STAKEHOLDERS' PERCEPTIONS ON THE PROVISION AND MAINTENANCE OF SCHOOL PLANT IN SECONDARY SCHOOLS IN KADUNA METROPOLIS, NIGERIA

BY

UDOSEN NAMSE PETER

MED/EDUC/1261/2011-2012

DEPARTMENT OF EDUCATIONAL FOUNDATIONS AND CURRICULUM, (ADMINISTRATION AND PLANNING UNIT)
FACULTY OF EDUCATION
AHMADU BELLO UNIVERSITY,
ZARIA

OCTOBER, 2015

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BEING A THESIS SUBMITTED TO THE DEPARTMENT OF EDUCATIONAL FOUNDATIONS AND CURRICULUM, EDUCATIONAL ADMINISTRATION AND PLANNING SECTION, FACULTY OF EDUCATION, AHMADU BELLO UNIVERSITY ZARIA, NIGERIA, IN PARTIAL FULFILLMENTS FOR THE AWARD OF MASTER OF EDUCATION DEGREE (EDUCATIONAL ADMINISTRATION AND PLANNING)

OCTOBER, 2015

DECLARATION

I hereby declare that this thesis titled, "Stakeholders Perception on the Provision and Maintenance of School Plant in Secondary Schools in Kaduna Metropolis, Nigeria" has been written by me in the Department of Educational Foundations and Curriculum (Educational Administration and Planning Section) under the supervision of Dr. E. I. Makoju and Dr. B. A. Maina. The original work is mine except as specified in acknowledgements and references and that neither the thesis nor the original work contained therein has been submitted to this University or any other institution for the award of a degree.

_____ _____

Udosen, Namse Peter **Date**
M.ED/EDUC/2011-2012

CERTIFICATION

This thesis titled "Stakeholders Perception on the Provision and Maintenance of School Plant in Secondary Schools in Kaduna Metropolis, Nigeria" by Udosen Namse Peter meets the regulations governing the award of Master of Education Degree (Educational Administration and Planning) of the Ahmadu Bello University, Zaria, and is approved for its contributions to knowledge and literary presentation.

_____ _____

Dr. E. I. Makoju **Date**
Chairman, Supervisory Committee

_____ _____

Dr. B. A. Maina **Date**
Member, Supervisory Committee

_____ _____

Dr. B. A. Maina **Date**
Head, Department of Educational
Foundations and Curriculum

_____ _____

Prof. K. Bala **Date**
Dean, School of Postgraduate Studies

DEDICATION

This work is dedicated to all Secondary School students in Kaduna State, Nigeria.

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ACKNOWLEDGEMENTS

First and foremost, I thank the Intelligent Designer, who created me from nothing and bestowed wisdom and knowledge upon me.

The researcher sincerely acknowledges the help, cooperation and encouragement of all those who in one way or the other contributed to the success of this research work. The researcher will ever remain grateful to his project supervisor, Dr. E.I Makoju and Dr. B. A. Maina who with deep sense of concern guided and corrected this work. My profound gratitude goes to Dr. Bashir Maina, the Head of Department who monitored the progress of this work right from the proposal stage. Special thanks also go to late Dr. M. O. Dare, whose contributions and materials really helped to advance the course of this work.

Special thanks go to my parents Mr. and Mrs. M.P. Udosen and Mr. and Mrs. M.D. Udosen for their financial contributions to this program. I also acknowledge the kind moral and financial support from my siblings; Ekom, Sandra, Yerima, Mrs Henshaw, Idy, Jane, Klemzy and Dennis. A word of thanks goes to Jacinta Ediba my research assistant, who tirelessly took the copies of questionnaire round the Secondary schools. At this point, I must thank all the respondents who took time out of their busy schedules to fill the questionnaire.

I give a special thanks to Saidi Imam, his wife and Abdulrasheed Salman for their great help in the typesetting and arrangement of this work. Kudos! I also thank Mr. Fabummi of the Faculty of Education library, University of Lagos for helping me with relevant materials for the research. I thank my friends and colleagues Dapo Babalola, Sly, Paul, Lawrence, Surajo, Mallam Hassan, Illiya and all others for their kind moral support and understanding when I was going crazy with the research.

ABSTRACT

This study assessed the provision and maintenance of school plant in secondary schools in Kaduna metropolis. The study as set to find out the provision of physical facilities in Secondary Schools in Kaduna Metropolis, investigate the maintenance of infrastructural facilities in Secondary Schools in Kaduna Metropolis, assess the of maintenance of instructional facilities for learning in Secondary Schools in Kaduna Metropolis, find out the provision of welfare facilities and find out the maintenance of sports and recreational facilities in Secondary School in Kaduna Metropolis. Ten research questions and ten null hypotheses were formulated to guide the study. Scholarly works of various scholars on provision and maintenance of physical facilities, infrastructural facilities, instructional facilities, welfare facilities and sports and recreational facilities were presented in chapter two. The descriptive survey design was employed in the study that covers all Secondary Schools in Kaduna Metropolis. Ten schools were randomly selected, while the respondents include 200 teachers, 10 principals and 20 staff of the Kaduna North Zonal Office of the Ministry of Education. Their responses were gathered using the questionnaire for the perception of stakeholders on the provision and maintenance of school plants (QPSPMSP)**.** To give the general description of data, frequency tables and simple percentages were used. The testing of the hypotheses was done using the analysis of variance (ANOVA) test. The results showed that school plants were inadequately provided and where they were provided they were not maintained. Some of the recommendations are that School administrators and government urgently need to upgrade school plants to meet up with modern demands of secondary school education. Digital facilities should be provided in schools and regular school inspection and good maintenance programme are recommended to protect the existing school plant.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Schools are usually set up to provide an environment for teaching and learning, the effectiveness of which requires several factors to be put in place. These factors include a good curriculum, well trained teachers, a good learning environment, teaching aids amongst others. It is generally agreed that the quality of education delivered by teachers and the academic achievement of students in any school is dependent on several factors of which school plant is paramount. Governments, private individuals and organizations in all states in Nigeria are increasingly involved in the provision of schools to meet the increasing demand for secondary education in Nigeria, secondary school enrolment has increased without a corresponding increase in the number of school plants required for effective teaching and learning. This has put a considerable strain on most secondary schools in Kaduna State.

The physical facilities that exist in the school system, which contribute either directly or indirectly to teaching-learning effectiveness constitute educational facilities or school plant (Asiyai, 2012). School plant refers to all physical facilities including buildings, classrooms, laboratories, libraries, recreational facilities, toilets, furniture. According to Undie (2007), school plant embraces the permanent and relatively permanent possessions of the school's resources such as laboratory equipment, white board, marker, generators, machines, tools and so on. It can be said that school plant means the school building, all materials, furniture and equipment attached and unattached to the building, all structures and features on the school site, including paths, roads, parking lots, playgrounds, open grounds, trees, flowers and

objects used for implementing or supporting the implementation of an educational programme (National Open University Of Nigeria, NOUN, 2012). School plant can be used synonymously with what some scholars refer to as school facilities. The Encyclopedia of Education (2012) adds that the school facility consists of not only the physical structures but also a variety of building systems such as mechanical, plumbing, electrical power, telecommunications, security and fire suppression systems. The school plant also includes furnishings, materials and supplies; information technology devices as well as various aspects of the school grounds namely sports fields, playgrounds, school farms and other areas for outdoor learning (Abdulkareem & Fasasi, 2012). Staff quarters, sickbays, dormitories, cafeterias and other auxiliary services buildings and components are also a part of the school plant. For Ajayi and Yusuf (2010), school plants comprise the following:

1) Machinery**:** It includes machines and tools used in the workshop, duplicating machines and so on.

2) School site**:** This refers to the entire landscape on which the school's permanent and semi-permanent structures are built.

3) Buildings**:** These include classroom blocks, administrative offices, libraries, workshops, laboratories, students, hostels, staff residential quarters, assembly halls, toilets dining hall and so on.

4) Equipment**:** These consist of typewriters, photocopiers, computers, sporting equipment, laboratory equipment and workshop equipment.

5) Furniture**:** Desks and seats used in the classrooms office furniture, residential furniture and soon.

6) Vehicles of various types and sizes.

7) Books, textbooks, periodicals and all library books.

8) Electrical infrastructure: Air conditioners, electrical fans, generating sets and other electrical fittings.

9) Water supply infrastructure**:** This involves deep wells, boreholes, water tanks and public water.

10) Accessories**:** These include playgrounds, lawns, parks garden and farm.

It is obvious then that constituents of a school plant are not static, but change from school to school and generation to generation. The school plant has been aptly described by Asiyai (2012) as the space interpretation of the curriculum. The curriculum finds its physical expression in the construction and arrangement of the school plant (Knezevich, 1976).

More specifically, building components include, but are not limited to: rooms, interior walls, interior doors, floors, plumbing, electrical systems, HVAC systems, kitchens, hardware, communications equipment (audio, video, and data), exterior envelope (walls and windows), roof and roofing materials, foundations and basements. Grounds include, but are not limited to: courtyards, unimproved fields, athletic fields, playgrounds and parking lots, campus roads, trees and shrubs and landscaping. Equipment includes, but is not limited to:

- fixed equipment (motors, compressors, telephones, computers)
- tools (lawn mowers, snow blowers, leaf blowers, drills)

- vehicle fleets (buses, vans, trucks, cars)
- supplies (motor oil, cleaning agents, pesticides, and other chemicals)
- signage
- traffic patterns (Planning guide for maintaining school facilities, 2003)

According to Adigun and Yusuf (2012), school plant refers to all non-consumable and durable physical and infrastructural facilities available in the school for teachers and students use in order to make teaching and learning effective and thus ensure the achievement of pre-determined aims and objectives of education hence, the school plant includes the space within the school premises which houses the basic systems and structures.

The number and types of equipment and materials available, the sizes of learning space within the school building, their relations to each other and nature of the learning environment all have influence on the methods and quality of teaching. Outside the school buildings and other structures, the size and nature of the school site determine to a great extent, the type of outdoor and recreational activities that can take place in the school (NOUN, 2012). The types of programme being run by the school and its educational philosophy determine the types and sizes of learning spaces provided in the school plant. For example, technical schools will have different school structures from commercial secondary schools. Religious secondary school (seminaries, Islamiya) will make provisions for chapels and mosques while a secular school will not deem them necessary. The equipment and instructional materials available in the school plant determines to a large extent how students are organized for instruction and the teaching methods adapted by teachers in the school.

The school plant is of special significance to learners, for students who are just entering the school for the first time in particular, the school building needs to be interesting and inviting (Cramer & Domian, 1960). The nature and look of a school plant, especially the buildings seem to be some of the important factors that influence students' attitude towards attending school and perhaps towards education as a whole (Xaba,2012). The school plant is used not only to provide conducive environment for both teaching and learning but also to ensure a safe, secure, hygienic and comfortable shelter for students, teachers and other staff as teaching, learning and other activities of the school take place. To keep the school plant in prime condition to provide the services it ought to be managed properly.

Maintenance is a holistic process of keeping a facility or equipment in prime condition and as close to its original state as possible. For school plants to remain effective for the purposes which they are provided for proper maintenance is required. This involves proper utilization, operation, custodial services performed on school building, equipment, furniture etc.

Since independence in Nigeria, secondary school enrolment has continued to increase without a corresponding increase in facilities for effective teaching and learning. This has put a considerable strain on school plants in most secondary schools in the country. The number of facilities like libraries, labouratories, tables, chairs, classrooms etc available for education remains inadequate for the eligible number of youths. This is more prevalent in urban areas where there is population pressure. Most of the school plants available today were not planned properly; hence provisions were not made for expansions, renovations, increased utility rate and other environmental factors. School buildings in use today were built some thirty to forty

years ago and cannot last for the next fifteen years, because they have not been maintained over the years and are now old and weak (Olaniyonu, 2006).

In Kaduna State, public secondary schools are managed by Federal or state governments. There are also a good number of privately owned and managed secondary schools in major cities in the state. Standards in all schools, by whosoever owned, are the exclusive responsibility of the federal government under the Nigerian constitution (Nwabueze, 1995). The efforts of the federal and state government seems not to have gone far enough towards providing adequate school facilities in Kaduna state as a recent observation of the Education Sector Support Programme in Nigeria (ESSPIN) shows, in respect of some schools that were studied by members of the group. According to ESSPIN (2009, page 45), "it is estimated that 75% of school infrastructure in the project states (Kaduna inclusive) is in very poor condition. The ESSPIN reported as follows:

> *… more of the school buildings are in poor conditions. One of the main reasons for the chronic situation is that the educational sector, particularly infrastructure, suffered from an approximately 20 year period of neglect during the military regime. The situation has been exacerbated by the fact that most of the buildings that have been constructed in recent years are also of very poor quality. They have been badly built because of poor procurement practices, poor management of construction, poor workmanship, the use of poor quality materials, and lack of supervision during construction…. Even when buildings have been constructed to an acceptable standard there has been a severe lack of maintenance which has resulted in many buildings being in a state of disrepair and having a reduced life span.*

Apart from these, the staff rooms of schools the researcher has visited are nothing to write home about. Other installations are old and obsolete, such as teaching aids, laboratory equipment, workshops and libraries where they exist at all.

The general picture presented by the conditions of school plants in Kaduna State is lack of adequate provision and maintenance. It has been speculated that procedures adopted in providing them have not been made explicit in literature, neither is there active participation of teachers, school heads and community citizens in planning and managing school plants. The general trend seems to be that the educational architect in a state or federal ministry of education produces prototype plans of school buildings, which are used for setting up the same type of buildings on different sites in different localities. Once the building project has been completed, inspected and taken over by the ministry of education, everything about its maintenance is usually forgotten (NOUN, 2012). Private schools are allegedly said to have better management practices.

The above observations and findings bring the researcher to the conclusion that there are problems with school plant provision and management in secondary schools in Nigeria and Kaduna State in particular.

1.2 Statement of the Problem

Many research point to the suggestion that the number of school plant available for secondary education remains inadequate for the eligible number of students in Kaduna state. The problem is more prevalent in urban areas like Kaduna metropolis where there is population pressure. Many schools are faced with challenges of inadequate provision and insufficient maintenance.

