenance, repairs and major renovations. Similarly, Hinks (2004) re-echoed that most public institutions do not earmark funds for maintenance and facility management because maintenance activities are viewed as ‘responsive’, discretionary and hence deferrable. The results of this low priority on maintenance have manifested in poor facility management. Blair (2004) also observed that poor facility management could be traced to inadequate facility management planning and funding. Most institutions defer maintenance until further deterioration and the nature of weather elements in tropical Africa rather speed up the decay and deterioration of the facilities. When this derelict state of repairs is accompanied by long-deferred maintenance, poor facility management outlook is expected (Weidner, 1999). It was also established that some organisations rather place emphasis on the future capital needs of their movable assets and without similar planning for facilities (non-current asset) leading to poor facility management in public institutions. This particular with

those who see facility management to be more skewed to the management of physical workplace with a greater emphasis on the human resource than the buildings and infrastructure (Woodward, 2002; Blair, 2004).

Inadequate Planning

Blair (2004) also observed that poor facility management could be traced to inadequate facility management planning and funding. Most institutions defer maintenance until further deterioration and the nature of weather elements in tropical Africa rather speed up the decay and deterioration of the facilities. When this derelict state of repairs is accompanied by long-deferred maintenance, poor facility management outlook is expected (Weidner, 1999). It was also established that some organisations rather place emphasis on the future capital needs of their movable assets and without similar planning for facilities (non-current asset) leading to poor facility management in public institutions.

Good Leadership

Facilities cannot manage themselves except there is good leadership that will set the ball rolling (Amanchukwu & Nwachukwu, 2015). Amanchukwu and Nwachukwu maintained that, leadership, whether in the primary, secondary schools and tertiary institutions, has a vital role to play in the maintenance of the school plant. Ministry workers do not stay in educational institutions on a daily basis in order to dictate what is going wrong or right with the school plant. The school authorities should be more concerned about what the students' needs are at their developmental stages and instructional levels. The students should be properly accommodated in their various classrooms and adequate facilities and equipment provided for their effective learning. Facilities and Equipment

should be for both indoor and outdoor learning so as to cater to the overall development of the learner. Those facilities and equipment should be properly maintained for them to render their services always, physically, mentally, emotionally, socially and others.

Kenezevich (1975) emphasised that “the physical needs are met through provision of safe structure, adequate sanitary facilities, a balanced visual environment, appropriate thermal environment and sufficient shelter space for work and play” (p. 563). The learner’s emotional needs are met by creating pleasant surroundings, a friendly atmosphere and an inspiring environment. The head of an institution should make it a point of duty to appoint people whose task it is to check all these facilities and equipment and submit their report to the authorities for adequate attention. In that case, maintenance culture should be part and parcel of institutions of learning in Ghana.

Empirical Review of School Facilities

Bowers and Burkett (1987) examined the relationship between the school physical environmental conditions and student achievement to determine if student learning, performance, and achievement might be directly affected by the conditions of the school building. From rural Tennessee county school systems, they selected two elementary schools, one new and the other old for the study. These two elementary schools served grades kindergarten through eight. The modern school which had 758 students during the 1983-84 school year, contained fluorescent lighting, electric heat, and air conditioning.

In addition, the acoustics, colour schemes, and furniture in this school blended into the physical environment. The older school, built in 1939, with an addition added in 1950 housed 584 students. The older school building had

fluorescent lighting, a coal-fired furnace, and several air-conditioning units. There were no efforts made to control the acoustics, coordinate colours, and replace outdated furniture. Two hundred eighty students from fourth and sixth grades in the two schools were tested during the 1986-87 school year. The scores from these tests were used to determine the degrees of difference between students achievement in these settings. In order to find out if there were differences between achievement test scores for the two groups, Bowers and Burkett used ANOVA and the t-test.

A new research approach focusing on the relationship between the building condition and student achievement has emerged after the study Edwards conducted in 1991 (Al-Enezi, 2002). Edwards sought a relationship between the condition of the school building and student achievement. Her study of schools in the District of Columbia found that after controlling for students' socioeconomic status, students' standardised achievement scores were lower in schools in poor condition than those of students attending schools in excellent condition. According to Edwards (as cited in Al-Enezi, 2002), academic achievement of students in poor school buildings was 5.45% points below that of students in schools in fair condition and 10.9% points below that of students in schools in excellent condition. She concluded that educational building conditions were hampering student achievement and estimated that improved facilities could lead to a 5.5% to 11% improvement on standardised tests. These findings indicate that the proper learning environment would have the features of a new building that are associated with higher student achievement. In contrast, because proper conditions are not available in old

school buildings, the function of the schools as environments for learning seems to be compromised.

The relationship between school facilities condition and student achievement was not given attention in the past, but this has been changing (Edwards as cited in Al-Enezi, 2002). More and intensive efforts have been made to study this relationship. Most of the methodology design of the above-mentioned research studies correlate with nature. It has been designed to determine the type and degree of relationships that exist between each of the independent variables, the school building conditions, and the dependent variables, student academic achievement and student behaviour.

Cash's study (1993) was the first study that dealt merely with the overall building conditions. Cash examined the relationship between the condition of school facilities and student achievement and behaviour. Her study used the entire population of small, rural high schools in Virginia. More specifically, the sample was 47 schools in 36 school divisions in Virginia, which had a population of fewer than 100 seniors in the 1991-92 school year and were located outside urban areas. Building condition was determined by the Commonwealth Assessment of Physical Environment (CAPE), which was completed by personnel in the divisions of these 47 schools.

Cash (1993) divided school building conditions into two categories: structural conditions and cosmetic conditions. Structural conditions related to physical features of the school buildings, such as air conditioning, the presence of windows, lighting, and conditions of lockers, while the cosmetic conditions related to aesthetic aspects, such as recent painting, the presence of graffiti, and cleanliness.

Three comparisons were made with student achievement scores. According to Cash, student achievement scores were compared to all items on the CAPE to generate an overall building condition category. Schools were rated as being in substandard condition, standard condition, and above standard condition. Students' mean scores were compared across these three conditions (Cash, 1993). It was found that students' scores in writing were lower for substandard building conditions than above-standard building conditions. Cash found that the student achievement scores were higher in schools with better building conditions.

Hines' (1996) study of large urban high schools in Virginia also found a positive relationship between building condition and student achievement. This study, however, should be reviewed with caution due to the problems apparent in the way school buildings were classified as substandard, standard, and above standard, as it was done in the Cash's study. This study examined the relationship between the condition of school facilities and student achievement and behaviour in selected high schools in urban areas of Virginia. Building condition was determined by the Commonwealth Assessment of Physical Environment, which was completed by personnel in the divisions of the 88 schools in the population. Student achievement was determined by the scale scores of the test of Academic Proficiency for grade eleven during the 1992-1993 school year. Student behaviour was determined by the ratio of the number of expulsions, suspensions, and violence or substance abuse incidents to the number of students in each school. All achievement scores were adjusted for socioeconomic status by using the percentage of students in the free and reduced

lunch program for each school. This study found that student achievement scores were higher in schools with better building conditions.

From the literature, a lot of attitudinal studies have been carried out which includes among others; Earthman (2002) in his studies concerning school facilities conditions and students' achievement showed that the condition of school facilities has an important impact on student performance and teacher effectiveness. In particular, research demonstrates that comfortable classroom temperature and noise level are very important to efficient student performance. A number of studies (Earthman, 2002; Brooks & Atkin, 2002) have measured overall building condition and its connection to student performance; these have consistently shown that students attending schools in better condition outperform students in substandard buildings by several percentage points. School building conditions also influence teacher effectiveness. Teachers report that physical improvements greatly enhance the teaching environment.

Al-Enezi (2002) explored the relationship between school facilities and the academic achievement of twelfth students in selected public high schools in Kuwait. The population of the study was 56 high schools (28 boys' schools and 28 girls' schools). His revealed that a positive significant relationship exists between student achievement scores and school facilities conditions in the schools. Also, the study found out that building conditions affect significantly the achievement of students.

Wuni et al. (2018) in their studies at two public second cycle schools in the Upper East Region of Ghana, reported that facilities in the public institutions of Ghana are poorly managed and side-lined in the financial planning and capital budgeting of most public institutions in Ghana. There exist dilapidated

buildings and facilities in nearly all the public institutions of Ghana and the reasons behind such a negligent attitude have not received an empirical examination. These teachers reported that the empirical causes of poor facility management include lack of professional managers, the attitude of deferred maintenance, the budgetary limit on maintenance expenditure, side-lined in the financial planning and capital budgeting of institutions, and non-privy of facility management staff to the building design and construction stage. It was also established that poor facility management is characterised by a plethora of consequences including recipe for disaster, financial erosion of institution, malfunctioning and abandonment of buildings.

Asiabaka (2008) in her study, reported that the actualisation of the goals and objectives of education require the provision, maximum utilisation and appropriate maintenance of the school facilities. The paper describes the concept, nature, types of school facilities, need for facilities in schools and facility management problems. It also suggested methodologies for facilities management and concluded that school facilities give meaning to the teaching and learning process. Furthermore, advances in technology, necessitate that the school head teachers adopt modern methods of facilities maintenance.

Studies have shown that a close relationship exists between the school facilities and the academic performance of students. Nwagwu (1978) and Ogusanju maintained that the quality of education that children receive bears direct relevance to the availability or lack, thereof of physical facilities and overall atmosphere in which learning takes place. If the physical facilities are in short supply teachers would not be equipped to carry out their duties effectively,

hence quality learning would not be expected. One can see that quality learning cannot be overemphasised.

Xaba (2012) analysed school facilities maintenance, a school governance function in South Africa. Qualitative interviews were conducted with 13 principals and three deputy principals as coordinators of this function at their schools. The interviews were purposively and conveniently selected to gather data regarding school facilities maintenance and gain insight into the challenges this function presents to schools and their governing bodies. Findings indicate that schools generally do not have organisational structures for planned facilities maintenance, nor do they have policies on facilities maintenance. Evidence of facilities maintenance at schools mainly relates to concerns with facilities repairs, (mostly ‘as the need arises’) and general campus cleanliness; mostly with emergency and corrective forms of maintenance as opposed to crucial preventive maintenance.

In these research studies of the relationship between building condition and student achievement, two sets of data need to be counted. First, the researchers use an assessment survey of the conditions of the school building. School facilities exist to serve an educational function. The common intervening consideration in the evaluation of the educational facilities is how effectively they meet the needs of the students they serve (Hill, 1984).

Secondly, the researchers have relied heavily upon standardised tests of basic skills in order to measure student achievement. They gathered the standardised tests scores of students who occupy the targeted school. In most of these kinds of research studies, the socioeconomic backgrounds of students were statically controlled. Coleman (as cited in Al-Enezi, 2002) stated that

schools do not make a difference in student achievement. In their report, they indicated that the differences in student achievement are caused by the differences in student economic and social backgrounds (Lezotte & Passalacqua, as cited Al-Enezi, 2002). This finding indicates the importance of the quality of the conditions of school buildings on student achievement. Good school conditions appear to be an important precondition for student achievement, providing that other conditions are present that support a strong academic program in the school.

From these studies (Cash, 1993; Earthman, Cash, & Van Berkum, 1996; Hines, 1996), it can be seen that it is difficult to determine profound and specific school facilities maintenance and relate them to student achievement. Some of these research findings are various, complicated, and inconclusive.

Conceptual Framework

This section introduces the proposed conceptual framework for the study. Maintenance of school facilities includes activities which are needed to allow for repair, servicing and replacement procedures. Ray (2001) also stressed that maintenance enables the provision of services without go-slow. Hence, the function of the school system associated with upkeep, repair and replacement that ensure continuous usability of service facilities. The conceptual framework (Figure 1) proposes that school facilities need maintenance plan (emergency, predictive, routine and preventive approach) to identify factors which inhibit maintenance activities, sources of generating funds, implementation of the maintenance plan and how it promotes students' learning achievement.

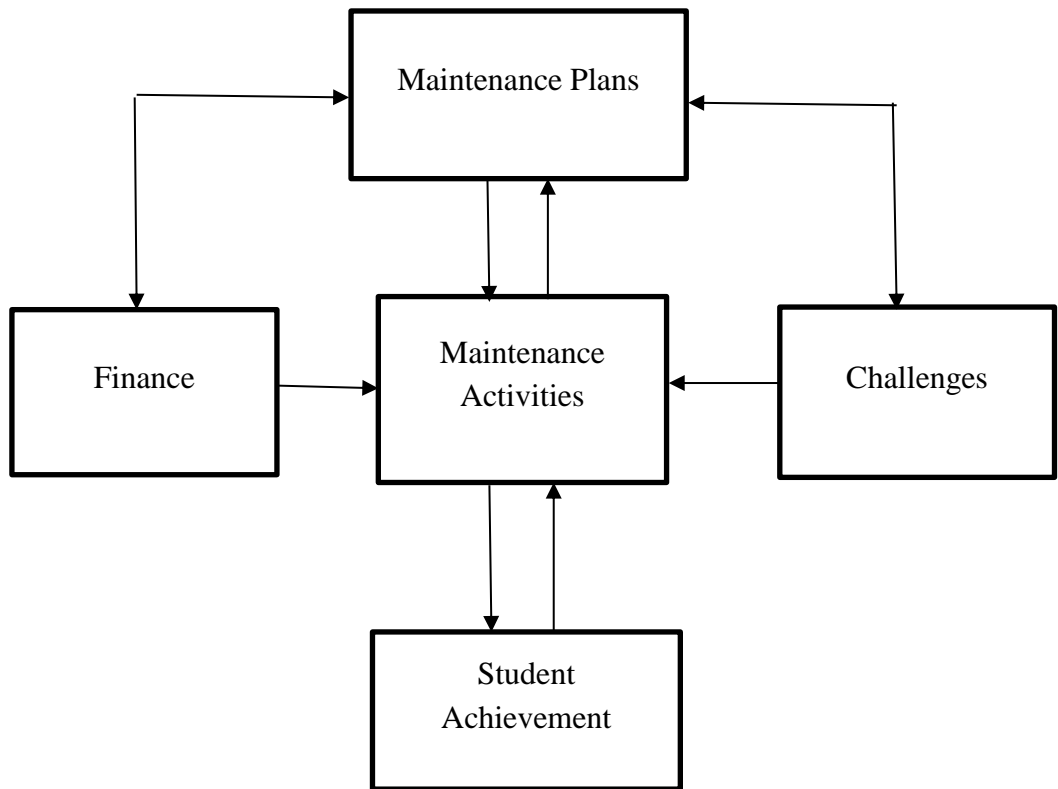


Figure 1: *School Facilities Maintenance Interaction*

In this conceptualisation, the centrality of facilities maintenance activities is important as it interacts with various variables to influence students' learning achievement. This interaction begins with developing facilities maintenance plans and guidelines to identify activities and how it should be done. The development of a facilities maintenance plan will influence facilities maintenance activities, thereby taking into consideration available funds and their challenges.

Planning of school facilities maintenance is based on need identification of the required school facilities and budget allocated for the purpose. According to Dobler (1971), the budget for educational materials can be prepared once the requirements are worked out. Thus, one can see that the purchase budget takes into account the inventory on one hand and orders on the other hand. Besides,

the budget itself may be formulated to attain certain targeted facility needs. The framework suggests that basic schools rely heavily on capitation grant and internally generated funds (IGF) for maintenance activities which not enough are leading to backlog facilities maintenance activities. However, they barely receive funds from NGOs and philanthropists.

The interaction of these variables has a long effect on teaching and learning. This can be seen from teachers and students being able to use school facilities at the optimal level to improve learning achievements. There are serious negative consequences for students' learning achievement when school facilities are not properly maintained. First in the ranking is poor academic performance. There is a nexus between learning and facilities, as availability and good condition will exude academic excellence. Also, if facilities are poorly maintained, this could lead to health and sanitary condition problems.

Summary of Literature Reviewed

From the review, a lot of work has been done in the field of school facilities maintenance research. The poor condition of school facilities in Ghana can no longer be ignored. In the field of facilities maintenance research, the concept of school facilities maintenance effectiveness requires knowledge, skill and expertise in handling different facets of the school system (Uko, 2001). Generally, facilities maintenance involved four (4) major sectors namely premises – includes 1) real estate, plant and machinery maintenance, space planning etc.; 2) support service; 3) information technology while the subsidiary sectors include infrastructural management and energy management and 4) health and safety environmental issues (Familoni, as cited in Achoru, 2015).

Again, it was evident that a lot of studies have been conducted on school facilities and school facilities maintenance. These studies have included investigations of school facilities and students learning achievements, school building conditions and students learning achievement, (Earthman, 2002; Xaba, 2012; Uko, 2001, 2015). Despite the availability of numerous studies on school facilities maintenance, this study was conducted in Cape Coast Metropolis, Ghana since the already existing ones were conducted in culturally different settings. The inclusiveness of studies which have investigated the relationship between school facilities maintenance and students learning may be an indication that all is not known about these two variables.

CHAPTER THREE

RESEARCH METHODS

The purpose of this study is to investigate how basic school facilities are maintained within the Cape Coast Metropolis. This chapter presents an overview of the method and procedures used for the study. The following are discussed: research design, population, sample and sampling techniques, instruments used in the data collection, administration of instruments and the procedure for data analysis.

Research Design

The study adopted the mixed method approach and used both qualitative and quantitative approaches to data collection and analysis to seek out and describe the head teachers and teachers' views regarding facilities maintenance because it is difficult to fully explore the concept of facilities maintenance solely through one research method (Gay, Mills & Airasian, 2009). In general, mixed methods research represents research that involves collecting, analysing, and interpreting quantitative and qualitative data in a single study or in a series of studies that investigate the same underlying phenomenon (Leech & Onwuegbuzie, 2008). Mixed methods research is a research design with philosophical assumptions as well as methods of inquiry (Creswell & Plano 2007). According to Creswell and Plano, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination

provides a better understanding of research problems than either of approaches alone.

The use of the qualitative approach enabled the researcher to develop an understanding of individuals and events in their natural settings, taking into account the relevant context. This study aimed at establishing head teachers' lived experiences towards facilities maintenance in the basic schools in Cape Coast Metropolis. Therefore, the respondents were asked to describe their everyday experiences relating to facilities maintenance (Gay, Mills & Airasian, 2009; Creswell, 2008; Creswell & Plano, 2011). Quantitative designs, on the other hand, are well suited for identifying general trends in populations (Gall, Gall & Borg, 2007). This study used both qualitative and quantitative methods to get some reviews on teachers' perspective on the current practices of school facilities maintenance at their schools and finally to draw a valid conclusion. This allowed the researcher to collect data through different instruments since it is a common characteristic of educational research (Best & Khan, 2001).