Every year the state government makes announcements on the provision of physical infrastructure such as school buildings and classrooms, yet many stakeholders have decried the insufficiency in quantity and quality of physical

infrastructure in many secondary schools in Kaduna metropolis. A survey by Ahmed, (2009) of secondary schools in Kaduna state revealed that 2% have partial roofs, 15% have their walls falling, 65% need doors to be repaired, and 25% have no windows in place. Commenting on why high academic attainment is not in vogue in Nigeria, Adesina (1981) identified poor and inadequate physical facilities, among others, as factors affecting academic achievement of students. There is a need to assess the current state of provision and maintenance of physical facilities in secondary schools in Kaduna Metropolis.

Reports in the press show that many secondary schools lack electricity and water supply. Other infrastructural facilities such water closets, ventilation, security and safety systems etc are also said to be lacking in most cases or insufficient and in poor states where they are available at all. Owuamanam (2005) in Asiyai (2012) noted that "the inadequacy of infrastructural facilities and lack of maintenance for available facilities were major problems facing the Nigerian educational system. The school facilities are grossly inadequate to match the student's population and the available facilities were poorly maintained." The availability of infrastructural facilities is important in improving teachers' morale and students' welfare.

It is very common for Educational administrators to pay attention to staff recruitment and curriculum development and other aspects of the school system to the neglect of equipment and items for teaching and learning such as furniture, boards, laboratory equipment and other teaching aids. Asibaka (2012) noted that "in many schools desks and chairs were not sufficient for the number of students enrolled. In some cases students stand or sit on the ground to receive lessons." Personal visits to schools by the researcher, shows, that many schools lack audio-visuals, models,

whiteboards and other modern teaching aids. This calls for an investigation into the provision and maintenance of items and equipment for teaching and learning in secondary schools in Kaduna Metropolis.

The Federal Government of Nigeria in the National Policy on Education (NPE), 2013) sets guidelines for setting up and operating secondary schools, but does not state clearly school plant designs, size, layout quality and quantity and construction requirements. Poor maintenance culture is a general characteristic of the Nigerian society. In educational institutions, it is evident in the conditions of school plant in most secondary schools. It is a common sight in Kaduna state to see classrooms with cracked walls, leaking roofs, falling ceiling, broken windows, unpainted walls, broken chairs, smashed tables, cracked floors etc. some even require urgent repairs to forestall their total collapse.

The proper use of facilities also elongates the life span of the school plant. Kochlar (1978) stated that using school plant for educational purposes requires careful direction or much of its effectiveness can be lost. It can be seen in some schools where chairs made for young students weighing less than 40 kg are used by adults weighing over 60kg during meetings. It also a norm for classes not related to sciences to be held in the science lab. In addition it has been observed that school heads do not make effective use of teaching aids, scientific equipment, I.C.T materials and learning spaces. It is in the light of the above problems that this study seeks to assess the provision and maintenance of school plants in secondary schools in Kaduna metropolis.

1.3 Objectives of the Study

This study aims at assessing the perception of stakeholders on the provision and maintenance of school plants in Secondary Schools in Kaduna Metropolis. The specific objectives are to:

1. Assess the provision of physical facilities in Secondary Schools in Kaduna Metropolis.
2. Assess the maintenance of physical facilities in Secondary Schools in Kaduna Metropolis.
3. Investigate the provision of Infrastructural facilities in Secondary Schools in Kaduna Metropolis.
4. Investigate the maintenance of Infrastructural facilities in Secondary Schools in Kaduna Metropolis.
5. Examine the provision of Instructional facilities in Secondary Schools in Kaduna Metropolis.
6. Examine the maintenance of Instructional facilities in Secondary Schools in Kaduna Metropolis.
7. Find out the provision of welfare facilities in Secondary Schools in Kaduna Metropolis.
8. Find out the Maintenance of welfare facilities in Secondary Schools in Kaduna Metropolis.
9. Find out the provision of sports and recreational facilities in Schools in Kaduna Metropolis.
10. Find out the maintenance of sports and recreational facilities in Secondary Schools in Kaduna Metropolis.

1.4 Research Questions

The following research questions were generated:

1. What is the perception of stakeholders on the provision of physical facilities in Secondary Schools in Kaduna Metropolis?
2. What is the perception of stakeholders on the maintenance of physical facilities in Secondary Schools in Kaduna Metropolis?
3. What the perception of stakeholders on the provision of Infrastructural facilities in Secondary Schools in Kaduna Metropolis?
4. What the perception of stakeholders on the maintenance of Infrastructural facilities in Secondary Schools in Kaduna Metropolis?
5. What is the perception of stakeholders on the provision of Instructional facilities in Secondary Schools in Kaduna Metropolis?
6. What is the perception of stakeholders on the maintenance of Instructional facilities in Secondary Schools in Kaduna Metropolis?
7. What is the perception of stakeholders on the provision of welfare facilities in Secondary Schools in Kaduna Metropolis?
8. What is the perception of stakeholders on the maintenance of welfare facilities in Secondary Schools in Kaduna Metropolis?
9. What is the perception of stakeholders on the provision of sports and recreational facilities in Secondary Schools in Kaduna Metropolis?
10. What is the perception of stakeholders on the maintenance of sports and recreational facilities in Secondary Schools in Kaduna Metropolis?

1.5 Research Hypotheses

The following hypotheses were formulated to guide the study:

$HO_{1.}$ There is no significant difference in the perceptions of stakeholders (Principals, Teachers and Staff of Ministry of Education) on the provision of physical facilities in Secondary Schools in Kaduna Metropolis.

$HO_{2.}$ There is no significant difference in the perceptions of stakeholders on the maintenance of physical facilities in Secondary Schools in Kaduna Metropolis.

$HO_{3.}$ There is no significant difference in the perceptions of stakeholders on the provision of Infrastructural facilities in Secondary Schools in Kaduna Metropolis.

$HO_{4.}$ There is no significant difference in the perceptions of stakeholders on the maintenance of Infrastructural facilities in Secondary Schools in Kaduna Metropolis.

$HO_{5.}$ There is no significant difference in the perceptions of stakeholders on the provision of Instructional facilities in Secondary Schools in Kaduna Metropolis.

$HO_{6.}$ There is no significant difference in the perceptions of stakeholders on the maintenance of Instructional facilities in Secondary Schools in Kaduna Metropolis

$HO_{7.}$ There is no significant difference in the perceptions of stakeholders on the provision of welfare facilities in Secondary Schools in Kaduna Metropolis.

$HO_{8.}$ There is no significant difference in the perceptions of stakeholders on the maintenance of welfare facilities in Secondary Schools in Kaduna Metropolis.

$HO_{9.}$ There is no significant difference in the perceptions of stakeholders on the provision of sports/recreation facilities in Secondary Schools in Kaduna Metropolis.

$HO_{10.}$ There is no significant difference in the perceptions of stakeholders on the maintenance of sports/recreation facilities in Secondary Schools in Kaduna Metropolis.

1.6 Significance of the Study

The former Nigerian Information and Research Council (NERC) which is today known as the Nigerian Educational Research and Development Council (NERDC) in May, 1986 made a nine point recommendation to enhance educational standard. Among the recommendations was the provision of adequate teaching aids and fund to provide other infrastructural facilities. It is hoped that the result of this study will help to raise the standard of education in schools having made useful suggestions on how to improve the provision and maintenance of the school plant.

This study will provide educational administrators and policy makers with a useful insight into how school plants in secondary schools in Kaduna are provided and maintained. It will give useful information on how to improve the provision in terms of quality and quantity of school plants and maintenance in Kaduna Metropolis which will in turn improve the quality of teaching and learning in schools. The Nigerian education system places much emphasis on academic and technical programmes requiring specialized facilities. As a result, the processing of educational

inputs (students) would demand for facilities that are at prime production. The realization of this lies in a well provided and maintained school plant. The students hopefully will benefit from a conducive and well-equipped environment which according to Adesina (1990) is a prerequisite for high academic performance.

This study will hopefully reveal to the government and school administrators the problems facing the provision of school plants and how they can be solved in secondary schools in Kaduna Metropolis and beyond. The study will thus propose the various contributions that government, school authorities, teachers and parents can make to ensure effective management of school plant in secondary schools. The government of Kaduna State today is interested in equipping the secondary schools with physical facilities. It is hoped that this work will expose the condition of the plant to the stakeholders whom it is believed will improve the quality and provision of school plant.

Nevertheless, if the recommendations of this study are implemented, the quality and quantity of school facilities in Kaduna metropolis will be greatly enhanced. It is the wish of the researcher that this study will motivate educational administrators at all levels to see the need to take part in best practices in school plant provision and maintenance as is done in other parts of the world. Finally the researcher hopes that this work will contribute to the sparse resources available on school plant provision and maintenance in Nigeria.

1.7 Basic Assumptions

In conducting this study, the researcher makes the assumptions that Kaduna Metropolis is home to many secondary schools so there is a policy or guideline for school plant provision and maintenance in Kaduna Metropolis. The researcher also assumes that there is a strategic plan from the Ministry of Education to carry out custodial activities in the various school plants within Kaduna Metropolis. This means that supervision of how school plants are operated is carried out and repairs are carried out when due. Finally is also assumed that Stakeholders (Principals, Teachers and Staff of Ministry of Education) will respond honestly and accurately to the questions raised by the researcher in the research instrument.

1.8 Scope of the Study

This study covers all secondary schools in Kaduna metropolis, but due to the copious number of secondary schools in the metropolis, a sample of secondary schools in the metropolis will be studied. Only schools owned by the state government will be considered in this research work.

1.9 Operational Definition of Terms

School plant: this is a generic term that refers to school physical facilities, infrastructural facilities, instructional facilities, welfare facilities and recreational facilities found in secondary schools.

School plant provision: the construction of buildings for use as classrooms, laboratories, libraries, fitting of electrical power supply, boreholes, plumbing and the supply of chairs, tables and teaching aids in schools.

School plant Maintenance: These are activities such as painting, refurbishing, repairing and replacing geared towards keeping the school plant working at optimal level.

Physical facilities: These are;

- classrooms,
- laboratories,
- Art Rooms,
- Libraries,
- PHE Class,
- Computer Room
- Technical workshop
- Agricultural farm
- Examination halls

Infrastructural facilities: These include;

- Electrical infrastructure
- Water supply
- Plumbing
- Sanitary
- Safety facilities
- Security facilities
- Aesthetic infrastructure
- Drainage infrastructure
- Paved roads

Instructional facilities: these include;

- Students' chairs and desks
- White board
- Specimen models
- Wall charts
- Digital Video (DVD) players & Televisions
- Projectors and Interactive boards
- Laboratory equipment
- Workshop equipment

Welfare facilities: these include;

- School bus
- Health facilities
- Canteen/food shops
- Staff quarters
- Furniture for teachers
- Staff room
- Staff toilet
- Parking lot

Sports and recreation facilities: they include;

- Football pitch
- Volleyball court
- Basketball court
- Table tennis table

- Internet facilities
- Lawn tennis court
- Athletics track
- Swimming pool

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

The provision and maintenance of school plant are essential aspects of secondary school management. It is one of the core functions of school and educational administrators. This research work assesses the provision and maintenance of school plants in secondary schools in Kaduna metropolis. This chapter intends to review relevant literature along the following lines:

i. Conceptual Framework
   - What is school plant?
   - The concept of provision of school plant
   - The concept of school plant maintenance

ii. Theoretical framework
   - Systems theory

iii. Physical facilities in secondary schools

iv. Infrastructural facilities in secondary schools

v. Instructional facilities in secondary schools

vi. Welfare facilities in secondary schools

vii. Sports/recreational facilities in secondary schools

viii. Empirical studies

ix. Summary of the literature review.

2.2 Conceptual Framework

This section provides insight into the major concepts found in the research topic. Key terms are expounded to provide insight into the topic.

2.2.1 The Concept of School Plant

The term school plant refers to the school site, the buildings, the playgrounds, the equipment and other material resources provided in the school for effective teaching and learning operations. According to Abraham (2003), school plant means all physical facilities and equipment within the school, which are used by members of the school community. All the physical structures in the school fall within this category. Facilities are plants (buildings) equipment, materials etc, (Ehiemetalor, 2001). Whereas, school buildings according to Olutola (1982) include classroom, dormitories, libraries and laboratory buildings, staff rooms, teachers' quarters, examination halls and administrative buildings; educational equipment include such items as machines, audio-visual materials, chalkboards, cleaner's tools and workshop equipment. Osahon (1998) provides a much more comprehensive list of educational facilities and grouped them into two viz:

1) **School buildings:** These are tangible structures, which serves as shelter for educational activities. They include among others, classrooms, laboratories, workshops, teachers' common rooms/offices, toilets, rest rooms, reading rooms, dispensaries, libraries, hostels/dormitories, dining halls, assembly hall, staff quarters etc.

2) **Equipment:** School equipment refers to facilities or outputs such as machine and tools, which ease the operation of academic activities. Various equipments are required in:

a) **Classrooms:** desks, chairs, blackboards, cupboards, shelves, dusters, wash hand basins, napkins, teaching aids etc.

b) **Laboratories:** physics, chemistry, biology, agricultural science, languages, geography etc.

c) **Workshop:** woodwork, metalwork, machineries, electronics/electrical, business studies etc.

d) **Sports/games:** football, table-tennis, volley ball, net ball, hockey, tourniquet, short put, high jump stands/crossbars, javelin, hurdles, trophies, jersey, bells, notice boards, electric generator, typewriters, photocopying machines, computers etc.

Ani (1997) defined school plant as the location of the school buildings, the equipment in the school and other material resources provided in the school for the purpose of enhancing teaching and learning processes. To him school plant includes the fixed and mobile structures and materials in the school such as the classroom buildings, laboratories and laboratory equipment, the school furniture, the chalkboards, tools and machines, the chalk, audio and visual aids etc.