The study used a sequential explanatory method of mixed method research design. The collection and analysis of quantitative data followed by the collection and analysis of qualitative data (Creswell, 2003; Creswell & Plano, 2011). The primary focus was to explain quantitative results by using qualitative data to explore certain results in more detail and help explain unexpected results (e.g., using follow-up interviews to better understand the results of a quantitative study on the school facilities maintenance).

The purpose of sequential explanatory design is that qualitative data was used to enrich, explain, or elaborate upon, results gained from quantitative approaches (Creswell, 2003). This method has two phases: phase one involved

the collection and analysis of quantitative data. The second phase employs qualitative methods to elaborate on the results from the quantitative phase. One data resource may not be enough; initial results need to be further explained and the second method was used to enhance the primary method (Creswell & Plano, 2011).

This design involved the collection and analysis of quantitative data followed by the collection and analysis of qualitative data. Priority was given to the quantitative data, and the findings were integrated during the interpretation phase of the study. Interviews of head teachers were used to explore how teachers described school facilities are maintained. The more we use different designs and instruments the more our data will be vast, deep, reliable and valid (Gall, Borg, & Gall, 2003). If you generated a finding by a qualitative method, perhaps you can check it by using a quantitative data collection method.

Mixed method research uses instruments like questionnaires and interviews to gather information from groups of respondents (Ary, Jacobs, Razavieh, & Sorensen, 2006). In a descriptive study, researchers ask questions about people's beliefs, opinions, characteristics, and behaviour (Creswell, 2003). There are different types of survey designs like longitudinal and cross-sectional, in this study however the use of cross-sectional survey design was employed. The design was considered appropriate for this study since it involved collecting data at one point in time regarding people opinions and beliefs (Babbie, 2005; Creswell, 2003). It also enabled the researcher to obtain current information about the problems encountered in the schools and the actual practices they perform and their commitment regarding efficient utilisation of school facilities and their maintenance.

I examined the convergence of evidence from different methods that study of the same phenomenon to corroborate findings from one method by examining the findings using a different method. The value of triangulation is that it allows the researcher the opportunity to examine whether findings converge, are inconsistent or contradict (Ary, Jacobs, Razavieh, & Sorensen, 2006). According to Ary, Jacobs, Razavieh, and Sorensen, the purpose of triangulation is to collect, analyse, and merge results to better understand a research problem. Triangulation allows researchers to collect separate forms of data at separate times or simultaneously.

However, there are also a number of weaknesses. It is difficult for a single researcher to carry out both quantitative and qualitative research (Creswell & Plan Clark, 2011). It is difficult to have equal skill sets in both methods, and especially if data are collected simultaneously, there is a great time commitment (Greene, 2007). The researcher must be able to understand the complexities of both approaches so as to make wise decisions about how they can appropriately be mixed. Conducting a mixed methods study is likely to be more expensive than using a single approach. Quantitizing and qualitzing data can have its own problems (Ary, Jacobs, Razavieh, & Sorensen, 2006). Also, interpreting conflicting results may be difficult.

Study Area

This study was based on how school facilities are maintained in basic schools within the Cape Coast Metropolis. Cape Coast is one of 20 administrative districts of Central Region of south Ghana. The district is bordered to the North by the Twifo Heman-Lower Denkyira District, to the East

by Abura-Asebu-Kwamankese District, to the South by the Gulf of Guinea and to the West by the Komenda-Edina-Eguafo-Abirem Municipal District.

Cape Coast Metropolis was selected to be an area of study for this study as a result of review literature on how basic schools maintain their facilities in the Metropolis that revealed that there was no study done on how basic schools maintain their facilities. Also, the Metropolis has a shared characteristic in the provision of basic education as provided by other districts in the country. The district had a diversity of schools where there are a public and privately owned schools where the researcher accessed comprehensive amount of information.

Furthermore, Cape Coast Metropolis was selected because it is believed to be the hub of education in Ghana and has schools taught by teachers from different parts of the country. The schools are heterogeneous with varied characteristics with respect to teachers' age, geographical locations, school type, gender and programmes offered which may influence facilities use and maintenance.

Population

Population in research refers to the aggregate or totality of objects or individuals regarding which inferences are to be made in a sampling study (Seidu, 2007). Population, as used in this study, refers to the people with common characteristics that the researcher decided to involve in the study. The target population of this study were all head teachers and teachers in the 78 basic schools, in the Cape Coast Metropolitan area during the 2017/2018 academic year.

Sampling Procedure

According to Kumekpor (2002), sampling is the use of the definite procedure in the selection of a part for the express purpose of obtaining from its description or estimates certain properties and characteristics of the whole. Sampling is the process of selecting a representative unit from a population. Sample, as used in this work, is a small proportion of the population selected for the study. It is the selected subject of the whole which is being used to represent the population (Seidu, 2007). A multi-stage random sampling technique was used to select the sample for the study.

Multistage sampling refers to sampling plans where the sampling is carried out in stages using smaller and smaller sampling units at each stage (Dudovskiy, 2017). Multistage sampling divides large populations into stages to make the sampling process more practical. It addresses certain disadvantages associated with true random sampling such as being overly expensive and time-consuming. In this study, stratified, simple random and purposive sampling techniques were used.

Stratified sampling technique was used in the first stage to group the population into groups. The groups were based on the number of circuits within the Metropolis. There were six circuits within Cape Coast Metropolis and the number of schools within each circuit are below.

Table 1: Distribution of Circuits in Cape Coast Metropolis

No.	Circuit	Number of schools
1	Aboom	15
2	Bakaano	14
3	Cape Coast	12
4	Efutu	13
5	OLA	11
6	Pedu	13
Total		78

Source: Cape Coast Metropolitan Directorate of Education (2017)

To provide high representation from the target population, 50 schools were selected from the 78 schools. A disproportional number was used to select a total number of schools from each stratum. 8 schools were selected from circuits with a total number of schools less 14 and 9 schools were selected from circuits with schools 14 or more. Circuits with schools $\leq 13=4$, i.e. $8 \times 4= 32$; circuits with school $\geq 14=2$ i.e. $9 \times 2=18$. The study used a list of headteachers and teachers of basic schools in the Cape Coast Metropolis.

The second stage used a simple random sampling technique where all possible respondents that were likely to be selected. The names of teachers were written on slips of paper and put in a container. The papers were mixed well, one slip of paper at a time was drawn from the container without replacement and looking into it. A slip was selected; it was recorded and the process continued until the required number of respondents were recorded. Six teachers were selected from each school whereby $(6 \times 32) + (6 \times 18) = 192 + 108 = 300$ teachers. Six teachers were selected as a result of the inequality of the number of classes

in the basic schools. Some of the basic schools offer primary education (from early childhood to class 6) while others have classes up to junior high school.

Purposive sampling technique was used to select 6 head teachers from the target population; 1 head teacher from each stratum. The researcher purposely chose the respondents who in my opinion are thought to be knowledgeable and relevant to the research topic. The total sample size used was 306 respondents comprising 6 head teachers and 300 teachers from the selected basic schools in Cape Coast Metropolis.

Data Collection Instruments

The study used a questionnaire and an interview guide to collect data. The questionnaires were used to elicit information from teachers. The reason for using the questionnaire is that it is a quick way of collecting data. It is also known to be quite valid and reliable if well-constructed. It is also economical in terms of money and time. The research literature (Robson, 2002; Ary, Jacobs & Razavieh, 1985) indicates that the use of the questionnaire has the advantage of helping the researcher to within the shortest possible time reach out to many respondents especially where the geographical area is wide. The researcher used closed-ended questions to elicit the information needed.

The questionnaire was divided into two parts. The first part elicited background information from respondents and had 3 items. The second part was divided into five sections with 21 items, Section (A) contained 5 items and covered data on facilities maintenance practices in basic schools, Section (B) contained 4 items; it elicited information from respondents on plans which direct the activities facilities maintenance. Section (C) contained 4 items and covered information on how basic schools get resources to maintain facilities,

Section (D) contained 4 items and elicited information from respondents on factors which inhibit facilities maintenance activities and Section (E) contained 4 items and elicited information from respondents on the relationship between school facilities maintenance and students' learning.

The interview guide was used to collect data from Headteachers on how basic schools maintain their facilities in Cape Coast Metropolis. An interview is a form of questioning characterised by the fact that it employs verbal questioning as for its principal technique of data collection. It involves posing questions to respondents for answers in a face-to-face situation. According to Aiken and Groth-Marnat (2006), an interview is more effective than others in establishing rapport and getting interviewees to open up. It also represents a direct attempt by the researcher to obtain reliable and valid measures of characteristics, behaviours, attitudes, etc. in the form of verbal responses from one or more respondents (Creswell, 2007).

The interview guide consisted of seven items. Items one, two and three elicited information on facilities maintenance practices in basic schools, item four elicited information on plans which direct the activities facilities maintenance, item five collected data on the factors which inhibit school facilities maintenance item six elicited information on how basic schools get resources to maintain their facilities, and item seven gathered data on the relationship between school facilities maintenance and students' learning achievement.

Pilot testing

The two instruments were pilot-tested in two schools in the Komenda-Edina-Eguafo-Abrim (KEEA) municipality in the Central Region of Ghana

with similar characteristics as those that were used for the actual study in the Cape Coast Metropolitan area such as their usage and maintenance of school facilities. The pilot testing was conducted by using twenty-two respondents comprising twenty teachers and two head teachers. The research questionnaires were pilot tested on the 20 teachers while the interview guide on two head teachers.

The two instruments were retrieved from the respondents immediately after completion and the data obtained analysed by computing their reliabilities and inter-item correlations. The main purpose of the pilot test was to check the reliability of the items, the time is given, the consistency and content of the items. It also helps in assessing whether the sampling frame and technique are effective. Accordingly, the format and order of the question were improved. Based on the inter-item correlation, some of the items were modified.

Validity and reliability

The two instruments were given to my two supervisors to determine the face validity of the instruments since they have conducted similar research involving school facilities. Again, two colleagues who have taught at the Basic School level before were also given the instruments to assess the items. Furthermore, a field test was conducted to test the interview instrument to establish trustworthiness and credibility. Through this process, the appropriateness of the language used was checked in order that the respondents understand the items on it. Again, certain wordings which were perceived to be ambiguous were also modified as well as checking the various items to ensure that the items really measure what they are intended to measure.

The reliability of the instrument (questionnaire) was estimated using the Cronbach's Alpha to determine whether each item under the various subscales was related to each other after the pilot- testing exercise and again after the actual data collection for the studies. During pilot- testing exercise, the reliability estimates obtained using the Cronbach's Alpha was 0.88.

Data Collection Procedures

The researcher collected an introductory letter from the Director, Institute of Educational Planning and Administration, University of Cape Coast, soliciting for the assistance of the head teachers and circuit supervisors for the effectiveness of the study. The researcher visited the selected schools to seek permission and then arrange for convenient days and time for the administration of the questionnaire. During the administration, teachers were briefed on the objectives of the study and the need to respond frankly to the items. The items were distributed to them. Teachers' concerns were addressed after which they were given time to respond to the items. The completed questionnaires were retrieved the same day with the assistance of the head teachers of the respective schools.

An appointment was made with respondents for the interview to be conducted as a means of capturing respondents' perspectives on the issues raised in the study. The interview schedule was used to elicit information from the head teachers on facilities maintenance. During the interview, I briefed the respondents on the topic to arouse their interest.

Data Processing and Analysis

The Research Question One sought to determine how basic schools maintain their facilities in the Cape Coast Metropolis, the data obtained from the teachers on the questionnaire were scored for individual teachers after which individual item means and overall means were calculated for. The responses were coded to determine the direction of teacher's responses that is, whether they have a positive or negative view of facilities maintenance. In order to do this, the responses that were obtained from the data collection process were coded from 1-4 for positively worded items from "No Maintenance" to "Well Maintain" in that continuum. This indicated the relative standing of the individuals on the dimensions of their view on the instrument. The researcher used a decision rule to determine the level of maintenance; mean scores above 3.5=Well Maintain, mean scores from 3.0 to 3.49=Fairly Maintain, mean scores from 2.5 to 2.99=Barely Maintain and mean scores below 2.5 indicates No Maintenance. A higher mean above 2.99 shows that majority of the respondents indicated that their schools carried out maintenance activities most of the time.

The research question two sought to identify the plans of schools which direct the maintenance of their facilities. The data from the respondents were analysed using means, standard deviations and frequency distribution; data obtained from the teachers on the questionnaire were coded from 1-4 for positively worded items from "Strongly Disagree" to "Strongly Agree" in that continuum. The researcher used a decision rule of 2.5 to determine which items need to be commented on. A higher mean above the decision rule implies that most of the respondents agreed to the statement and vice versa.

To answer research question three, four and five, the data obtained from the teachers on the questionnaire were coded from 1-4 for positively worded items from “Strongly Disagree” to “Strongly Agree” in that continuum. The data from the respondents were analysed using frequency distribution, means and standard deviations. Adopting the descriptive statistic tool (mean), the scoring keys (eg. Strongly Disagree = 1, Disagree = 2, Agree = 3 and Strongly Agree = 4) were computed to establish decision rule for ranking the means of the items. The researcher obtained a decision rule of 2.5. The researcher used a decision rule of 2.5 to determine which items need to be commented on. A higher mean above the decision rule implies that most of the respondents agreed to the statement and vice versa.

The research hypothesis was used to determine any possible difference in facilities maintenance activities based on circuits. To test this research hypothesis, Chi-square (X^2) test was conducted.

An analysis is about making sense of the data gathered during the research process, in this case, the text from the interview transcripts. The primary goal within the data analysis in this research created substantive categories that emerged in the head teachers’ responses in focal areas. Themes were identified in the data for focal areas of the analysis. Essentially, these focal areas stemmed from the questions used in the interviews. The researcher gathered a text database, the data analysis of texts were divided into groups of sentences, called text segments and to determine the meaning of each group of sentences by using Nvivo 8.0 software.

All interviews were recorded digitally. Responses were transcribed (using selective protocol) into Microsoft Office for word. The word version

was then converted into rich text format and imported into Nvivo 8 (Qualitative data analysis software), specifically to ‘internals’. Nodes (themes) were created based on literature (empirical review) on the work. “Bottom-up” approach of coding was also carried within Nvivo. The coding of the text into substantive categories was about the grouping of ideas into thematic units (Creswell & Plano, 2011). This was completed with an agenda of not generating unmanageable numbers of categories. A process of reiteration was used.

The transcripts were read as a whole and then reread a number of times to seek to identify categories in the data and draw out the evidence to substantiate these categories. The sequential processes in the data analysis were encompassed familiarisation with the text of each interview, identifying categories of description, comparison of categories across interviews, and the identification of exceptions when the common categories did not appear to fit the general case (Creswell, 2008). The researcher analysed the words to describe the central phenomenon under study.

Chapter Summary

In this chapter, the methodology and the design of the study were outlined and situated within mixed methods of research. It detailed the mixed method design in the study, population and study area. Building on the research design, this chapter further discussed the sampling procedure, data collection instruments, data collection procedures and data analysis and processing.

CHAPTER FOUR

RESULTS AND DISCUSSION

The purpose of this study was to investigate how schools facilities are maintained in the basic schools within Cape Coast Metropolis. This chapter presents the results and discussion of the study. The research questions were analysed using quantitative (means, standard deviation and frequency distribution) and qualitative (NVIVO) tools. The facilities maintenance question was analysed using descriptive statistics. The Chi-square (X^2) test was used to test the hypothesis on whether there is no significantly different in facilities maintenance activities of basic schools based upon circuits. The results of the study are presented under the following headings:

1. Demographic Characteristics of Respondents.
2. Research Question One: What activities do headteachers and teachers in basic schools do to maintain their facilities in the Cape Coast Metropolis?
3. Research Question Two: What plans direct headteachers and teachers' activities of facilities maintenance of basic schools in Cape Coast Metropolis?
4. Research Question Three: How do basic schools generate resources to maintain their facilities in Cape Coast Metropolis?
5. Research Question Four: What factors inhibit school facilities maintenance of basic schools in Cape Coast Metropolis?

6. Research Question Five: How do school facilities maintenance activities promote students' learning achievements of basic schools in Cape Coast Metropolis?
7. Hypothesis: Views of male teachers on school facilities maintenance activities are not significantly different from that of female teachers in Cape Coast Metropolis.

Demographic Characteristics of Respondents

In all 300 teachers and six head teachers from the six circuits in the Metropolis were involved in the study. The demographic characteristics of the respondents include their gender, level of education, years of service and circuit. The demographic data were analysed using frequencies and percentages. The results are presented in Tables 2, 3 and 4.

Table 2: Gender of Teachers

Characteristic	Frequency (f)	Percentage (%)
Gender		
Male	95	31.7
Female	205	68.3
Total	300	100

Source: Field Survey (2018)

Table 2 shows that majority of the respondents (68%) are females while about 32% are males. Given the uneven gender distribution, the study inferred that the aggregated responses about how teachers maintain their school facilities were more representative of male perspectives.

Table 3: Educational Qualification of Teachers

Characteristic	Frequency (f)	Percentage (%)
Masters	56	18.7
Bachelor	161	53.7
HND	5	1.7
Diploma	67	22.3
Certificate	11	3.6
Total	300	100

Source: Field Data (2018)

It is shown in Table 3 that more than half of the respondents (161, 53.7%) had a bachelor's degree while only 5(1.7%) of the respondents had HND. The rest of the respondents had diploma level education (22.3%), master level education (18.7%) and certificate level education (3.6%). The results in Table 2 imply that more females were involved in the study than males. Again, most of the teachers had a bachelor level of education.

Table 4: Years of Service of Teachers and Headteachers

Years of Service	Frequency (f)	Percentage (%)
Less than 6 years	75	24.5
7-12 years	109	35.6
13-18 years	51	16.7
19 years and above	71	23.2
Total	306	100.0

Source: Field Survey (2018)

Table 4 shows the years of service of the respondents. It is shown that 109(35.6%) of the respondents had served between 7 to 12 years. The rest of the respondents had served for less than 6 years 75(24.5%), 19 years and above 71(23.2%) and 13 to 18 years 51(16.7%). The implication of these findings is that most of the respondents had served for more years and therefore it can be inferred that they had acquired relevant experience. Thus, the respondents were in a good position to provide the data required of them in the study. Five school heads were also interviewed as part of the study.

Results

Research Question 1: What activities do headteachers and teachers in basic schools do to maintain their facilities in the Cape Coast Metropolis?

This research question sought to identify activities basic schools carry out to maintain their facilities. The data obtained from the respondents were analysed using frequency distribution, means and standard deviations. The researcher used a standard benchmark to determine the level of maintenance; mean scores above 3.5=Well Maintain, mean scores from 3.0 to 3.49=Fairly Maintain, mean scores from 2.5 to 2.99=Barely Maintain and mean scores below 2.5 indicates No Maintenance. A higher mean above 2.99 shows that majority of the respondents indicated that their schools carried out maintenance activities most of the time. The results are presented in Table 5.