School plant can also be taken to mean the site where the school programmes and activities take place or the environment where the school curriculum is implemented. Thus Ezegbe & Obi (2002) defined school plant as the space interpretation of the school curriculum. In other words, school plant can be said to be physical expression of the school programmes and activities. It is a consciously designed and controlled environment with the sole aim of promoting teaching and learning activities within the school. It is putting together of facilities to protect the

physical well being of the individuals associated with the school. School facilities are the operational inputs of every instructional programme. The school is like a manufacturing organization where plants and equipment must be in a top operational shape to produce result. Efficiency in the production function depends on the quantity and quality of the facilities. Since the facilities are used in one way or the other in the day-to-day business of the school, there is need for its proper management.

2.2.2 The concept of Provision of school plant

The Merriam-Webster online encyclopedia describes provision as "the act or process of supplying or making something available. Winston (2013) defines it as "the action of providing or supplying something for use." It can further be expanded to mean the amount of a thing supplied. To provide also means to make something available for use (Ricket, 2012). School plant planning is a foundational aspect of school plant provision. The basic concept behind school plant provision is a simple one: according to Chan (1999), "a school building is primarily a school and secondarily a building. If the school plant is not planned in terms of its purposes, its scope and its programs, the resulting structures will almost certainly be just a "building"." He further asserts that "no architect, regardless of talent or experience in school plant design can plan a school without guidance from educators who will use it.

While emphasizing the importance of school plants' planning to students' learning outcomes, Ajayi and Yusuf (2010) stated that the main objective of school plant planning is to satisfy educational goals which have been pre-determined by educational planners. Ajayi, (1999) further emphasized that better planned school plants will enhance school programmes and the community needs by providing a

place for psychological and physical safety for students and teachers and enhancing the good quality and quantity of instruction.

Planning involves decision making for future actions. Abdulkareem and Fasasi (2012) and Asiyai (2012) assert that decision has to be made on facilities to be provided in order to ensure relevance, adequacy and quality. Ajayi and Yusuf (2010) emphasized that the aim of school plant planning is to lay a solid foundation for educational structure in order to achieve educational goals and satisfy the physical and emotional needs of the learners and to provide for future expansion of the school system. Undie (2007) described school plant planning as "the conscious process of determining how these facilities are to be distributed, utilized and maintained in order to enhance their utility as well as prolong their life span. He further explains that it is an ongoing process that seeks to ensure optimal use of educational resources to achieve desired educational goals.

Dare (2012) opines that planning cannot be carried out in isolation of other elements of management such as organizing, coordinating, controlling and commanding. "The aim of school plant planning is to determine the most rational use of school facilities, to reduce wastage associated with under utilization vis-à-vis over utilization" (Abdulkareem & Fasasi, 2012). Asiabaka (2012) suggests that "a plan for facilities must be an integral part of the overall federal, state and local government educational master plan." The researcher believes that it should also apply to private school proprietors. Asiabaka (2012) goes on to assert that "school plant planning is a well articulated conceptualization of the educational philosophy, goal, objectives and specification for short and long term objectives including implementation of the planned curricula and extra-curricular activities." Dare (2012) adds that "planning for

the realization of educational objectives should be realistic in order to avoid the menace of failure, disappointment and frustration."

Odofowokan (2011) posits that "the planning and execution of a school plant should take into consideration the total space available to it." Accordingly, a school that is cited on an acre of land will have more space than another cited on two plots of land. While it is possible for us to ride within some schools, you can hardly trek within some; Odofowokan (2011) concluded that the more spacious a school, the more healthy are the students. Xaba (2012), Asiabaka (2012), Undie (2007) all posit that "school plant provision begins with a statement of educational philosophy. Such statement should set forth clearly the educational goals and objectives." Earthman (2002) added that "these objectives are derived from a thorough study of the educational needs of the community served by the school." Dare (2012) and Nwangwu (2005) categorically asserted that "school plant planning (and provision) cannot meaningfully be carried out without accurate data.

Also, Earthman (2002) suggests that "school administrators can glean a wealth of information on which to predicate school plant needs by means of census reports, public utility company statistics (PHCN, Water board), population trends, school records, tax records, budgetary information etc." Asiabaka (2012) added that "accurate data for planning could also be collected through facility audit. According to Szuba and Young (2003), "facility 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 plant. It provides information on the status of the school plant.

It is carried out by assessing buildings, grounds and equipment, and documenting the findings. “Planning for the provision of a functional school plant is a complex task. It involves putting up functional buildings and other structures that will be adequate for present and possible future use and that will provide a conducive setting for effective teaching and learning” (NOUN, 2012). Dare (2012) asserts that “right from the inception school plant planning should emphasize on the quality of materials required for an effective school plant project.” This means that the quality of materials used for the construction of the school plant determines to a large extent its strength and life span. Nakpodia (2012) posits that “in planning of school plant in Nigeria, economy and efficiency of building materials must be taken into consideration.” If these considerations are ignored, there is the probability that the effectiveness of maintenance of the physical plant will be limited.

Aribiyi (1995) opines that “economic consideration is a pointer to the provision of suitable facilities at low cost, which is often backed by efficient designs of school buildings.” Essentially school buildings are designed to meet the educational programme requirements and satisfy the students’ and teachers physical and emotional needs (NOUN, 2010). As earlier stated, the quality of instruction given to the students by the teachers depends on the type of school building, infrastructural facilities and learning environment. This is the reason why it is emphasized that school plants should be adequately considered and planned effectively to allow for effective teaching and learning.

2.2.3 The concept of school plant maintenance

Maintenance is a word that occurs frequently especially is discourse that has to do with equipment and infrastructure. Rodgers (2012) posits that maintenance refers

to the process of conserving a situation or condition of machines and equipment to increase their efficiency and performance. Szuba and Young (2003) writing on facilities management opines that "maintenance is concerned with ensuring safe conditions for facility users." Gaither (2003) views maintenance as "all actions which have the objective of retaining or restoring an item in a state in which it can perform its required function. The actions include the combination of all technical and corresponding administrative, managerial and supervisory action." This fully puts in perspective the whole gamut of maintenance. Rossler (2013) adds that it involves fixing any sort of mechanical, plumbing or electrical device should it become out of order or broken. It can be extended to stationery such as books, files, pencils, pencils etc. maintenance is essential for keeping equipment, buildings and other infrastructure in good conditions.

An aspect of school management that is generally overlooked is facilities maintenance. Dare (2012) opines that maintenance of school plant is concerned with keeping grounds, building and equipment in their original condition of completeness for efficiency. Xaba (2012) and NTI (1992) add that school facilities maintenance basically relates to the repair, replacement and general upkeep of physical features as found in school physical facilities, equipment and infrastructural facilities. Szuba and Young (2003) make the point that maintenance is concerned with ensuring safe conditions for facility users, be they students, educators, staff, parents or guests, and is also concerned with creating a physical setting that is appropriate and adequate for learning.

Asiabaka (2012) points out in this regard that facility maintenance relates to resource integration with the emphasis on the provision of an enabling working

environment. Xaba (2012) and the United State Department of Education (USDE) (1998) provide a rounded-off definition of school plant maintenance by stating that "a school maintenance programme is an organizational activity carried out by the school system in order to prolong the life expectancy of school buildings, its furniture and equipment for normal use, and should be systematic and pro-active. National Teachers Institute (NTI) (1992) and Dare (2012) assert that plant maintenance is imperative so that the school plant can be kept very close to the state of originality. NTI (1992) also equips that the regularity of maintenance are designed to keep the school plant operating at its optimal level so as to reduce the breakdown of equipment.

School administrators have an active role in the maintenance of school plants. Deighton (1971), Nwangwu (2005), Ani (1997) and Nwogwu (1997), in their separate studies have confirmed the roles of the school administrators towards the maintenance as:

- The identification of plant that need repairs
- The establishment of a repair inventory
- The establishment of a maintenance workshop
- Renovation of dilapidated school plant
- Appointment of staff to custodian duties
- Instruction to students on the careful use of the school plant, preventing students from damage or defacements through writing or drawing on the wall.
- Ensuring that school plants are adequate for student population.
- Supervising school custodial staff
- Providing working materials for the custodial staff

- Reporting all major problems to the government or relevant authority on time
- Teaching students to treat plants on personal properties instead of government facilities.

As stated earlier, maintenance refers to keeping of the school plant, in as near as their original state. NTI (1992) posit that all parts of the school plant continually depreciate. Depreciation begins from the day the new building is taken over and is constantly undergoing that process throughout its life. There are four factors responsible for depreciation. They are:

i. Tear and wear of usage
ii. Physical decay
iii. Obsolescence – growing out of utility
iv. Accident and natural disasters

Szuba and Young (2003) add that "the depreciation of the school plant or part of it does not proceed at the same rate. The rate of depreciation varies in the quality of workmanship, the climatic conditions of the location of the school and carefulness in use of the plant. Depreciation is inevitable and cannot be entirely eliminated. The school system can retard depreciation through thorough and careful maintenance.

Types of Maintenance Services

Asiabaka (2012), Xaba (2012), NTI (1992), Fobis (2006) posit that there are four interrelated maintenance services. These are preventive, routine (regular), emergency and predictive maintenance.

a) **Preventive Maintenance:** This is a type of maintenance carried out on school facilities to avoid breakdown and ensure optimal performance of the facility

(Asiabaka, 2012). NTI (1992) in conjunction posits that these are maintenance services that are performed on a continuous basis by the maintenance personnel. Preventive maintenance saves cost and time. As the saying goes, "prevention is better than cure and a stitch in time saves nine, so the purpose of preventive maintenance is to reduce the likelihood of repairs or breakdowns of equipment. In the words of Asiabaka (2012), it is usually an integral part of the management practice in societies where maintenance culture is well established.

b) **Routine Maintenance**: This is carried out periodically as scheduled by the school manager. NTI (1992) adds that they are those maintenance services which are performed on a periodic basis on specific equipments or school facilities. They are the services which are carefully designed to keep the equipment operating at an optimal level and to reduce the incidence of breakdown or major repairs. Routine maintenance includes changing oil and cleaning engines of vehicles and generators, servicing air conditioners. Manufacturers guide provide information on the nature and maintenance intervals. School managers should comply with these guidelines to avoid breakdown of the equipment (Asiabaka, 2012).

c) **Emergency Maintenance**: - This takes place when a facility breaks down and urgent measures or steps have to be taken to remedy the situation. According to University of California Santa Cruz (UCSC) Physical Plant manual (2004), Emergency maintenance is concerned with the repair or replacement of facility component or equipment requiring immediate attention because the functioning of a critical system is impaired or because health, safety or security of life is endangered. Emergency maintenance could result from natural disasters (storms,

heavy rain, and earthquake) civil disobedience, vandalization or irregular preventive maintenance.

d) **Predictive Maintenance**: Xaba (2012) describes predictive maintenance as maintenance that forecast the failure of equipment based on age, user demand and performance measures, this kind of maintenance according to Gaither, (2003) is rooted in the proper execution of a facilities and which aims to assist school in avoiding emergencies and drastically reducing damage.

In summary, all types of maintenance services are inter dependent on each other. Preventive and predictive maintenance eases the duty of routine maintenance and thus reduces the incidence of emergency maintenance. Under the guise of "saving money," many school districts (and other organizations for that matter) practice what is known as "breakdown maintenance"—a maintenance program in which nothing is done to a piece of equipment until it breaks down. And then, after the equipment breaks, the least expensive repair option is used to return the equipment to service. While this may sound like a cost-saving approach to maintenance, precisely the opposite is true. Breakdown maintenance defers repairs and allows damage to accumulate, compounding an organization's problems. On the other hand, regularly scheduled equipment maintenance not only prevents sudden and unexpected equipment failure, but also reduces the overall life-cycle cost of the building, equipment or machine.

Engman in Earthman (2002) describes the details in which a good maintenance programme must be provided as follows:

> *A good maintenance program provides for the tightening of each bolt as it becomes loose. It anticipates maintenance needs rather than waiting until deterioration or damage requires urgent replacement or repair. Such a program is also planned and scheduled. The initial maintenance plan*

> *may be established by a careful inspection of each interior space and the exterior of each building. Survey sheets for the inspection may provide space for report on the condition of the painting, walls and ceiling, floors, lighting fixtures and electrical system, plumbing fixtures, heating fixtures, window and window shades, boards, furniture and other equipment. Attention needs should be noted on the survey sheets as immediate, within the near future, eventually, or no comment. When such information is collected along with information concerning the maintenance needs of exterior painting, waterproofing, repainting, roof repairs; gutters and rain spouts, and the like, it is possible to lay out a schedule of maintenance work to be accomplished over a period of years. Such a program will provide a regular schedule for interior and exterior painting. It will provide regular service to various pieces of school equipment. (p.104)*

According to Szuba and Young (2003), "a good maintenance program is built on a foundation of preventive maintenance. It begins with an audit of the physical facilities, infrastructural facilities, and equipment. Once physical facilities data have been assembled, structural items and pieces of equipment can be selected for preventive maintenance. Manufacturers' manuals are a good place to start when developing this schedule; they usually provide guidelines about the frequency of preventive service, as well as a complete list of items that must be maintained. Many manufacturers will assist customers in setting up preventive maintenance systems (if for no other reason than they get the additional business of selling replacement parts). Once the information is assembled, it must be formatted so that preventive maintenance tasks can be scheduled easily."

Principles of School Plant Maintenance

For proper maintenance of the school plant, there are principles that should guide school administrators in the development of the standard repair programme. Xaba (2012) postulated the principles as:

- Maintenance organization which relates to creating an organizational structure for facilities maintenance. NTI (1992) posits that the responsibilities of all personal concerned with maintenance should be clearly defined and job descriptions be developed for all maintenance personnel. Ehiametalor (2001) provides more insight stating that "since school facilities management is the responsibility of the school governing body, it must establish a school committee for facilities maintenance, which would be responsible for ensuring regular maintenance and repairs.
- Maintenance inspection which relates to school building examination in order to prepare a school maintenance plan and most importantly, gather information for form the basis for the maintenance programme using various forms of inspections checklist for building structures including roofing, building envelope, ground and service systems (Bastilis in Xaba, 2012 p.62).
- Maintenance planning, which relates to formulating a maintenance strategy for achieving better use of school facilities and minimizing the cost of resources tied up in grounds and building (Scottish Executive, in Xaba, 2012). Maintenance planning invariably includes maintenance policy formulation and aspects of maintenance funding (Priestly and Howard in Xaba, 2012). A sound facilities maintenance plan serves as evidence that school facilities are, and will be, cared for appropriately. On the other hand, negligent facilities maintenance planning can cause real problems. Large capital investment can be squandered when buildings and equipment deteriorate or warranties become invalidated. Failing to maintain school facilities adequately also discourages future public investment in the education system.