Table 5: School Facilities Maintenance Activities

Statement	N		R		S		A		M	SD
	F	%	F	%	F	%	F	%		
The school ensures that:										
Worn out wires, light bulbs and switches are replaced	19	6.3	48	16.0	120	40.0	113	37.7	3.09	0.89
Windows, doors, floors and dustbins are cleaned	2	0.7	38	12.7	106	35.3	154	51.3	3.36	0.73
Broken school walls, windows and doors are repaired	3	1.0	38	12.7	104	34.7	155	51.6	3.36	0.74
Marks and spots are cleaned, removed or painted	26	8.7	73	24.3	144	48.0	57	19.0	2.77	0.86
School compound is swept and weeded	3	1.0	4	1.3	29	9.7	264	88.0	3.85	0.47

Source: Field Survey (2018)

Table 5 shows the school facilities maintenance activities as indicated by the respondents. It can be seen that the statement ‘the school ensures that the school compound is swept and weeded’ recorded the highest mean of 3.85 and a standard deviation of 0.47. It is revealed that majority of the respondents (40% and 37.7%, as shown in Table 5) agreed and strongly agreed respectively with the statement that their schools ensured replacing worn out wires, light bulbs and switches were done sometimes. This implies that most of the schools ensured that their school compound was swept and weeded always. Next to this, ensuring that broken school walls, windows, doors and roofing sheets are repaired ($M=3.36$, $SD=0.74$). It is shown in Table 5 that the majority of the respondents (51.6%) strongly agreed that their schools always ensured that windows, doors, floors and dustbins are cleaned. Furthermore, ensuring that windows, doors, floors, and dustbins are cleaned and washed obtained $M=3.36$ and $SD=0.73$ which were significant facilities maintenance activities. The pattern of the responses indicated that 51.3% of the respondents strongly agreed that their schools ensured that broken school walls, windows and doors were repaired always. Therefore, most of the schools engaged in repairs and cleaning of walls, windows, doors, roofing sheet and dustbins most of the time.

Furthermore, the majority of the respondents, 48% and 19% (as shown in Table 5) selected agreed and strongly agreed with cleaning, removal and painting of marks and spots. This maintenance activity is rarely engaged obtained a mean score of 2.77. Furthermore, in terms of cleaning, removal and painting of marks and spots, the majority of the respondents (48%) indicated that this activity was carried out sometimes. Overall, it can be realised that the schools sampled always engaged in sweeping and weeding of school compound, repairs

and cleaning of walls, windows, doors, roofing sheet and dustbins. It can be observed that 88% of teachers selected strongly agree.

The school heads interviewed also indicated that they carried out maintenance activities on windows, doors and other facilities when they break down. They also engaged in the scrubbing of floors, fixing cracked walls and painting. Specifically, some of the comments are:

We do some maintenance when the windows, doors and other facilities break down, we maintain them. Once a while we do some painting of walls and scrubbing of floors. (School Head, Pedu-Abura Circuit)

We repair broken doors, windows and furniture. We also fix cracked walls and plaster floors when need be. (School Head, Bakaano Circuit)

We only maintain the roofing the windows and doors, and cupboards. (School Head, OLA Circuit)

Research Question 2: What plans direct headteachers and teachers' activities of facilities maintenance of basic schools in Cape Coast Metropolis?

This research question sought to identify the plans of schools which direct the maintenance of their facilities. The data from the respondents were analysed using means, standard deviations and frequency distribution. The researcher used a decision rule of 2.5 to determine which items need to be commented on. A higher mean above the decision rule implies that most of the respondents agreed to the statement and vice versa. The results are presented in Table 6.

Table 6: Plans Directing Facilities Maintenance Activities

Statement	SD		D		A		SA		M	SD
	F	%	F	%	F	%	F	%		
The school has...										
a plan to maintain the facilities to avoid breakdown and ensure optimal performance of the facilities	8	2.7	57	19.0	156	52.0	79	28.3	3.02	0.75
a maintenance plan to carry out urgent corrective measures or steps to replace damaged school facilities	15	5.0	55	18.3	166	55.3	64	21.3	2.93	0.77
a maintenance plan to repair broken-down school facilities	10	3.3	58	19.3	162	54.0	70	23.3	2.97	0.75
a maintenance plan, which outlines the use of computer software to predict equipment failure based on age, user demand and performance measures.	91	30.3	84	28.0	88	29.3	37	12.3	2.24	1.02

Source: Field Survey (2018)

Table 6 shows the plans for basic schools for facilities maintenance. It can be seen from the table that the item ‘the school has a plan to maintain the facilities to avoid breakdown and ensure optimal performance of the facilities’ recorded the highest mean of 3.02 and standard deviation of 0.75. The frequency distribution pattern indicated 52% and 28.3% of teachers selected agree and strongly agree respectively. This implies that most of the respondents agreed that their schools had plans to maintain facilities to avoid breakdown to ensure optimal performance. On the other hand, the item ‘the school has a maintenance plan, which outlines the use of computer software to predict equipment failure based on age, user demand and performance measures’ recorded 30.3% for strongly disagree and 28.0% for disagreeing with the lowest mean of 2.24 and standard deviation of 1.02. This implies that a smaller proportion of the respondents agreed to this statement.

The other identified plans were to repair broken-down school facilities ($M=2.97$, $SD=0.75$) and plans to carry out urgent corrective measures or steps to replace damaged school facilities ($M=2.93$, $SD=0.77$). From the frequency distribution table (as shown in Table 6), 54.0% out of the 300 teachers indicated that they agree that ‘the school has a maintenance plan to repair broken-down school facilities. The distribution pattern of responses on the school has a maintenance plan to carry out urgent corrective measures or steps to replace damaged school facilities were as follows; ‘Strongly Agree=64 (21.3%), ‘Agree=166 (55.3%), ‘Disagree=55 (18.3%) and ‘Strongly Disagree’=15 (5.0%).

These findings imply that most of the schools sampled had maintenance plans mainly to avoid and repair the breakdown of facilities. This was similar

to the views of the school heads who were interviewed. Most of the school heads indicated that they only carried out maintenance as and when was required. Some of the school heads, however, indicated that they had the plan of carrying out maintenance every term. Some of the critical statements of the respondents are:

We carry out maintenance when the need arises. When some of the facilities break down we carry out maintenance on such facilities. For example, our old classroom block is under maintenance now with the help of our PTA. (School Head, Bakaano Circuit)

Anytime a problem arises, we carry out maintenance. We don't have a specific time for repairs. (School Head, Efutu Circuit)

Every academic year we put it in an action plan like every term we will do some maintenance so we have that plan there. (School Head, Cape Coast Circuit)

Research Question 3: How do basic schools generate resources to maintain their facilities in Cape Coast Metropolis?

This research question sought to find out how basic schools obtained resources to maintain their school facilities. The data from the respondents was analysed using means, standard deviations and frequency distribution. Adopting the descriptive statistic tool (mean), the scoring keys (eg. Strongly Disagree=1, Disagree=2, Agree=3 and Strongly Agree=4) on section C of the questionnaire were computed to establish decision rule for ranking the means of the items. The researcher obtained a decision rule of 2.5. The data were analysed using

means and standard deviations. The researcher used a decision rule of 2.5 to determine which items need to be commented on. A higher mean above the decision rule implies that most of the respondents agreed to the statement and vice versa. The results are presented in Table 7.

Table 7: Obtaining Resources for Facilities Maintenance

Statement	SD		D		A		SA		M	SD
	F	%	F	%	F	%	F	%		
The school receives funds from Capitation Grant for facilities maintenance	17	5.7	41	13.7	137	44.7	108	36.0	3.11	0.85
The school receives funds from NGOs to maintain the school facilities	163	54.3	79	26.3	37	12.3	21	7.0	1.72	0.93
The school uses its internally generated funds such as (P.T.A Levy) for school facilities maintenance	18	6.0	34	11.3	141	47.0	107	35.7	3.12	0.83
The school receives funds from philanthropists for school facilities maintenance	128	42.7	105	35.0	43	14.3	24	8.0	1.88	0.94

Source: Field Survey (2018)

Table 7 shows the means by which the schools sampled generate resources to maintain the facilities in their schools. The table shows that the statement ‘the school uses its internally generated funds such as (P.T.A Levy) for school facilities maintenance’ recorded the highest mean of 3.12 and a standard deviation of 0.83. Furthermore, the frequency distribution (as shown in Table 7) revealed that majority of the teachers (35.7% and 47%) from the selected schools strongly agree and agree that the schools use internally generated funds to maintenance facilities. This implies that most of the respondents agreed that their schools used internally generated funds such as P.T.A. Levy for maintaining their facilities.

It is shown also that the respondents agreed that the school receives funds from Capitation Grant for facilities maintenance ($M=3.11$, $SD=0.85$). The frequency distribution (as shown in Table 7) further highlights that 44.7% and 36.0% of the teachers agree and strongly agree with the statement that ‘the school receives funds from Capitation Grant for facilities maintenance respectively. However, it is shown that 54.3% and 26.3% selected strongly disagree and disagree respectively for the statement ‘the school receives funds from NGOs to maintain the school facilities’ with a mean score of 1.72 and standard deviation of 0.93. This means that most of the respondents did not agree with receiving funds from NGOs for the maintenance of facilities. In a similar vein, a significant portion of the respondent did not agree that their schools received funds from philanthropists for school facilities maintenance ($M=1.88$, $SD=0.94$). The frequency distribution table indicates that 42.7% strongly disagree and 35.0% disagree that schools receive funds from philanthropist for facilities maintenance.