- The entire maintenance programme should be renewed periodically to identify methods by which efficiency can be improved.

In summary, the maintenance of school plants and facilities can be summarized below:

Physical Facilities Maintenance

- Annual Painting of interior and exterior walls.
- Routine Repair of sports equipment, fences, and other outdoor facilities.
- Remove all marks from walls and lockers nightly.
- Daily Cleaning and mopping of floors in the classrooms, library, laboratory and other physical plants.
- Monthly Vacuum or clean all intakes and exhaust ventilating louvers in ceiling of every room
- Close and lock windows.
- Wet mop tiled areas. Wax, if needed.

Infrastructural facilities: This function includes maintaining mechanical, electrical, structural, and technical and life safety system. They can automatically turn on and off air conditioning, lights, and other appliances according to pre-programmed instructions entered by facilities staff. Other responsibilities include:

- Thoroughly clean all surfaces in restrooms.
- Daily washing and disinfecting of toilets and urinals
- Weekly washing of water filter
- Clean ceiling fans in classrooms, offices, etc.
- Daily check barbed wire fences for breeches

- Repair simple plumbing leaks in faucets, sinks, etc. Remove minor drain blockages in sinks, water coolers, etc

Instructional Facilities Maintenance:

This function involves maintaining the running of educational media in a safe, orderly, clean and visually appealing manner in support of various activities. It includes:

- Regularly Wash all desktops, chairs, and furniture according to schedule.
- Wash whiteboards weekly with whiteboard cleaner
- Vacuuming and dusting of wall charts
- Washing and cleaning of laboratory and other special apparatus at least monthly
- Regularly changing defaced or worn out wall charts (adapted from Florida Department of Education, 2012)

General Maintenance Practices include:

- Monthly fumigation and pest control
- Replace defective lamps (lighting fixtures, exit lamps)
- Repair furniture including desks and chairs, bookcases, cabinets.
- Replace chair and desk glide.
- Replace cove base, ceiling panels.
- Replace damaged desks and seats.
- Simple repairs of lock and hardware repairs for doors and windows, door closers, etc.
- Monitor HVAC equipment, thermostats, etc. and reset controls when needed

- Remove and dispose of trash and debris in surroundings and on roofs.
- Preventive maintenance and repair of custodial equipment such as wet and dry vacuum machines, floor machines, lawn mowers, string trimmers, etc.

2.3 Theoretical Framework

The Systems theory

Systems theory is an interdisciplinary theory about the nature of complex systems in nature, society, and science, and is a framework by which one can investigate and/or describe any group of objects that work together to produce some result. This could be a single organism, any organization or society, or any electro-mechanical or informational artefact. In the opinion of Bailey (2004), "the central focus of systems theory is self-regulating systems, i.e. systems self-correcting through feedback." Bánáthy (1996) in explaining systems posits that, "Self-regulating systems are found in nature, including the physiological systems of our body, in local and global ecosystems, and in climate—and in human learning processes (from the individual on up through international organizations like the UN). It can therefore be deduced that systems can be employed in any form of organization, schools not exempted.

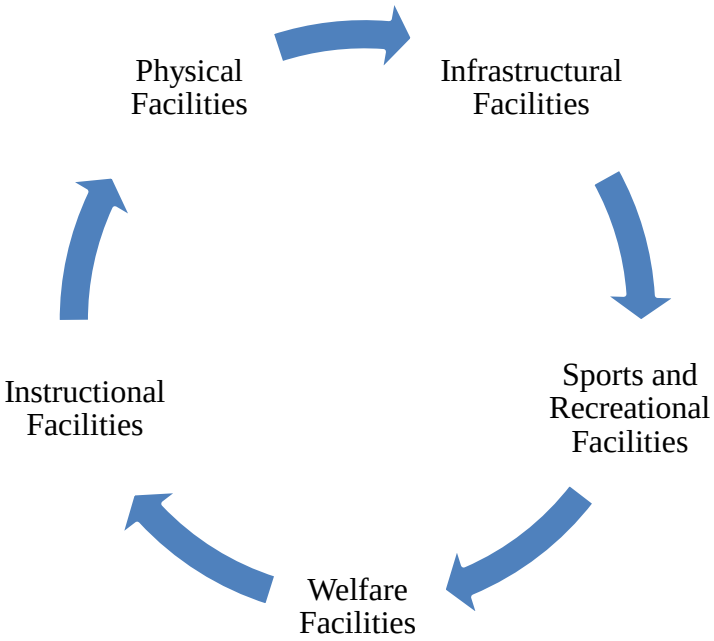
According to Bausch (2001), the systems view is a world-view that is based on the discipline of system inquiry. Central to systems inquiry is the concept of system. In the most general sense, system means a configuration of parts connected and joined together by a web of relationships. The Primer group defines system as a family of relationships among the members acting as a whole. Von Bertalanffy in Odia and Omofonwan (2007) defined system as "elements in standing relationship." Cliff and Francis (2013) add that contemporary ideas from systems theory have grown within

diverse areas, as demonstrated by the work of biologist Ludwig von_Bertalanffy, linguist Béla H. Bánáthy, sociologist Talcott Parsons, ecological systems with Howard T. Odum, organizational theory and management with individuals such as Peter Senge, and insights from educators such as Debora Hammond and Alfonso Montuori. Charlton and Andreas (2003) stated:

> *Systems theory was proposed in the 1940's by the biologist Ludwig von Bertalanffy, and furthered by Ross Ashby. Von Bertalanffy was both reacting against reductionism and attempting to revive the unity of science. He emphasized that real systems are open to, and interact with, their environments, and that they can acquire qualitatively new properties through emergence, resulting in continual evolution. Rather than reducing an entity (e.g. the human body) to the properties of its parts or elements (e.g. organs or cells), systems theory focuses on the arrangement of and relations between the parts which connect them into a whole. This particular organization determines a system, which is independent of the concrete substance of the elements (e.g. particles, cells, transistors, people, etc). Thus, the same concepts and principles of organization underlie the different disciplines (physics, biology, technology, sociology, etc.), providing a basis for their unification. Systems concepts include: system-environment boundary, input, output, process, state, hierarchy, goal-directedness, and information. (p.86)*

A system within the context of school plant provision and maintenance can contain regularly interacting or interrelating groups of activities such as site selection, building plans, construction, fittings and equipping. The system theory recognizes that schools are complex social systems and that reducing the parts from the whole reduces the overall effectiveness of the organization. This means that rather than basing the provision and maintenance of school plants on individual structures, departments or units, separate in part from the whole school administrators should recognize the interdependence between groups of individuals, structures and processes that enable the school organization to function properly.

Figure 1: Interaction of School Plant



Sources: Researcher (2015)

The figure above shows the interaction of the different components within the school plant. There is a continuous relationship between physical facilities, infrastructural facilities, sports and recreational facilities, welfare facilities and instructional facilities which makes the school plant system operate optimally.

2.4 Physical Facilities in Secondary Schools

Physical facilities have a profound significance as part of the school plant in secondary schools. They provide a frame for all other aspects of the school plant. Many research findings have shown that the success of any educational endeavour rests on the availability of physical facilities especially the school building. Writing on its importance, Adegbija, and Onasanya (2007) unanimously opined that the availability of the school building and other plants contribute to good academic performance as they enhance effective teaching-learning activities. Ayeni and Adelabu (2012), writing on the provision of learning infrastructure posit that "the

provisions of adequate and appropriate school physical facilities are indispensable in the educational process, where the school is located therefore, determines to a large extent the academic standard of a school. The school should be located where it is accessible and far from disturbance of markets, highways, airports and industries and free from filth and pollution. The environment of the school should stimulate, motivate and reinforce students' attendance in school."

Zaki (1988) and Iqbal (2005) suggested the following physical facilities in a school building: classrooms, gymnasiums, library, laboratory, arts room. The number of rooms depends on the physical facilities provided in the school. Normally each section of the class should have a separate room. School rooms can be divided into the following:

- Instruction Rooms such the classrooms and laboratories
- Non-instruction rooms as offices, staffroom, and library rooms, sports room etc.

The United States Department of Education, National Center for Education Statistics (NCES, 2012) states that "the fundamental physical facilities for secondary school include, but are not limited to:

- Administrative buildings
- Auditorium
- Art rooms
- Classrooms
- Courtyards
- Gymnasium
- Health services

- Libraries
- Media centre – schools are changing traditional libraries into media centres, adapting to new technology.
- Multipurpose rooms
- Music rooms
- Science facilities (laboratories)

Secondary schools' physical facilities can be designed in a variety of ways, sizes, configurations and layouts depending on the school district and program. Many research findings have shown that the success of any educational endeavor rest on the availability of physical facilities especially the school building. In addition, Adesina (1990) stressed that the quality and quantity of physical facilities available within an educational system positively correlates with the quality and standard of the educational system. Writing on its importance, Olutola (1982), noted that the availability of the school building and other physical structures contribute to good academic performance as they enhance effective teaching-learning activities. He further stated that "well sited school buildings with aesthetic conditions in classrooms, libraries, and other buildings for learning usually contribute to achieving higher educational attainment." Expanding further on this, the Encyclopedia of Educational Research observed that "the total environment within a school building should be comfortable, pleasant and psychologically uplifting.

Thus, it should provide a passive physical setting that is educationally stimulating. It should produce a feeling of well-being among its occupants, and it should support the educational process. The above conditions can only be met through the cooperative efforts of imaginative teachers, administrators and a creative

knowledgeable architect." Akinwumiju and Orimoloye (1987) opined that "education institutions from Nursery to University require buildings for their effective operations. Classrooms, offices, assembly halls, laboratories and staff quarters are needed and should be provided in adequate in number and they should all be in good conditions for schools to function properly." According to Hallak (1990), physical facilities form one of the potent factors that contribute to academic achievement in the school system. He went further to say that their availability, relevance and adequacy contribute to academic achievement. He however, also added that, "unattractive school buildings and overcrowded classrooms among others contribute to poor academic attainment.

Describing where these facilities should be located, he ascribed that educational facilities should be located in appropriate places, while the needs of the users should be put into consideration. In another development, Aliyu (1993) as cited by Johnson (1998) found that there was no significant difference between students in secondary schools with and without adequate physical facilities. However, he submitted that Physical facilities were indispensible to academic achievement of students in English Language, Mathematics, Biology and Geography while students could perform well in other subjects without adequacy of sophisticated physical facilities. He concluded that the effect of physical facilities on students' academic performance is more felt in pure and social sciences.This implies that physical facilities should be provided in line with the subjects being taught in the school and emphasis in provision should be in pure science areas.

There is no point in providing a typing pool when commercial subjects are not offered in the school or a gym when physical education in not a core program of the

school. Alabi (2012) in addendum opines that "The basic physical facilities provided in each school include student accommodation, classrooms, health care facilities, workshops and laboratories, administrative facilities, equipment and furniture as well as municipal services. The requirement for provision varies from school to school but there are broad guidelines from the ministry of education as prescribed minimum space requirements; for offices, dormitory, classrooms, laboratories, seminar, conference rooms and academic staff offices. The standards for teaching accommodation are commonly expressed in one of three ways. In countries where open-plan has become common then a typical standard is in the following form:

Table 1: Typical Space for Open Plan Schools

Number of students	Minimum teaching area in sq.m
240	602
280	703

Source: (UNESCO1995, Module III Section 2 Pg. 14)

Where countries are firmly wedded to the use of separate teaching spaces, the most common standard is one which prescribes the areas to be provided per place.

Table 2: Standard Teaching Space and Area per Place

Type of school	Classroom	Laboratories	Arts and crafts
Primary	1.00	-	0.20
Lower secondary	1.55	0.70	0.50

Source: (UNESCO 1995, Module III Section 2 Pg. 15)

In the third category, some standards still prescribe teaching space by giving their exact dimension, thus from one such regulation. “The dimension of every classroom in secondary schools should be 6m x 6m x 3.7”. The same regulation also says that every student should have a minimum of 0.74 sq. m of floor space which suggests a class of 48 students in the prescribed space.

Table 3: Standard Space and Area per Place for other physical infrastructure

S/No.	Physical Infrastructure	Standard Space
1	Needle work room	74 sq. m
2	Store	11 sq. m
3	Wood/metal workroom	11 sq. m
4	Art room	111 sq. m

Source: (UNESCO 1995, Module III Section 2 Pg. 16)

In some space, standard for special rooms or store is roughly equal to the percent of the area of the room that is thought adequate. In science a rule is that preparation rooms and store should be equal 50% of the laboratory area. In the end, of course it all depends on what is to be stored and how it is to be stored, and this is the best reason for not attempting to standardize storage areas (UNESCO, 1995).

Classroom

Classrooms constitute the most fundamental and important physical facility in every school. The construction has been seen as the most challenging requirement for all successive educational plans in Nigeria. Wikipedia describes a classroom as ‘a room dedicated primarily to teaching or learning activities.” According to the Collins dictionary ‘a classroom is a room in a school where lessons take place.” To clarify the concept of classroom within this context, it should be added that a classroom is a

physical space assigned by appropriate school authority for students to gather daily for lessons and other social interactions. This is buttressed by Piece (1994) who said that "the classroom is a critical focus for students' inter-personal and educational development." The classroom provides a safe space where learning can take place uninterrupted by other distractions. The classroom is the students' "home away from home!"

Classroom in secondary schools should provide shelter against the elements for students. Lalit (1989) and Iqbal (2005) stated that the arrangement of classroom facilities and instructional spaces should be chosen for learning rather teaching. In addition, it should facilitate teachers in providing an atmosphere which promotes the right kind of learning. According to Ijaiya (2007), Fabunmi, Brai-Abu and Adeniji (2007), the quality of physical infrastructure and learning environment has strong influence on the academic standard which is an index of quality assurance in the school. For instance, Earthman (2002), reporting on California, revealed that "smaller classes enhance teachers' effectiveness and provide opportunities for students to receive more individual attention, ask more questions, participate more fully in discussions, reduce discipline problems and perform better than students in schools with larger classrooms. Alabi (2012) adds that classroom should be spacious enough and well ventilated as poorly ventilated classrooms makes students and teachers sick.