The findings show that the main sources of resources for facilities maintenance for the basic schools in the Cape Coast Metropolis were internally generated funds like PTA Levy and Capitation Grant. In like manner, all the school heads interviewed indicated that the main sources of funds for facilities maintenance was through internally generated funds such as from the PTA as well as through the capitation grant. Some of the direct statements of the respondents are:

We get funds through the internally generated funds and also a portion of the capitation grant, even though that is not enough. The PTA also supports at times. (School Head, Cape Coast Circuit)

We use some funds from the capitation grant. Sometimes we get support from internally generated funds too. (School Head, Bakaano Circuit)

We use the internally generated funds, sometimes too the Parent Teacher Association dues and then the capitation grant to we have some part which is meant for maintenance. (School Head, Abura Circuit)

Research Question 4: What factors inhibit school facilities maintenance of basic schools in Cape Coast Metropolis?

This research question sought to identify the factors that inhibit the maintenance of facilities as reported by the respondents. The data was analysed using frequency distribution, means and standard deviations. Adopting the descriptive statistic tool (mean), the scoring keys (eg. Strongly Disagree=1, Disagree=2, Agree=3 and Strongly Agree=4) on section C of the questionnaire

were computed to establish decision rule for ranking the means of the items. The researcher obtained a decision rule of 2.5. The data were analysed using means and standard deviations. The researcher used a decision rule of 2.5 to determine which items need to be commented on. A higher mean above the decision rule implies that most of the respondents agreed to the statement and vice versa. The results are presented in Table 8.

Table 8: Factors Inhibiting School Facility Maintenance

Statement	SD		D		A		SA		M	SD
	F	%	F	%	F	%	F	%		
There are adequate insightful programmes to educate staff members and pupils on the need to embrace maintenance culture.	55	18.3	73	24.3	132	44.0	40	13.3	2.52	0.94
There is adequate and regular inspection to detect cracked walls, damaged furniture and other infrastructure (play grounds, canteen etc.) for prompt repairs	42	20.7	68	22.7	134	44.7	36	12.0	2.48	0.95
There are adequate funds to purchase maintenance materials and pay for the labour cost	81	27.0	112	37.3	68	22.7	39	13.0	2.22	0.99
There are clear procedures to guide the school facility maintenance staff	43	14.3	102	34.0	117	39.0	38	12.7	2.50	0.89

Source: Field Survey (2018)

Table 8 shows the views of the respondents concerning the factors that inhibit schools' facility maintenance. From the table, it can be seen that the major factor that inhibits school facility maintenance was the adequacy of funds which recorded the lowest mean of 2.22. This is further shown as 27.0% and 37.3% of the teachers selected strongly disagree and disagree respectively. This means that most of the respondents did not agree that there was an adequate fund for facilities maintenance. Thus, funds for maintenance were inadequate. Aside from this, the rate of inspection to detect damages was also a major issue. It recorded 20.7 % of strongly disagree and 22.7% disagree with a mean score of 2.48 and a standard deviation of 0.95.

The other factors identified were clear procedures to guide facility maintenance staff (M=2.50, SD=0.89) and adequate insightful programmes to educate staff and pupils on embracing maintenance culture (M=2.52, SD=0.94). From Table 8, 39% and 44% indicated that they agree there are adequate insightful programmes and clear procedures to the school facilities maintenance staff respectively. The implication of the findings is that the adequacy of funds is a major issue in the maintenance of school facilities.

These findings were similar to the views expressed by the school heads. The major issue indicated by the school heads was the inadequacy of funds. They expressed worry at not getting the required funds for maintenance activities as and when they are needed. Some of the critical statements are:

The major challenge has to do with monetary matters because at times we need to buy certain things to help in maintaining those facilities but what we have is inadequate.

(School Head, Efutu Circuit)

Maintenance is all about funds, if you have funds there is nothing that prevents you from doing it. But for us, the funds are not adequate for all the maintenance activities required.

(School Head, Ola Circuit)

Sometimes it is difficult to get experts like carpenters, and masons to come and do the work for us. They simply don't want to make time for us any time we need them. The funds required are also inadequate. (School Head, Aboom Circuit)

Research Question 5: How do school facilities maintenance activities promote students' learning achievements of basic schools in Cape Coast Metropolis?

This research question sought to identify how school facilities affect learning achievements. The data from the respondents were analysed using frequency distribution, means and standard deviations. Adopting the descriptive statistic tool (mean), the scoring keys (eg. Strongly Disagree = 1, Disagree = 2, Agree = 3 and Strongly Agree = 4) on section E of the questionnaire were computed to establish decision rule for ranking the means of the items. The researcher obtained a decision rule of 2.5. The data was analysed using means and standard deviations. The researcher used a decision rule of 2.5 to determine which items need to be commented on. A higher mean above the decision rule implies that most of the respondents agreed to the statement and vice versa. The results are shown in Table 9.

Table 9: School Facilities Maintenance and Learning Achievement

Statement	SD		D		A		SA		M	SD
	F	%	F	%	F	%	F	%		
The school has inadequate facilities for teaching-learning activities to helps improve learning achievement	41	13.7	87	29.0	125	41.7	47	15.7	2.59	0.91
Most students would not learn more and achieve at higher levels if the facilities are in good condition	12	4.0	28	9.3	91	30.3	169	56.3	3.39	0.82
The school's facilities are not in good conditions which enable pupils to learn effectively in friendly environment	24	8.0	69	23.0	148	49.3	59	19.7	2.81	0.84
The school's facilities are not neat and in good condition impact positive teaching and learning.	32	10.7	64	21.3	131	43.7	73	24.3	2.82	0.92

Source: Field Survey (2018)

Table 9 shows how school facilities affect students' achievement. It is shown that the statement 'Most students would learn more and achieve at higher levels if the facilities are in good condition' recorded the highest mean of 3.39 and a standard deviation of 0.82. The response pattern of this statement indicated that 56.3% and 30.3% of the teachers strongly agree and agree respectively.

Forty-one per cent and 15.7% of the teachers agreed and strongly agreed respectively that the school has adequate facilities for teaching and learning activities to help improve learning achievement ($M=2.82$, $SD=0.92$). on the issue of enabling pupils to learn effectively in a friendly environment ($M=2.81$, $SD=0.84$), 49.3% and 19.7% of the teachers agreed and strongly agreed respectively. The implication of these findings is that factors inhibiting school facilities maintenance activities have the potency of affecting students' academic performance positively and make students learn in a friendly environment.

The school heads interviewed also revealed that school facilities had a relationship with the academic achievement of students. They viewed students' academic performance as depending on the nature of comfort in the school environment as well as the facilities available for facilitating teaching and learning. Some of their direct statements are:

There is a relationship between school facilities and academic achievement, for instance, when students don't have a place to sit comfortably and learn it affects learning. In our school, for example, we have no lights now and so the classrooms become dark when it's about to rain. This affects

the academic work of students. (School Head, Aboom Circuit)

I think there is a relationship between student achievement and facility maintenance. For instance, I have observed that, when the desks are in good state, teaching and learning is effective. But when they are in a bad state, pupils do not pay attention in class. They may be cautious not to get injured and thus do not focus on academic work. This eventually affects students' achievement. (School Head, Bakaano Circuit)

Yes, there is a relationship between student achievement and school facilities because if someone comes to school and the environment is not safe and conducive for learning it means that person cannot stay in school to learn. So if you maintain facilities properly then it means students will feel comfortable and then stay in school to study which will, in turn, improve their academic performance. (School Head, Efutu Circuit)

Hypothesis

Null Hypothesis

H₀: Views of male teachers on school facilities maintenance activities are not significantly different from that of female teachers in Cape Coast Metropolis.

Alternative Hypothesis

H₁: Views of male teachers on school facilities maintenance activities are significantly different from that of female teachers in Cape Coast Metropolis.

This hypothesis sought to identify the difference in facilities maintenance activities of the various circuits. The data were analysed using Chi-square test. A Chi-square test of independence was computed. This test was used because there were two categorical variables (Gender & Ratings) each with different levels. The gender variables were two while they were compared on how often (Never, Rarely, Sometimes and Always) they engaged in facilities maintenance activities.

The study revealed that majority of the male teachers (67%) in the Cape Coast Metropolis indicated that their schools engaged in the replacements of worn out wires, light bulbs and switches sometimes and always. For the female teachers, the majority of them (66%) indicated that their schools always engaged in the replacement activity. The chi-square test showed that in terms of schools ensuring that the worn out wires, light bulbs and switches are replaced, there was no statistically significant difference in views of male and female teachers ($\chi^2 (15, n=205)=14.53, p>.05$).

The study revealed again that majority of the males (55%) and female (56%) of teachers indicated that their schools often engaged in the cleaning and washing of windows, doors, floors and dustbins. The chi-square test showed that there was no statistically significant difference in the views of male teachers ($\chi^2 (15, n=95)=10.19, p>.05$) as well as the female teachers ($\chi^2 (15, n=205)=11.63, p>.05$) in Cape Coast Metropolis.

In addition, the study showed that in terms of the repairs of broken school walls, windows, doors and roofing sheets, most of the male teachers indicated that their schools always engaged in such activity. Specifically, female teachers recorded 56% confirming that repairs were always done. Similar indications were made by male teachers. Specifically, male teachers (52%) made the claim that repairs were always done in their schools. The chi-square test, however, showed no significant difference in the views of male teachers ($\chi^2 (15, n=95)=11.96, p>.05$).