According to Olaleye (2012), "evidence from research findings shows that the nature of classroom environment has a powerful influence on how well pupils achieve a wide range of educational outcomes." Goodlard (1984) also noted that classroom environment such as the physical, emotional and aesthetic characteristics of the classroom tend to enhance student attitude towards learning.

Table 4: Minimum standard for classroom size.

Number of students	Elementary school [square feet (meters)]	Secondary school [square feet (meters)]
10	539 (50.13)	704 (65.47)
11	564 (52.45)	768 (71.42)
12	637 (59.24)	832 (77.38)
13	686 (63.80)	896 (83.33)
14	735 (68.36)	960 (89.28)
15	784 (72.91)	1024 (95.33)
16	833 (77.47)	1088 (101.18)
17	882 (82.03)	1152 (107.14)
18	931 (86.58)	1261 (113.09)
19	980 (91.14)	1280 (119.04)
20	1029 (95.70)	1344 (124.99)

Source: **Tannar (2000)**

Libraries

The Oxford advanced learners dictionary described a library as a building or room in which collection of books, tapes, newspapers etc. are kept for people to read study or borrow. Awana (2005) defines it as a place where books and other forms of materials are kept for the purpose of reading and research. Conant in Awana (2005) gives an expanded opinion by stating that "a library is an alive expository of cultural past and a sustainer of intellectual activities that anticipates the future. The library is the agency devoted solely to the purpose of collecting, preserving, and making available, transmitting and securing the widest and most effective use of the record of civilization by the society which it is a part of." Owoeye and Yara (2011) posit that "the Library is an essential factor in teaching-learning process. It forms one of the most important educational services.

The educational process functions in a world of books. The chief purpose of a school library is to make available to the pupil, at his easy convenience, all books, periodicals and other reproduced materials which are of interest and value to him but which are not provided or assigned to him as basic or supplementary textbooks. The importance of library has been demonstrated by the government when she expressed in the National Policy on Education (NPE) that every state Ministry needs to provide funds for the establishment of libraries in all her educational institutions and to train librarians and library assistants. As a resource, it occupies a central and primary place in any school system. It supports all functions of school-teaching and provides service and guidance to its readers.

According to Fowowe (1988) a library must be up-to-date and at the same time allow access to older materials. It must be properly supported financially to fund materials and services among others. Ola (1990) opined that "secondary school library in whatever form, has replaced the traditional method of 'chalk and talk' in imparting knowledge to students and that its effect on academic performance need not to be over-emphasized." He concluded that "a well equipped library is a major facility which enhances good learning and achievement of high educational standard." It is therefore imperative to state that the provision of Physical infrastructure for use as libraries is essential to secondary education administration. The school library serves as the heart beat of any educational institution, thus it is essential that every secondary school in Kaduna metropolis should have a functional library.

A secondary school library should be equipped with books and magazines with information on different spheres of human Endeavour such as music, education,

sports, religion, business etc. According to the Lagos book club the secondary school library is expected to perform the following functions:

1. Encouraging reading habits in students, and developing the ability to learn from books without a teacher.
2. For references and to supplement whatever they have been taught in the class.

Awana (2005) adds that a school library should also carter for the needs of the community which it is situated.

Science Buildings (Laboratories)

Practical work is a unique source of teaching and learning especially in pure sciences because the students are able to observe and manipulate materials to demonstrate certain aspects of the subject matter which has been learnt in the classroom. Researchers such as Ogunniyi (1987), and Ogunu (1998) found that practical work was difficult to carry out without the provision of physical facilities for laboratories. Without the provision of these facilities teachers are forced to use the classroom for experiments and other such practical which is not convenient.

Fletcher posits that "in a laboratory students work individually or in small groups mainly independently. She points out that the distinction between laboratory and the classroom learning is that activities are student centered, with students engaged in hands-on, minds-on activities. Laboratory apparatus require special storage and arrangement which cannot be guaranteed in the classroom or any other space in the school. In addition to these Ramdev (2012), opines that "each school must have distinct sections for physics, chemistry, biology and computer labs."

2.5 Infrastructural Facilities in Secondary Schools

Infrastructural facilities are essential components of the school plant. They consist of basic amenities that play a significant role in boosting welfare of teachers and the learning conditions for students. . The administrative responsibility for creating a satisfactory school environment is not limited to providing physical facilities. The school heads should also direct the available resources to the provision and maintenance of infrastructural facilities. Existing plants will be made more functional by providing proper infrastructural facilities such as; lighting, electrical, ventilation, sanitary, water infrastructure for their efficient use (Olagboye, 2004). In addition, writing on the importance of basic amenities in secondary schools, Adeboyeje (2000) states that "efficient management of school infrastructural facilities is mandatory in order to make the school a pleasant, safe and comfortable centre that will increase students' attendance, motivation and willingness to participate adequately in both curricula and co-curricular activities."

Infrastructural facilities in secondary schools include:

- Electrical infrastructure; building wiring, fuses, generators, sockets, light fittings.
- Water supply infrastructure: boreholes, deep wells, water tanks and public water.
- Plumbing and sanitary infrastructure: water closets, sinks, taps, baths, urinals.
- Information and communication infrastructure: computers, phones, intercom, internet facilites.
- Safety and security infrastructure: fire alarm systems, fences, metal detectors,

Electrical infrastructure

Electricity is an essential requirement in any modern school plant. The advancement in Education over the decades has made it that many mechanical and electrical gadgets are needed for schools to function properly. The fact of not having electricity in a school facility has a huge impact on the general functioning of the school as well as on the teaching capacities of teachers and learning possibilities of the students. Gaither (2003) in a campaign for the provision of electricity in school in Congo declared that;

> *How do you learn? With books. Where do you find information? In the internet (sic). In Africa, it's the same as it is here. For both, you need electricity, at least if you are reading in the evening. Electricity is therefore an important prerequisite for education*.

Electricity is used for lighting classrooms, ventilating the classroom, powering new teaching media and making learning meaningful. Dewees (1999) added that lighting the school as a security measure is not an option without electrical infrastructure. The major source of electricity to schools is from the National power grid. However this is a major problem because the government has not been able to provide constant electricity to any sector of the economy. So schools have to make provisions for alternative sources of electrical power supply. These include generators, solar panels, and inverters. In addition to power supply other electrical infrastructure includes sockets, switches, wiring, fuses etc.

Water Supply Infrastructure

Water is very essential in the school system; it helps maintain health, hygiene and sanitary wellbeing of staff and students. The World Bank states that in most

developing countries, the sanitary and hygienic conditions at schools are often appalling, characterized by the absence of proper functioning water supply infrastructure. The UNICEF (1998) toolkit on hygiene, sanitation and water in school states that "schools must have access to safe and sufficient water for drinking, food preparation, hand washing, laundering, flushing of toilets, ablution, anal cleansing after use of toilet, and other cleaning and watering of school garden (or farm)." Research by UNESCO and the World Bank show that schools that lack access to basic water supply will have an increased incidence of major childhood illness (like typhoid, cholera, dysentery etc.) among students.

The National Centre for Educational Statistics (2003) in its guide of school facilities planning posits that, "water supplies are generally categorized as either "community water systems" or "non-community water systems." If a school gets its water from a local city authority, it is likely on a "community water system." If a school uses its own wells (or boreholes) as its water source, it would be classified as a "non-community system." The design of water supply facilities for a school should take the following steps into consideration:

- Assessing water supply demand at the school
- Identifying appropriate water supply technologies
- Identifying an appropriate water treatment technology
- Designing the most appropriate technical solution

Assessment of water supply demand at schools involve observing current water, use, examining condition of existing facilities (tanks, boreholes) and asking stakeholders like teachers and students on current and desired water use.

The most common water technologies used in schools are piped water (water board), shallow wells, deep boreholes, rainwater harvesting, surface water collection and water tankers. In providing water supply infrastructure school and Educational Administrators should take into consideration construction, operation, and maintenance costs, sustainability, and hygienic improvement. The expected demand for safe water will vary considerably between schools and "Ungwars" depending on cultural hygiene-related habits and the type of water, sanitation and cooking amenities. As a general indication, the consumption of water under ideal conditions can reach 60 litres per day per student in day schools that have flushing toilets and cooking facilities.

Plumbing and Sanitary Infrastructure

Plumbing and sanitary infrastructure are closely related to water supply infrastructure, but are different, although they require water infrastructure to function properly. Not all plumbing fixtures have a water connection but all must be able to remove drainage away from the building via the sanitary system. Plumbing and sanitary infrastructure comprises of pipes, water closets, drinking fountains, lavatories, washing sinks, urinals (Plumbinginfo, 2013).

Plumbing and sanitary infrastructures are important because of the role they play in maintaining hygiene and good health for students and teachers. UNESCO (2000) gives recommendations for plumbing and sanitary facilities such as latrines and urinals of approved design and in sufficient number should be provided in every school. There should be separate toilets and urinals for students and staff in mixed schools for the girls with sufficient privacy and away from latrines intended for boys. The table below shows the full UNESCO recommendations:

Table 5: Standard for Provision of Sanitary Infrastructure

Sex	Water closet	Urinals	Wash basins	Toilet cubicles	Hand washing sinks
Male	1 per 48	1 per 32	1 per 32	1 for 100 boys (where there are urinals)	1per 50 students
Female	1 per 24		1 per 48	1 for 25 girls	1 per 50 students

Source: (UNESCO, 2000, Module III Section 2 Pg. 18)

Safety and Security Infrastructure

"Securing" a facility refers to ensuring the physical security of both a facility and its occupants—and requires a comprehensive approach to planning. At a minimum, planners must consider the following issues:

Locking systems

Install locks on doors and windows as appropriate. Padlocks and chains should be provided to secure classrooms, laboratories, libraries and other places were important school properties are kept. The doors should also have good locks and prohibit manipulation of locks and entries (e.g., propping doors open). The planning guide for school plants adds that schools should secure particularly valuable equipment (e.g., computers) with heavy-duty cables and locks. Metal detectors should be installed at building entries as necessary. Edwards writing on building security describes the Installation of surveillance cameras in otherwise unobservable parts of the buildings as necessary. All these may seem outlandish but considering recent security breaches that resulted in loss of lives in schools in parts of Nigeria, it becomes imperative for them to be provided as essential part on the school plant.

Fire protection

Fires are unexpected occurrences within the school system. According to NEMA figures, losses due to school fires from 2011 till date are estimated at N2.5 billion. It is quite unfortunate that many Nigerian school administrators wish or pray it away without making provision for fire protection infrastructure. School planning guide (2005), opines that "we can maximize structural fire protection by building full-height walls and fireproof ceilings. Fire-response equipment such as automatic sprinklers, fire alarms and well-marked manual fire extinguishers should be installed as appropriate." Sand buckets can be used as supplements for schools that can't afford exclusive use of fire extinguishers.

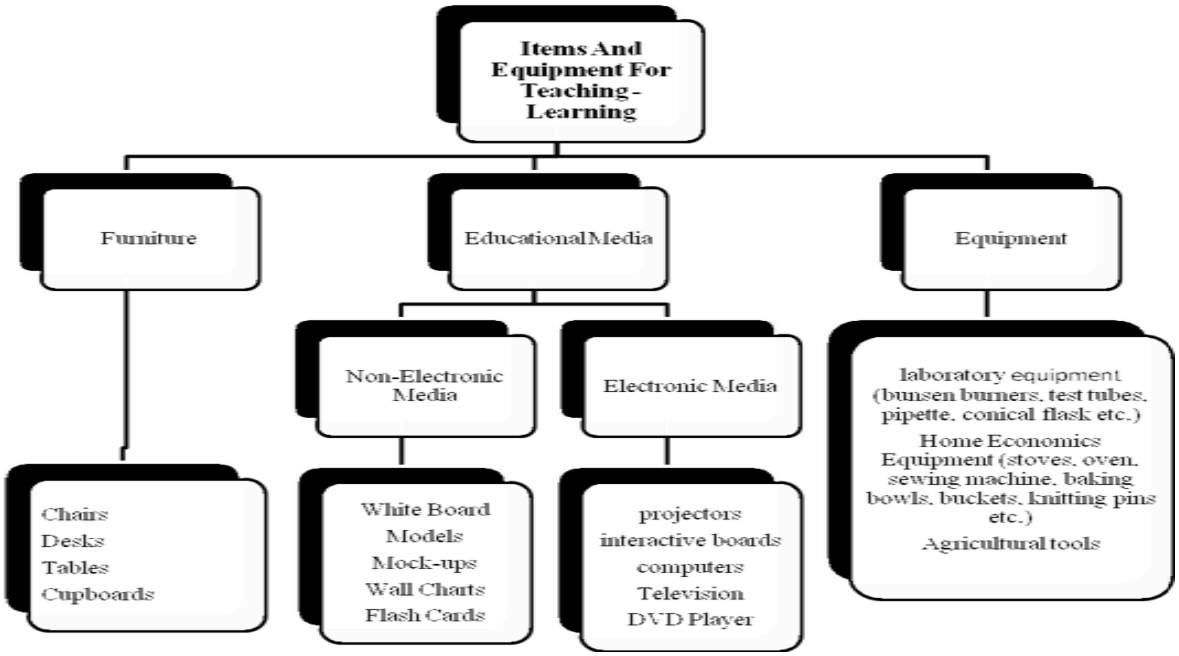
2.6 Instructional Facilities

Ojede (2004) identified teaching-learning materials, equipment and furniture as the components of instructional facilities or items for teaching and learning. Bolick, Berson, Coutts and Heinecke (2003) defined instructional facilities as things used to enhance teaching and learning. Furthermore, the teacher is assisted in overcoming physical difficulties that could have hindered effective presentation of a given topic. Instructional equipment generally makes teaching and learning less stressful. Esu (2004) describes them as "all resources within the reach of the teacher and the learner which are employed to facilitate teaching and learning. Ewurum (2009) citing Mallam and Haggai opine that rich learning items and equipment such as textbooks, adequate furniture, maps, models, specimens, laboratory equipment and audio-visual aids such as television, DVD, computers and projectors aid learners' understanding.

Educational technology constitutes a major component of teaching-learning equipment in modern societies. Owoeye and Yara (2011) in concurring with these also adds that "availability of tables, chairs, chalkboards, shelves on which instruments for practical work are arranged and educational technology are essential to facilitate students' learning outcomes." The importance to teaching and learning of the provision of adequate instructional facilities for education cannot be over-emphasized. Writing on the role of facilities in teaching, Balogun (1982) submitted that no effective science education programme can exist without equipment for teaching. This is because facilities enable the learner to develop problem-solving skills and scientific attitudes.

In their contribution, Ajayi (1999) reiterated that when items and equipment for teaching and learning are provided to meet relative needs of a school system, students will not only have access to the reference materials mentioned by the teacher, but individual students will also learn at their own paces. The net effect of this is increased overall academic performance of the entire students. Items and equipment for teaching-learning can be described by the figure below.

Figure 2: Chart for Instructional Facilities



Source: Researcher (2014)

Furniture

Furniture is an essential future of every school plant. They provide students with a means of comfortably taking part in lessons. School furniture is used to enhance an interactive, collaborative learning environment of a modern classroom. Chudi-orji (2012) in his research on improving teaching environment states that secondary school students spend a lot of time sitting and writing, hence it is important to have good seats that are easy on the body. Esu (2004) adds that "as an essential part of any classroom furniture; tables and chairs need to be practical and comfortable to maximize space and minimize fidgeting. To buttress the importance of this practicality, a recent CNN report stated; that "more than one third of children and

teens are overweight and proving too large to fit into traditional school desks." This calls for provision of adjustable tables and chairs. As new teaching pedagogies emerge and the classroom become more dynamic, furniture needs to respond, furniture should be easily reconfigured to support a variety of group sizes, enabling interaction and collaboration.

Educational Media

Educational media plays a very significant role in the teaching -learning process. Ughamadu (1998), posits that Educational media can be referred to as the wide variety of instructional materials like textbooks, chalkboard, models/mock-ups, charts, television, radio and other projected and non-projected devices or tools which bring about efficiency and effectiveness in the teaching-learning process and invariably, promote and enhance the achievement of instructional objectives. Agum (1998) in his view states that educational media refer to all forms of information carriers. Educational media involves the integration of text, graphics, video, sound to facilitate lesson delivery. Educational media can be subdivided into electronic and non-electronic media.

Electronic media refer to the category of teaching aids that make use of electricity. They also contain micro-processors to store and transmit a large volume of data and information. We now take a look at some of them.

Television: televisions are electronic devices used to view motion pictures. According to Ughamadu (1998), "the television is a medium for students to use for creative communication and experience phenomenon that cannot be easily explained in the classroom.

Computers: they are the fulcrum for the use of Information and communication technology is school. A computer is an electronic device that is made of a central processing unit, output and input devices used to create texts, graphics, audio-visual presentations. When connected to the internet or with a database soft ware the computer can provide teachers and students with an array of information on various subjects and topic. Even without internet a computer with Encarta, Oxford Learners or Encyclopaedia Britannica software on it can still give rich and diverse information.

Projectors: A projector is a device that projects images and videos from a computer or any other electronic device to a screen or other flat surface. Its images are larger than those of a television. They are also use to project notes on the board which makes teaching less cumbersome.

Interactive boards: this is the jewel of modern teaching aids. They are also referred to as smart boards. Wikipedia describes it as "a large display that connects to a computer. A projector projects the computer's desk top onto the board's surface where users control the computer using a pen, finger or stylus." The board is usually mounted on the wall or mounted on a stand. The Becta harnessing technology by schools survey (2007) indicated that 98% of secondary schools in the United Kingdom use Interactive boards. The white board helps create a virtual environment in the classroom and brings abstract concepts to life.

Electronic media are fast becoming more popular and widely used at all levels of education in the world. In Japan, electronic devices are widely diffused among and effectively used by elementary and secondary schools such that 75% of lower secondary and 53% of upper secondary schools are in possession of them. (Ministry of Education, Culture, sports, science and technology Japan, 1988, p.14)

Non Electronic Media

These are equipment used in teaching-learning that require no form of electricity or electron processing. We now take a look at some of them.

i) **White boards**: blackboards later known as chalk boards used to dominate classrooms back in the days. These days, however, more and more white boards are penetrating the school scene. A white board is a panel with shiny, smooth surface that is usually white. Myers (2012) states that a whiteboard, dry-wipe board, dry-erase board, marker board is usually a white and glossy panel and is used as surface for non-permanent markings. The white board as a preferred apparatus for classroom instruction came as a result of the health hazards caused by chalk. An online health journal reports that chalk is made up of gypsum, it gives of a powder that was a huge irritant to the respiratory tract. In addition to this many teachers have complained of the messy and grubby state that chalk boards leave them after each class.

ii) **Models and mock-ups**: According to Ughamadu (1998), models and mock-ups are three dimensional objects (that is, objects with depth or thickness, height and width). They are modified real things or representatives of real things. Models are usually scaled (enlarged or reduced) representations of actual phenomenon while mock ups are models of an object built or created to follow a specific design. They usually have larger sizes and movable parts. Examples are skeletons with movable parts, buildings, automobiles, etc.

iii) **Wall charts**: charts include maps, diagrams, posters, pictures which show abstractions of reality. Adesina (2004) noted that after the board, wall charts are probably the most useful type of teaching aids available to the teacher. Charts used to be made from cardboards before but these days are made from glossy

paper or plastic sheets. The main purpose of chart production is to present visual ideas or concepts which are likely to be difficult to understand if presented orally or in written form.

Equipment

There are various equipment that constitutes items for teaching-learning. Laboratory, home economics apparatus, agricultural tools etc are an important part of secondary education. These equipment are essential for courses that require practical work such as sciences, home economics, agriculture, fine arts, music etc. In any learning experience involving students in activities such as observing, counting, measuring, experimenting, recording, observation and cooking adequate equipment is required in addition to physical infrastructure to ensure qualitative teaching-learning. Essential equipment for teaching learning is tabulated below:

Table 6: Teaching- learning equipment

S/N	Science Equipment (Physics, Chemistry, Biology And Integrated Science)	Agricultural Equipment	Home Economics Apparatus	Fine Art Apparatus	Music Equipment
1	Test tubes	Hoe	Stove/ Gas cooker	Pastel	Recorder/Flute
2	Thermometer	Hand Trowel	Oven	Scissors	Keyboard
3	Beaker	Cutlass	Rolling pin	Paint Brushes	Drums
4	Bunsen Burner	Slides	Baking pan	Buckets	Local stringed instruments
5	Burette	Watering can	Mixing bowls		
6	Evaporating dish	Garden rake	Kitchen crockery		
7	Mortar and Pestle		Knitting/sewing apparatus		
8	Specimen holder				
9.	Glass prisms				

Source: Researcher, (2014)

2.7 Welfare Facilities in secondary schools

According to the United States Department of Education (USDE, 1998), "if you employ anyone (however short the period) you must 'so far as is reasonably practicable', provide adequate and appropriate welfare facilities for them while they are at work. This means you must provide such facilities unless it is clearly unreasonable in terms of time, trouble, cost and physical difficulty. Srinivas (2013) posits that, employee welfare facilities in the organization affects on the behavior of the employees as well as on the productivity of the organization. While getting work done through employees the management must provide required good facilities to all employees. The management should provide required good facilities to all employees in such way that employees become satisfied and they work harder and more efficiently and more effectively."

This assertion is particularly requisite for the secondary school system in Nigeria. The HSE further asserts that 'Welfare facilities' are those that are necessary for the well-being of your employees, such as washing, toilet, rest and changing facilities, and somewhere clean to eat and drink during breaks. Ankita (2013), writing on teachers' welfare in India adds that welfare facilities should include:

1. Staff rooms and lounges
2. Residential quarters
3. Health/medical facilities
4. Transport facilities

The provision of welfare facilities is geared at making work easier for staff, creating a conducive environment and attending to the general physiological and psychological needs of teachers and others within the school community.

Staff Rooms

Staff rooms are places were teachers stay when they are not in Class. Undie (2007) posits that, "the staff room, which is also known as the teachers' lounge in American lexicon, "is a room where teachers have their desks and prepare their lessons, it is different from a common room which is more of a place for social interactions. Michele Hanson in an article in the Guardian (2012), describes the staff room as "a small oasis of calm and sanctuary, away from the demands of students …, somewhere to sit down, have a breather, do your marking, meet your chums... a place where new teachers can ask old hands for advice and support and all teachers can meet. Ojede (2004) adds that, "it is also a space where lesson plans are perfected; preparations are made for meetings and small group learning activities takes place.

However, Chan (1999) writing on staff room comfortability posits that "the staff room should be a place where teachers can relax and decompress; it should feel distinct from the rest of the school, more grown up and more polished". From the forgoing it is evident that the staff room as essential for teachers' welfare. The Planning and Building Unit Department of Education and Science, Olga (2011), provides the following guidelines for staff rooms:

- Natural day lighting should be exploited when designing rooms, to minimize the dependence on artificial lighting. Windows for teaching spaces should have a horizontal vista.
- Glare must be avoided. Roller blinds used on elevations receiving direct sunlight to reduce glare should be translucent to minimize light reduction. If required, these should be supplied and fitted as part of the construction contract.

- Ventilation where possible should be natural; ventilation by means of permanent wall vents and windows with opening sections. Vents should contain baffles for noise, wind and rain. Windows generally should be double glazed, easy to clean and maintain, and have high and low level opening sashes.
- The position and size of opening window sashes must take into account ease of operation, natural ventilation requirements, and Health and Safety. Stays or restrictors should be used on all opening/ windows both high and low level.
- Doors should be easy to open and close. Care should be taken in the design of the door, frame, and opening mechanism to minimize the risk of injury to fingers, etc.

The UCSC school planning guide (2004) adds that:

- The staff room should have social and work areas. The separation of the areas can be achieved by appropriate arrangement of furniture.
- An area for computers should be integrated with the normal work area.
- Lockers should not be intrusive.
- Members of the public should not be able to gain direct access to this room without first reporting to the reception.

Toilets for staff

UNESCO policy is that staff and pupils should never have to share facilities. Toilet and washing facilities for staff must be separate from those for pupils. The document also postulates that, Toilets must be provided for staff which is readily accessible, adequately lit and ventilated and kept in a clean condition. Separate facilities must be provided for men and women unless each toilet is in its own room with a door capable of being secured from inside

Toilet facilities and washrooms for staff must be separate from those provided for pupils, except in the case of facilities provided for disabled people. Toilet and washing facilities for staff may also be used by visitors. Washing facilities must be provided in the vicinity of every toilet, be supplied with hot and cold running water, must contain soap and towels or other means of drying hands, must be sufficiently ventilated and lit and must be kept clean. The HSE guide (2003) adds that:

You have to provide adequate toilet and washing facilities for your employees. 'Adequate' means you have to provide:

- enough toilets and washbasins for those expected to use them people should not have to queue for long periods to go to the toilet;
- clean facilities, to help achieve this walls and floors should preferably be tiled (or covered in suitable waterproof material) to make them easier to clean;
- a supply of toilet paper and, for female employees, a means of disposing of sanitary dressings;
- facilities that are well lit and ventilated;
- facilities with hot and cold running water;
- enough soap or other washing agents;
- a basin large enough to wash hands and forearms if necessary;
- a means for drying hands, e.g. paper towels or a hot air dryer;
- showers where necessary, e.g. for particularly dirty work.

The tables below shows the minimum number of toilets and washbasins which should be provided for staff.

Table 7: Washbasins For Staff

Number of People	Number of WCs	Number of Washbasins
1-5	1	1
6-25	2	2
26-50	3	3
51-75	4	4
76-100	5	5

Source: (UNESCO, 2000, Module III Section 2 Pg. 18)

Health Facilities in Secondary Schools

School-based health services (SBHS) have the potential to impact on the health of secondary schools students by providing accessible, comprehensive and intensive health services. Iqbal (2005) suggested that students in schools with health centers had greater access to health care compared with a national sample of students without access to SBHS, but found few differences in health risk behaviours, mental health, or pregnancy rates. Another study of African American adolescents from 7 Midwestern US high schools found that students in schools with SBHS were less likely to smoke cigarettes and marijuana than students in schools without SBHS (Denny et al, 2014). The World Health Organization (WHO) defined a health promoting school as one that is constantly strengthening its capacity as a healthy setting for living, learning and working. Such schools foster healthy and learning environment.

Ezekweseli In Asiyai (2012) asserts that, 'Provision of health services like immunization, school feeding, counseling, sick-bay and school dispensaries are not new to Nigeria." These support services contributed to the high quality of education

Nigeria was once known for. WHO (2000), adds that, "the promotion of the health of learners in schools is a critical step towards quality achievement in education. School Health services as an essential component of effective school health program ensures that children are healthy and able to learn at all times. It is an essential component for achieving "Education for All" (EFA) inclusive of children with special needs." Denny et al (2014) after conducting a survey of secondary schools in New Zealand discovered "that Analysis of survey data on the health and wellbeing of students at schools with and without school health services gives some evidence of the effectiveness of those services, although such survey results do not allow any unequivocal finding in this regard.

The most notable results were in the mental health domain: there was less depression and suicide risk among the students in schools that had higher levels of health services. Looking more closely at the specific qualities of the school health services that were particularly associated with improved mental health outcomes among the students and teachers, there was significantly less depression and suicide risk where the school health services had health professionals on site. School Health Services are preventive and curative services provided for the learners and staff within the school setting. The purpose of the School Health Services is to help children at school to achieve the maximum health possible for them to obtain full benefit from their education. Health facilities must be provided in order to cater for the medical and therapy needs of staff and pupils. The Federal ministry of Education (2013), in its guidelines for school health scheme asserts that:

- 'The school health service centre should be sited in the school premises to serve the school or not more than 10 primary and secondary schools clustered within 15 minutes walk. The service centre must be easily accessible and

designed to eliminate or diminish barriers to care for students and to participation by parents or guardians.