Further, it was found that the cleaning and removal of marks and spots on school walls were done some of the times. Majority of the male teachers (56%) indicated that this activity was always carried out. This was similar for the female teachers too recording 50%. The chi-square test of independence also revealed no significant difference in the views of male teachers ($\chi^2 (15, n=95)=15.21, p>.05$) and female teachers ($\chi^2 (15, n=205)=14.81, p>.05$).

Finally, it was shown with regard to sweeping and weeding school compound that for both male and female teachers in all the circuits, this activity was always carried out. For instance, all the male respondents in the Cape Coast Metropolis indicated that it was done always while 90% of the female respondents indicated the same. The implication is that weeding and sweeping of school compound was always carried out in all the schools surveyed. The chi-square test of independence, therefore, found no significant difference in the views of male teachers and female teachers ($\chi^2 (15, n=205)=10.87, p>.05$).

Discussion

This section summarises and discusses the research results with, an attempt to integrate results with existing literature in the area. The discussion was organised around the research questions and hypothesis in the chapter. The study revealed that the schools sampled always engaged in sweeping and weeding of school compound, repairs and cleaning of walls, windows, doors, roofing sheet and dustbins. However, the schools rarely engaged in washing, ensuring that marks and spots (graffitis) on school walls are cleaned, removed or painted. The results confirm what is obvious in most schools, sweeping and weeding are very common since they are the least expensive and are usually done by the students in the schools. Repairs were also done as and when they are needed. However, in most schools, painting and removal of spots (graffitis) on walls are not done much. In this sense, the findings can be deemed, to be honest responses from the respondents. It is clear that basic schools do not perform facilities conditional assessment to ascertain their needs which would inform them of the total cost to renovate and repair to an acceptable condition.

These findings are in support with the findings of Xaba (2012) that evidence of facilities maintenance at schools mainly relates to concerns with facilities repairs, (mostly 'as the need arises') and general campus cleanliness; mostly with emergency and corrective forms of maintenance as opposed to crucial preventive maintenance. Similarly, the findings of the study are in line with the findings of Ajayi (2007) that the common maintenance activities in schools include refusing and sewage disposal, plumbing works, sweeping and scrubbing. All these activities are aimed at ensuring that the school environment is well kept. All these findings supported the earlier view of Kenezovich (1975).

Kenezevich indicated that the walls in schools should be periodically repainted to give them a fresh new look, leaking roofs and collapsed ceiling boards should be repaired while cracked walls and broken floors need to be re-plastered. Also, broken doors and windows should be re-fixed. These findings point to the fact that facilities maintenance activities mostly have to do with repairs.

Furthermore, the study showed that most of the schools sampled had maintenance plans mainly to avoid and repair breakdown of facilities as well as replace damaged facilities highlighting the practice of plant replace and current plant value model of facilities maintenance. As such, maintenance activities are mainly geared towards repairs. However, most of the schools did not have maintenance plans involving the use of computer software to predict equipment failure based on age, user demand and performance measures. Most schools not using computer software to predict equipment failure could probably be due to the fact that the use of ICT in facilities maintenance is not common in Ghana, much less in basic schools. The findings are in line with the findings of Xaba (2012) that school facilities maintenance in South Africa did not generally involve organisational structures for planned facilities maintenance nor did they have policies on facilities maintenance. Thus, maintenance activities were mainly done as and when maintenance was required. Similarly, the findings confirmed the findings of Ropi and Tabassi (2014) that most of the school buildings do not possess their own maintenance management practices. The results of Ropi and Tabassi showed also that no preventive or planned maintenance was observed, and only emergency maintenance was applied when necessary. However, the implementation of planned maintenance practices was deemed more effective than unplanned maintenance, mostly because of the

reduction in repair costs. The implication of these findings is that even though having planned preventive maintenance activities, most schools only engaged in maintenance as and when they became necessary.

Conversely, the results of the study further revealed that the main sources of resources for facilities maintenance for the basic schools in the Cape Coast Metropolis were internally generated funds like PTA Levy as well as Capitation Grant. In most schools, PTA levies and support from the PTA are the first to be considered in facilities maintenance. This is more particular in cases where the funds from the capitation grant are not enough. However, most of the respondents did not agree to their schools receiving funds from NGOs and philanthropists for the maintenance of facilities. By implication, NGOs and philanthropists were not very supportive of school facilities maintenance. The findings confirm the findings of Wuni et al. (2018) that even though the responsibility of repairing the dilapidated buildings becomes the responsibility of the central government, it constitutes disruptions in the capital budgeting. Wuni et al. stated specifically that, public basic schools in Ghana heavily rely on capitation grant and Internally Generated Funds (IGF) to fund and maintain school facilities. This is especially so since government subvention and funds from all forms of fees and levies are usually inadequate (Asiabaka, 2008). This requires that head teachers look for alternative means of sourcing for funds within and outside the community (Yusof, 2007).

The study found that adequacy of funds was a major issue in the maintenance of school facilities. Most of the respondents did not agree that the funds required for facilities maintenance were adequate. Aside from this, the rate of inspection to detect damages was also a major issue in facilities

maintenance. Clear procedures for facilities maintenance was also an issue along with the provision of adequate insightful programmes to educate staff and pupils on embracing maintenance culture. All these factors have the potency of inhibiting school facility maintenance in schools. In Ghana, there have been several reports in the media of dilapidated school buildings and all these are mostly traced to the lack of funds in maintaining the buildings.

The findings confirm the findings of Wuni et al. (2018) who reported that facilities in the public institutions of Ghana are poorly managed and sidelined in the financial planning and capital budgeting of most public institutions in Ghana. It is in this sense that there exist dilapidated buildings and facilities in nearly all the public institutions of Ghana. Similarly, the findings are in consonance with the findings of Yusof (2007) who indicated that the failure of organisations to make facility management one of the top priorities coupled with the lack of professionals with technical expertise in the area is the greatest recipe for the poor facility management in Africa. Because facilities maintenance is not made a priority, funds appropriated for maintenance are not adequate. Yusof (2007) thus viewed insufficient funds as a major cause of poor facility management. This also corroborated the findings of Kamarazaly et al. (2013) that inadequate funding is the greatest recipe for poor facility management among public institutions.

Further, Jusoff et al. (2008) revealed that poor facility management is prevalent because most institutions do not have comprehensive management guides to regulate the conduct of facility management services and described facility management in Malaysia as 'not having standardised practice and implementation mechanisms. This was confirmed in the current study. In

addition, Blair (2004) revealed that poor facility management could be traced to inadequate facility management planning and funding.

The study showed further that students are likely to learn more and achieve at higher levels if the facilities in the school are in good condition. Again, the facilities in a school have the potency of affecting students' academic performance positively and make students learn in a friendly environment. From these findings, it can be pointed out that school facilities can have a positive impact on students' learning outcomes. The findings are in line with the findings of Earthman (2002) who revealed that the condition of school facilities has an important impact on student performance and teacher effectiveness. A more comfortable classroom atmosphere is related to efficient student performance. Brooks and Atkin (2002) also found that overall building condition was connected to student performance. This is possible because school building conditions influence teacher effectiveness and ultimately students' academic performance. The similarity among all the findings shows clearly that school facilities can have an impact on the academic performance of students. In addition, Al-Enezi (2002) noted that a positive significant relationship exists between student achievement scores and school facilities conditions in public high schools in Kuwait. This was possible because building conditions affect significantly the achievement of students. When the conditions in a school are favourable for teaching and learning, academic work is likely to improve positively.

In terms of the differences in the views of male teachers and female teachers' facilities maintenance activities of basic schools in Cape Coast, it was found that the male teachers often engaged highly in all the facilities

maintenance activities compared to female teachers. In terms of sweeping and weeding, both male and female are highly engaged in it. However, the same could not be said of the cleaning and removal of spots and marks. Regardless, the Chi-square test did not reveal a statistically significant difference across all the five facilities maintenance activities of the circuits. The findings imply that even though there were observed differences in the facilities maintenance activities of the gender, the differences were not statistically significant.

In line with the findings of the study, Amanchukwu and Nwachukwu (2015) observed that facilities cannot manage themselves except there is good leadership (male or female) that will set the ball rolling. Amanchukwu and Nwachukwu maintained that, leadership, whether in the primary, secondary schools and tertiary institutions, has a vital role to play in the maintenance of school facilities. Even though some of the activities cut across all schools such as sweeping and weeding, activities that were more demanding like repairs and paintings were done differently in different schools by different supervisors. In Ghana, a report by the GNA (2008) showed among different schools in different areas, facilities maintenance activities varied slightly. The maintenance culture in schools even though can be similar were at times marginally differently.

Chapter Summary

This chapter presented the results and discussion of the study. A sample of 300 teachers and six headteachers were involved in the study. Basic schools were found to be engaged in maintenance activities such as repairs, as and when there was a need for repairs. Internally generated funds were the main means of maintaining facilities. However, facilities maintenance was hindered by the inadequacy of funds. Facilities maintenance was deemed to be associated with

the academic performance of students. Male and female teachers in basic schools can engage in facilities maintenance activities within Cape Coast Metropolis.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

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 how basic schools' head teachers and teachers maintain their school facilities in the Cape Coast Metropolis. Specifically, the study sought to answer five research questions and one hypothesis.

Research Questions

1. How do basic schools maintain their facilities in the Cape Coast Metropolis?
2. What plans direct the activities of facilities maintenance of basic schools in Cape Coast Metropolis?
3. How do basic schools get resources to maintain facilities in Cape Coast Metropolis?
4. What factors inhibit school facility maintenance of basic schools in Cape Coast Metropolis?
5. How do school facilities maintenance activities promote students' learning achievements of basic schools in Cape Coast Metropolis?