- The centre must operate everyday during school/boarding hours. Hours of duty must be: Convenient to learners and staff and include some hours before and after school for day schools, Allow parents and guardians who wish to participate in the care of their child, to the maximum extent possible permit scheduled appointments that do not unnecessarily interrupt the student's classroom time.
- The centre must provide services to students in a manner which ensure the students and his/her family's right to privacy.
- the medical examination and treatment of staff and students; and
- The short term care of sick and injured staff or students, which includes a washing facility and is near to a toilet facility.

The minimum requirement for setting up a school health centre:

i. A space as wide as classroom for 30 - 50 students to be partitioned into
    - A waiting room
    - Private examination room
    - A treatment/observation room with a minimum of 2 beds
    - Bathroom and toilet facility

ii. Provision of safe water – e.g. solar powered borehole or well

iii. Provision of a functional refrigerator – powered by kerosene, solar or electricity as appropriate.

iv. Constant and regular supply of drugs and consumables according to the prevailing diseases in the community. Drugs should be provided according to the essential drug list.

v. Provision of regular power supply – either electricity or solar

vi. Provision of means of sterilization of equipments and instruments

vii. Provision of safe disposal of medical waste.

viii. Constant and regular supply of stationeries for proper record keeping

ix. Provision of adequate health record keeping system like record card, computer system etc.

x. Provision of transportation to referral centers/visits to school clinic if located elsewhere

(UCSC 2004) adds that, "Where a school caters for pupils with complex needs, additional medical accommodation must be provided which caters for those needs. For the purposes of this regulation, a pupil has 'complex needs' if the pupil has profound and multiple learning difficulties in addition to other significant difficulties, such as a physical disability or sensory impairment, which require provision which is additional to, or different from, that generally required by children of the same age in schools other than special schools or by children with special requirements."

Other welfare facilities

Suitable and sufficient furniture must be provided both for teachers clothing not worn during working hours (e.g., coats) and for special clothing worn at work but not taken home (e.g., protective clothing, overalls, lab coats, sports wears etc.). Such furniture should enable work and personal clothing to hang in a clean, warm, dry, well ventilated place where it can dry out during the course of the working day if necessary. The accommodation should consist of, as a minimum, a separate hook or peg for each worker.

Provision of car parking should be as per schedule of accommodation.

- At least two designated car-parking space to be provided for disabled users (i.e. holders of disabled permit) from the allocated number and the total number of such spaces should be in accordance with the Building Regulations and the National Disability Authority guidelines.
- Car parking should be designed to utilize as far as possible existing site access roads or in a new school the access road to the main entrance.
- Spaces should be designed in a cost-effective manner.
- Car parking should be located adjacent to the staff and visitor entrances to the school. If a separate staff entrance is provided, the location of this access should be convenient to the car park.
- Separate car parks for staff and visitors are not recommended.

Facilities for Rest and to Eat Meals

The Minessota guide for teachers welfare recommends that:

- Teachers must be provided with suitable and sufficient rest facilities at readily accessible places.
- Suitable rest facilities must be provided for pregnant women and nursing mothers at work.
- Suitable and sufficient facilities must be provided for teachers at work to eat meals where necessary.
- Eating facilities should include a facility for obtaining a hot drink eg a kettle, vending machine or a canteen. Eating facilities should be kept clean and hygienic. In the Nigerian context it a refridgirating unit should be added.
- Facilities for pregnant women and nursing mothers to rest should be

conveniently situated in relation to sanitary facilities and, where necessary, include the facility to lie down.

2.8 Sports/Recreational Facilities in Secondary Schools

Sports and recreation are an essential component of secondary education. It is essential for helping students maintain proper physical and mental well being. As the popular saying goes "all work and no play makes jack a dull boy". Sports' is also a career path some students can decide to follow after secondary education. Sports activities play an important and crucial role in the development of balance personality of the child. Sporting activities have been known to be an integral component of the educational programmes of the most, if not all nations of the world. In Plato's Republic, physical education was included as an integral component of the educational system. It is therefore the function of the school to socialize the individuals. Recreational activities are important for both teachers and students. Fenker (2004) posits that "quality sports and recreational programs are needed to increase physical competence, health-related fitness, self-responsibility and enjoyment or relaxation". Undie (2007) also added that recreational activities act as an outlet for releasing tension, and anxiety and facilitates emotional stability and resilience.

In furtherance of this Lawason and Gede (2011), posit that, "sports and recreational activities can be a force in helping students and staff socialize with each other and provides opportunities to learn positive people skills. That is why it is imperative to provide students with facilities for this purpose. Iqbal (2005) stated that the games are designed and planned for both instruction and enjoyment. Children, youth and adults who play, may develop skills that would be beneficial for personal

and societal advancement. Many great athletes who have won laurels at International events for Nigeria horned their skills in secondary schools' sports facilities. Most of the games can be played in the gymnasium or on the school grounds by the available equipments and facilities. Indoor games for recreation are monopoly, scrabble, billiard, chess, table tennis, draught, badminton, luddo. These games can be played in a big common room and each game has a need of various equipments.

To buttress this point Joseph Etso in an interview with the Guardian (2012) urged all school owners and would be school owners to consider provision of sports facilities as top priority in their structural plans. He said, "I believe that if children are exposed to good facilities, they will do better both on the field and in the classroom." He further described secondary schools as laboratories where sports talents are discovered, nurtured and groomed to represent the country.

The Federal Ministry of Education (2013) recommends:

> Every school shall have playground and a large room for indoor activities such as:

i. Ludo, Draft, Scrabble and Chess for recreational purposes.
ii. Playground in the school shall be clean and safe to avoid accidents, injuries and bites from reptiles.
iii. The facilities must be adequate and properly located within the school i.e adequate space of not less than 2.5m away from fences, buildings, walls, walkways, tree branches and other obstruction.

iv. The facility shall have a fall zone of about 2.00m in all directions from the perimeter of the equipment/facility installed within. The fall zone shall be a distance twice the height of the pivot point where applicable.

v. The facility must be accessible to learners and other members of the school community.

vi. The recreational facilities and equipment shall be properly maintained.

vii. All equipment shall be properly stored and not left indiscriminately for the protection of learners.

Crompton (2005) opines that, the provision of adequate facilities, supplies and equipment are as important as providing adequate incentive for the students and staff, but the maintenance of such adequate facilities, are also essential. According to Adesina (2004), Denny et al (2014), traditionally, at the secondary schools level, facilities, supplies and equipment management are usually the responsibilities of those persons who are in-charge of physical education and sports programme. Bucher and Krotee (2002) opined that facilities for which they are responsible include outdoor facilities – such as playgrounds, pools, skate parks, courts and fields – and indoor facilities – such as locker and shower rooms, natatorium, racket, sport courts, weight and exercise rooms, arenas, climbing walls, and gymnasiums, their supplies and equipment. Olaboye (2004) asserted that, "Recreational facilities, supplies and equipment management includes not only the effective scheduling, operation, and maintenance of such facilities, supplies and equipment but also, at times, planning new structures to keep pace with the demand for participation in physical education, recreation and sports programmes of the school."

2.9 Empirical Studies

This section reviewed some empirical studies relevant to this study, with the aim of identifying trends in research work on various aspects of school plant provision and maintenance. It is also used as a base for comparing findings of the current study and previous works. Some of the studies were on physical facilities and equipment while others were on various aspects of how to improve the management of educational facilities.

Ejikeme (1999) undertook a study on management of Physical Facilities and Equipment in Onitsha Education Zone, 1520 teachers and 23 principals constituted the population of the study. The findings of her study revealed that both principals and teachers agreed that the PTA construct classrooms blocks, the State Education Commission provides important school records, the community provides land for erection of structures. The study revealed that parents provide desks and chairs for their children. However, Ejikeme (1999) commented pathetically, that despite these contributions, her studies revealed that there were no stores officers in charge of these facilities. The deplorable conditions of the plants in the schools in Onitsha Education zone was thus an epitome of total neglect. The best-planned plant that is not maintained soon becomes defaced and losses its aesthetics value and worth. Owodogu (1989) wrote that "a poorly kept building … or poorly maintained site, all inhibit the development of a good educational programme". This is similar to the first and second objective of this study, which is about finding out the provision and maintenance of physical facilities. The difference is that Ejikeme covered Onitsha while this research covers Kaduna.

In their bid to find out the extent of plant maintenance in our schools, Ogonor and Sani (2001) carried out a study on maintenance of secondary school facilities in Midwestern Nigeria. The survey study, which used (250) principals of secondary schools in the then Midwestern Nigeria (Edo-Delta States) as respondents, had four research questions and four hypotheses. The study revealed that the facilities, which are provided in schools, were grossly inadequate vis-à-vis the number of users of the facilities. The classrooms are without ceilings, and chairs and desks were grossly inadequate for students. The study also revealed that the conveniences available were not only inadequate but also unkempt. It was also discovered that there appeared to be a culture of non-replacement of worn out facilities as school personnel have not been responsive to the repairs of facilities. This is similar to the present research in the sense that it covers maintenance of schools facilities but it does not go into specific facilities like sports/recreation and welfare facilities.

Sa'ad (2013) evaluated the provision and maintenance of infrastructural facilities in boarding secondary schools in Yola metropolis. The study was carried out to find out whether there is appropriate provision of infrastructural facilities that would solve the problems of students' overpopulation in classrooms, provision of laboratories and workshop facilities, the accommodation of students and teachers, games facilities for students' sporting activities and water and electricity supply in boarding schools. The study used a survey design, six hypotheses were formulated and the testing was done by using analysis of variance (ANOVA). The results showed that generally, there is lack of maintenance of infrastructural facilities in schools. Based on the findings it was recommended that the Adamawa state government should make adequate provision of boarding facilities in secondary

schools in Yola. It also recommended the ministry of Education should monitor and supervise schools on regular basis. The current research also examines the provision and maintenance of infrastructural facilities but differs by also investigating instructional, welfare and sports facilities. It also covers all secondary schools not just boarding schools.

Tamunobelema and Nwachukwu (2012) examined the management of Physical Education facilities, equipment and supplies in secondary schools in Nigeria. They surveyed 1500 secondary schools across the 6 geopolitical zones in Nigeria. The study used a survey design and 8 hypotheses were formulated and tested using ANOVA. The place of physical education facilities, equipment and supplies in secondary schools sports development were discussed. This research exposed the problems of physical education facilities, equipment and supplies in secondary schools in Nigeria. It also discussed the poor maintenance culture of physical education facilities, equipment and supplies, and the state of facilities, equipment and supplies in Nigerian public secondary schools. Based on the discussions some of the recommendations made were that: All heads of schools should be held responsible for lack of maintenance culture of physical education/sports facilities, equipment and supplies. It was also advised that all hands and efforts should be on deck as to provide standard and adequate facilities, equipment and supplies that were locally manufactured for easy maintenance and cost. The study relates to the present study because physical education facilities falls under physical facilities being examined by it. The present study goes beyond just Physical education facilities but examines the school plant generically.

Denny(2014) carried a survey of School based health facilities in New Zealand, they surveyed of 8500 students in a random sample of 125 secondary schools, and they surveyed the health services in the same schools. The results reveal considerable variability in the provision of health services in schools. A significant proportion (12%) of secondary schools reported no health services beyond the minimum requirement of first aid provision; this was more common among private schools than integrated or state-funded schools. The other 88% of schools report some level of health service. The most common model of health service provision, in 56% of schools, was by visiting health professionals. Other schools had on-site health professionals: 20% had a health professional (a school nurse) and 12% had a collaborative health team of health and other professionals on site for most of the week.

The survey further revealed that Schools with higher levels of health service (an on-site school nurse or health team) were more likely to have more facilities, to be better integrated with the school, the community and local Primary Health Organizations, and to provide routine comprehensive health assessments and more comprehensive health services. The interesting fact of this survey is that discovery that government schools had better health facilities than private schools in New Zealand. The reverse is the case in Nigeria. All the above studies examined the provision and maintenance just a part of the school plant. The present study under takes a more holistic approach to examining school plants in secondary schools.

2.10 Summary of Literature Review

This chapter has examined an array of literature relating to the provision and maintenance of school plants in secondary schools in Kaduna State. The concepts of

perception, provision, and maintenance and school plant school were examined. The review gave the research insight into the diverse dynamics of the provision and maintenance of school plants. It examines the opinions of several scholars like Olga (2011), Asiabaka (2012), Lawanson and Gede (2011), Weihrich and Koontz (1999), Griffin (2003) among others on the various types of physical facilities, infrastructural facilities instructional facilities, welfare and sporting/recreational facilities. Physical facilities are made of buildings for classrooms, laboratories, libraries, gymnasiums and other physical infrastructure. Scholars like Olutola (1982), Onasanya and Adegbija (2007), and Adesina (2009) all have written on the necessity and importance of physical facilities in secondary schools. According to the research efforts of Ijaiya (2007), Fabunmi, Brai-Abu and Adeniji (2007), the quality of physical infrastructure and learning environment has strong influence on the academic standard which is an index of quality assurance in the school.

Infrastructural facilities which comprise water infrastructure, sanitary facilities, electrical facilities, security and safety infrastructure are examined and their relevance to the school system is also noted. Olagboye, (2004) stated that, "Existing plants will be made more functional by providing proper infrastructural facilities such as; lighting, electrical, ventilation, sanitary, water infrastructure for their efficient use."

Instructional facilities for teaching otherwise known as teaching aids are another part of the school plant that should be provided for an effective school system. They include items such as furniture, maps, charts, whiteboards, projectors etc. Welfare facilities such as staff rooms, health facilities, toilets for staff are show to play an important role in the secondary school system.

School plant planning is an important step in the provision and maintenance of school plants. It involves projection for future action. In terms of school plant management, it includes survey of educational needs of framing of policy, implementation of policy and evaluation of plan. Planning is essential because it shows the administrator the path to achieving educational objectives in the provision of school plants. Maintenance is a set of activities geared towards keeping the school plant as close to its original state as possible. Building and facility servicing and repairs are part of the maintenance operations carried out by school administrators. In large schools it is sometimes required to employ specialists to carry out maintenance operations. For maintenance to be carried out successfully, students and staff have to be actively involved. The principles of school plant maintenance as postulated by Xaba (2012) are listed to complement other scholarly works on school plant maintenance.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

After the review of literature relevant to this study in the last chapter, the focus of this chapter is to present the methods that were employed in conducting the research. The headings to be discussed in this chapter include the research design, population, sample and sampling techniques, instrumentation, validity of the instrument, reliability of the instrument, pilot study, and administration of the instrument and methods of data analysis.