Hypothesis:

H₀: Views of male teachers on school facilities maintenance activities are not significantly different from that of female teachers in Cape Coast Metropolis.

Literature related to the study was also reviewed on key areas such as school facilities, facilities maintenance activities, a source of financing maintenance activities and factors inhibiting facilities activities. A mixed method approach was chosen for the study. A sample of 300 teachers and six head teachers from 50 basic schools, within six circuits in the Cape Coast Metropolis, were selected via multistage and purposive sampling for the study. Data was collected through the use of questionnaires and interview guides. The quantitative data were analysed descriptively and inferentially while the qualitative data was analysed manually in themes.

Key Findings

Concerning the facilities maintenance activities of the various schools, the study revealed that the schools sampled always engaged in sweeping and weeding of school compound, repairs and cleaning of walls, windows, doors, roofing sheet and dustbins. However, the schools rarely engaged in ensuring that marks and spots (graffitis) on school walls are cleaned, removed or painted. Repairs were also done as and when they were needed.

The study also revealed that most of the schools sampled had maintenance plans mainly to avoid and repair the breakdown of facilities as well as replace damaged facilities. However, most of the schools did not have maintenance plans involving the use of computer software to predict equipment failure based on age, user demand and performance measures. In addition, the

study showed that the adequacy of funds was a major issue in the maintenance of school facilities. Most of the respondents did not agree that the funds required for facilities maintenance were adequate. Aside from this, the rate of inspection to detect damages was also a major issue in facilities maintenance. Clear procedures for facilities maintenance was also an issue along with the provision of adequate insightful programmes to educate staff and pupils on embracing maintenance culture.

Further, the study revealed that students are likely to learn more and achieve at higher levels if the facilities in the school are in good condition. Again, the facilities in a school have the potency of affecting students' academic performance positively and make students learn in a friendly environment. Finally, the study revealed that there was no statistically significant difference in the views of male and female teachers' facilities maintenance activities of basic schools in Cape Coast Metropolis. However, there were some observed differences in the extent to which the different gender-engaged in different maintenance activities. Specifically, male teachers highly engaged in facilities maintenance activities compared to the female.

Conclusions

Maintenance practice basically considers the necessary actions taken to prolong the life span of a particular resource. It does not only conserve a particular resource but also reduce maintenance cost in the long run and also prolong the safety condition of an asset. It is evident that basic schools engaged in maintenance activities such as sweeping, repairing windows and doors and plumbing. The poor condition of school facilities in Ghana can no longer be ignored. This research highlights the need to address the poor condition of basic

schools in the Cape Coast Metropolis. It is clear that more attention must be placed on maintenance, given the enormous problems in the school facilities. Faced with the prospect of growing educational system and the promise of a continued lack of financial resources to modernise school infrastructure for the decade, there is the need to reconceptualise the current model of facilities planning will be critical to the success of planning effort.

There is, therefore, a need for school facilities maintenance to be placed at the core of school programmes and since schools already compile school development plans, facilities maintenance should be regarded as one of the major strategic levers in the development planning processes. This will ensure that it is planned and budgeted for, and included in implementation plans of school development processes. A key responsibility of school administrators is facilities management. School buildings across the nation are ageing and becoming a barrier to optimal learning and teaching. This results in escalating school infrastructure costs. A case can be made to renovate or build new facilities that maximise an effective learning environment. This will involve the allocation of funds for building renovation or new construction.

Recommendations

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

1. The Ministry of Education should work through the Ghana Education Service to formulate policies that can guide a well-planned system of facilities maintenance so that basic schools do not wait until facilities break down before repairs are made.

2. Basic school administrators within the Cape Coast Metropolis should seek support from NGOs and individual philanthropists to help provide funds for facilities maintenance and not rely on only government.
3. Basic school administrators should establish school facilities maintenance committees so as to have some functional organisational structure for facilities maintenance, which will assist in determining systems for ensuring planned preventive, routine and corrective maintenance.
4. Basic school administrators should develop plans to direct and guide school facilities maintenance activities.

Suggestions for Further Research

Further study should be conducted to investigate private schools regarding facilities maintenance. The study may be replicated in other remaining districts and municipalities in Ghana. The researcher suggests that further research should add actual observation as part of the data collection instrument and procedures. This would help provide actual information concerning the state of school facilities as observed by the researcher.

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APPENDICES

APPENDIX A

School Facilities Maintenance Questionnaire for Basic School Teachers

This questionnaire is being administered as part of a study on investigating school facilities maintenance in basic schools in Cape Coast Metropolis.

This research is purposely for academic work and so your honest and sincere response would contribute a lot to the study. There are no 'right' or 'wrong' answers. Your identity would be held in confidence with regards to the information given.

Be sure to give a response for all statements. If you change your mind about any response, just cross it out and circle another. Some statements in this questionnaire are fairly similar to other statements. Don't worry about this. Please give your opinion about all statements by ticking [] in the box against your response.

PART ONE

BIO DATA OF TEACHERS

1. Sex: Male [] Female []
2. Level of Educational Qualification: Masters [] Bachelor [] HND []
Diploma [] Certificate []
3. Year of Service: <6 Years [] 7-12 years [] 13-18 years [] 19 year
and above []

PART TWO

SECTION A: SCHOOL FACILITIES MAINTENANCE ACTIVITIES

Please tick [√] the option that best reflects your response to the statement in relation to the above situation in your school. Key: Not at all = 1, Rarely= 2, Sometimes= 3, Always= 4.

No.	Statement	1	2	3	4
1	The school ensures that worn-out wires, light bulbs and switches are checked and replaced				
2	The school ensures that windows, doors, floors, and dust bins are cleaned and washed in the school				
3	The school ensures that broken school walls, windows, doors and roofing sheets are repaired				
4	The school ensures that marks and spots (graffitis) on school walls are cleaned, removed or painted				
5	The school ensures that the school compound is swept and weeded				

SECTION B: SCHOOL FACILITIES MAINTENANCE PLAN

Please tick [√] the option that best reflects your response to the statement in relation to the above situation in your school. Key: SD= Strongly Disagree (1), D=Disagree (2), A=Agree (3), SA=Strongly Agree (4).

No.	Statement	1	2	3	4
6	The school has a plan to maintain the facilities to avoid breakdown and ensure optimal performance of the facilities.				
7	The school has a maintenance plan to carry out urgent corrective measures or steps to replace damaged school facilities				
8	The school has a maintenance plan to repair broken-down school facilities.				
9	The school has a maintenance plan, which outlines the use of computer software to predict equipment failure based on age, user demand and performance measures.				

SECTION C: FACTORS INHIBITING FACILITIES MAINTENANCE

ACTIVITIES

Please tick [√] the option that best reflects your response to the statement in relation to the above situation in your school.

Key: SD= Strongly Disagree (1), D=Disagree (2), A=Agree (3), SA=Strongly Agree (4).

No.	Statement	1	2	3	4
10	There are inadequate insightful programmes to educate staff members and pupils on the need to embrace maintenance culture.				
11	There is inadequate and regular inspection to detect cracked walls, damaged furniture and other infrastructure (play grounds, canteen etc) for prompt repairs				
12	There are inadequate funds to purchase maintenance materials and pay for the labour cost				
13	There are unclear procedures to guide the school facility maintenance staff				

SECTION D: FINANCING SCHOOL FACILITIES MAINTENANCE

ACTIVITIES

Please tick [√] the option that best reflects your response to the statement in relation to the above situation in your school.

Key: SD= Strongly Disagree (1), D=Disagree (2), A=Agree (3), SA=Strongly Agree (4).

No.	Statement	1	2	3	4
14	The school receives funds from Capitation Grant for facilities maintenance				
15	The school receives funds from Non-Governmental Organisations to maintain the school facilities				
16	The school uses its internally generated funds such as (P.T.A Levy) for school facilities maintenance				
17	The school receives funds from Philanthropists for school facilities maintenance				

**SECTION E: RELATIONSHIP BETWEEN SCHOOL FACILITIES
AND STUDENTS' LEARNING ACHIEVEMENT**

Please tick [√] the option that best reflects your response to the statement in relation to the above situation in your school.

Key: SD= Strongly Disagree (1), D=Disagree (2), A=Agree (3), SA=Strongly Agree (4).

No.	Statement	1	2	3	4
18	The school has inadequate facilities for teaching-learning activities to help improve learning achievement				
19	Most students would not learn more and achieve at higher levels if the facilities are in good condition				
20	The school's facilities are not in good conditions which enable pupils to learn effectively in a friendly environment				
21	The school's facilities are not neat and in good condition impact positive teaching and learning.				

APPENDIX B

INTERVIEW GUIDE FOR HEAD TEACHERS

The interview guide examines how school facilities are maintained in Basic Schools in the Cape Coast Metropolis.

Your response will contribute greatly towards meeting this objective and shall be used only for the purpose of this study.

The confidentiality of your responses is assured.

1. What facilities maintenance activities do you undertake in your school?
2. Do you have any training in maintaining your school facilities?
3. How often do you carry out maintenance activities in your school?
4. a. Do you have any plan, which directs facilities maintenance activities in your school?
b. If yes, what procedures are outlined in the plan to guide the school maintenance activities?
c. If no, why?
5. What factors inhibit facilities maintenance activities in your school?
6. How do you finance facilities maintenance activities in your school?
(Identify the sources of funds)
7. a. Is there any relationship between facilities maintenance activities and students' learning achievement?
b. How do facilities maintenance activities relate with students' learning achievement?