3.2. Research Design

Research design is concerned with laying a strong structure and also ensuring that the researcher will not bring into his/her effort a lot of inadequacy (Akanbi, 2002). It can also be said to be the blue print of the research work. The research design in the opinion of Asika (2006) is used in research proposals to demonstrate how the proposed research will be observed, controlled or manipulated to generate necessary primary data for the study. In light of the above, the descriptive survey design was employed by the researcher to generate data for the study. This design is appropriate because in the opinion of Anyanwu (2003) and Ukeje (1992) descriptive research posses' great relevance for adoption when a researcher intends to describe conditions that already exist. It is usually employed by collecting data on and describing in systematic manner the characteristic features or facts about a given population from a few people or items considered to be representative of the entire group (Ajayi & Yusuf, 2012). Data were collected from representative samples;

therefore, the design is suitable for it. The researcher drew mainly primary data for the study but secondary data from the Ministry of Education was consulted.

3.3. Population of the Study

The primary population for this study consists of all the secondary schools in Kaduna metropolis. The secondary population is 1427 teachers, 37 principals in and 20 Staff of the Kaduna North zonal office of the Ministry of education.

3.4. Sample and Sampling Technique

In a survey research, it is appropriate to study a representative sample of the population from which a generalization can be made. Simple random sampling was adopted for the purpose of the study. Ten (10) schools were randomly selected, this represents 27 percent of the population According to Undie (2007), 25 to 30 percent of the population is considered adequate representative sample in education and social science research. The random sampling was used to give equal opportunities to all secondary schools in Kaduna of being selected.

Table 8: Summary of distribution of the population and sample of respondents in the study.

S/NO	Respondents	Population	Sample
1	Principals	37	10
2	Teachers	1427	200
3	Ministry of Education	20	20
	Total	**1484**	**230**

Quota and purposive sampling technique was used to select 20 teachers from each of the selected schools 10 principals the principals and the entire twenty officials of the Kaduna north zonal office of the Ministry of Education. According to Asika

(2005) purposive sampling is a non-probability sampling technique which a researcher can employ to select a sample that appears to him/her as being representative of the population defined by the research problem. Bells (2012), Ross and Green (2014) all posit that the purposive and quota sampling technique may not produce a sample that is representative of a larger population, but can be exactly what is needed in some cases- study of organization, community or some other clearly defined and relatively limited group. The population of this study meets these criteria.

Table 9: Table of Sampled Schools.

S/no	Names of schools	Principals	Teachers
1	GGSS Kawo	1	20
2	SMC	1	20
3	Rimi College	1	20
4	GJSS Ungwa Rimi	1	20
5	GGSS Indp Way Snr	1	20
6	GSS Kargi Road	1	20
7	GGSS U/Sariki	1	20
8	G.C.K	1	20
9	GJSS K/Marshi	1	20
10	GSS Doka Snr	1	20
	Total	10	200

3.4 Instrumentation

There are a variety of instruments which a researcher can adopt to collect data. These include questionnaire, interview, observations, rating scale, checklist and anecdotal records. Descriptive studies are aimed at finding out "what is," so observational and survey methods are frequently used to collect descriptive data (Borg & Gall, 1989). This study employed the “Questionnaire for the Perception of Stakeholders on the Provision and Maintenance of School Plants in Secondary

Schools in Kaduna Metropolis (QPSPMSP)" to gather primary data on the opinion of stakeholders on various aspects of school plant provision and maintenance. It was designed by the researcher for the purpose of this study. The questionnaire has two parts: Part one is on demographic data of the schools and respondents. Part two has 80 items designed to explore the perceptions of stakeholders on the provision and maintenance of school plants in Kaduna metropolis. The five point rating scale with a response mode of Strongly Agree, Agree, undecided, Disagree, Strongly Disagree was used for this section of the instrument. The scale was rated as follows:

Strongly Agree (SA) 5 points

Agree (A) 4 points

Undecided (U) 3points

Disagree (D) 2 points

Strongly Disagree (SD) 1 point

The respondents were requested to indicate by ticking (√) in the appropriate boxes, the responses applicable to the items.

3.5 Validity of the Instrument

The content validity of the instruments was asserted by The Head of Department and two other senior lecturers in the department of Educational administration and planning during a questionnaire vetting conference. They assessed the instrument in terms of content coverage, the language used, arrangement of questions and how they relate to the research objectives. They made useful input such as reframing some of the items, deleting irrelevant ones and simplifying some ambiguous ones. Their comments and observations formed the basis of necessary

modification of the instrument. The draft was corrected was approved by the researcher's supervisor before the final production was made.

3.6 Pilot study

To determine the reliability of the instrument, a pilot study was conducted in two schools (Ahmed Markarfi memorial school and GGSS (senior) Independence way, Kaduna) outside the sample for the study, using 18 teachers and 2 principals. The study revealed some lapses in the instrument, as provision was not made for data from stakeholders in the ministry of Education; the lapses were duly corrected by the researcher.

3.7 Reliability of the Instrument

The time interval reliability of the instrument was established through a test re-test administration of the instrument. In doing this, the questionnaire was administered to principals and teachers totaling 20 in number from two schools outside of the selected sample. After two weeks, the instrument was re-administered to the principals. The scores were obtained. The data collected from the test re-test were subjected to reliability analysis by the technique of Pearson Product Moment Coefficient of Correlation. A value of 0.83 was obtained. The split half method of reliability was also employed in determining the internal consistency of the items in the Likert structure of the questionnaire designed on assessing the perception of stakeholders on the provision and maintenance of school plants. In doing this, the items in the questionnaire were split into two using even and odd numbers. The Scores were obtained and Cronbach's alpha was employed in analyzing the data collected. It gave a co-efficient alpha of 0.8276. The researcher accepted these values as an indication that the items were internally consistent and the instrument therein

reliable. This consideration was based on the fact that Ofojebe 2002 said that a co-efficient greater than 0.5 is considered high and acceptable.

3.8 Administration of the instrument

The researcher employed and trained two research assistants to help in the administration of the questionnaires to respondents in schools. Each covered five (5) schools each, while the researcher administered the instruments to respondents in the Kaduna north zonal office of the ministry of Education. Two hundred and thirty copies (230) of the instrument were administered. All were duly completed and returned.

3.9 Method of Data Presentation and analysis

Information gathered through the questionnaire was analyzed using the Statistical Package for Social Sciences (SPSS), which was used to generate the frequency and percentages of scores while the five (5) hypotheses were analyzed to identify the mean difference using Analysis of variance (ANOVA).

CHAPTER FOUR

PRESENTATION, ANALYSIS AND DISCUSSION OF DATA

4.0 Introduction

This chapter presents the data collected, the analysis carried out and the discussion of the result obtained. The analysis is presented in sections. The first section presents the frequency and percentage distribution of bio data respondents and nominal questions as responded by respondents. The second section presents the answers to the research questions using descriptive parameters of mean scores, standard deviation and standard errors. The third section presents the testing and interpretation of ten null hypotheses using parametric statistical technique of Analysis of Variance statistics. All hypotheses were tested at 0.05 alpha level of significance. The major findings are then revealed before the discussion of the major findings.

4.1 Bio-data of Respondents

Table 10: Distribution of respondents by gender

Gender	Frequency	Percent
N/R	2	11%
Male	101	44%
Female	127	55%
Total	**230**	**100%**

A total of 127 of the teacher respondents representing 55.2% are females while the rest 101 (43.9%) are males. Two people representing 0.9% did not respond to the question.

Table 11: Distribution of respondents by Age

Age	Frequency	Percent
N/R	4	1.7
20-25 yrs	43	18.7
25-30	81	35.2
35-40	63	27.4
40 yrs and above	39	17.0

The years of age of the respondents showed that 43 (18.7%) are between 20-25 years while those from 25-30 years are 81 (35.2%). Those from 35-40 constitute 27.4% of the population with 63 people. 40 years and above make up 17% (39), 4 people (1.7%) made no response.

Table 12: Distribution of respondents by educational qualification

Educational qualification	Frequency	Percent
N/R	10	4.3
N.C.E	64	27.8
BED	74	32.2
BA/B.Sc/B.tech	41	17.8
PDGE	23	10.0
M.Ed	11	4.8
MBA/M.Sc	3	1.3
PHD	4	1.7
Total	**230**	**100.0**

According to the table above, 64 people representing 27.8% of the respondents have NCE. 74 (32.2) and 41(17.8%) people have BED or BA/B.sc/B.tech

respectively. Others have PDGE (10%), M.Ed (4.8%), MBA/M.Sc (1.3%) and PHD (1.7%).

Table 13: Distribution of respondents by years of experience

years of experience	Frequency	Percent
N/R	5	2.2
1-5 YRS	59	25.7
6-10 YRS	44	19.1
11-15 YRS	45	19.6
16-20 YRS	42	18.3
20 YRS AND ABOVE	35	15.2
Total	**230**	**100.0**

On the respondents years of experience, 59 (25.7%) each have spent between 1-5 years, 44 (19.1%) have spent between 6-10 years, 45 (19.6%) have 11-15 years of working experience, 42 (18.3%) have worked for 16-20 years while 35 (15.25) have worked for more than 20 years. 5 respondents representing 2.2% did not respond.

Table 14: Distribution of Respondents by Status

Status	Frequency	Percent
TEACHERS	200	87.0
PRINCIPALs	10	4.3
M.O.E	20	8.7
Total	**230**	**100.0**

On the status of the respondents, 200 (87.0%) are teachers, 10 (4.3%) are principals while 20 (8.7%) are staff of the ministry of education.

Research Question One

RQ1: ***What is the perception of stakeholders on provision of physical facilities in secondary schools in Kaduna Metropolis?***

This research question was answered and presented in Table 15.

Table 15: Opinions of Respondents Based on provision of physical infrastructure in secondary schools in Kaduna metropolis

S/N	Item Statement	Response Categories				
		A	**U**	**D**	$\overline{X}$	**SD**
1	Classrooms are provided in secondary schools in Kaduna metropolis.	205	6	17	3.8	1.4
2	Laboratories are provided in secondary schools in Kaduna metropolis.	131	20	51	3.6	1.2
3	Art rooms are provided in secondary schools in Kaduna metropolis.	88	38	100	.98	1.22
4	Libraries are provided in secondary schools in Kaduna metropolis	175	8	47	3.85	1.03
5	Physical and health education facilities are provided in secondary schools in Kaduna metropolis.	93	27	110	3.07	1.33
6	Computer rooms are provided in secondary schools in Kaduna metropolis.	163	7	50	3.68	0.94
7	Technical workshops are provided in secondary schools in Kaduna metropolis.	111	87	82	2.93	1.09
8	Agricultural farms are maintained in secondary schools in Kaduna metropolis.	48	7	135	2.56	1.16

The above table reveals the opinion of stakeholders on the provision of physical infrastructure in secondary schools in Kaduna Metropolis. Their highest mean ranking response of 3.85 implies that Physical infrastructure are provided, as details to this response showed that majority of the respondents agree with this item.

Research Question Two

RQ 2: ***What is the perception of stakeholders on maintenance of physical facilities in secondary schools in Kaduna Metropolis?***

This research question was answered and presented in Table 16.

Table 16: Opinions of Respondents on maintenance of physical infrastructure in secondary schools in Kaduna metropolis

S/N	Item Statement	Response Categories				
		A	**U**	**D**	$\overline{X}$	**SD**
1	Classrooms are maintained in secondary schools in Kaduna metropolis.	131	19	80	3.1	1.3
2	Laboratories are maintained in secondary schools in Kaduna metropolis.	159	20	51	3.6	1.1
3	Art rooms are maintained in secondary schools in Kaduna metropolis.	72	41	115	2.7	1.2
4	Libraries are maintained in secondary schools in Kaduna metropolis	119	26	85	3.0	1.3
5	Physical and health education facilities are maintained in secondary schools in Kaduna metropolis.	80	37	113	2.8	1.3
6	Computer rooms are maintained in secondary schools in Kaduna metropolis.	121	33	86	3.0	0.9
7	Technical workshops are maintained in secondary schools in Kaduna metropolis.	84	42	101	2.7	1.1
8	Agricultural farms are maintained in secondary schools in Kaduna metropolis.	30	52	144	2.1	1.0

The above table reveals the opinion of stakeholders on the maintenance of physical infrastructure in secondary schools in Kaduna Metropolis. Their highest mean ranking response of 3.6. This implies that Physical infrastructure are not maintained, as details to this response showed that majority of the respondents disagreed with this item.

Research Question Three

RQ 3: ***What is the perception of stakeholders on the provision of infrastructural facilities in secondary schools in Kaduna Metropolis?***

This research question was answered and presented in Table 17.

Table 17: Opinions of Respondents on provision of infrastructural facilities in secondary schools in Kaduna metropolis

S/N	Item Statement	Response Categories				
		A	**U**	**D**	$\overline{\mathbf{X}}$	**SD**
1	Electrical infrastructure is provided in secondary schools in Kaduna metropolis.	120	27	81	2.8	1.3
2	Water supply facilities are provided in secondary schools in Kaduna metropolis.	168	15	45	3.8	1.2
3	Plumbing infrastructures are provided in secondary schools in Kaduna metropolis.	128	32	69	3.4	1.1
4	Sanitary infrastructure such as toilets and wash sinks are provided in secondary schools in Kaduna metropolis	135	14	79	3.1	1.3
5	Safety facilities such as fire extinguishers and smoke detector are provided in secondary schools in Kaduna metropolis.	62	39	128	2.6	1.2
6	Security facilities are provided in secondary schools in Kaduna metropolis.	119	31	78	3.2	1.4
7	Aesthetic infrastructures are provided in secondary schools in Kaduna metropolis.	60	46	121	2.9	1.0
8	Drainage infrastructures are provided in secondary schools in Kaduna metropolis.	79	40	109	3.0	1.2

The above table reveals the opinion of stakeholders on the provision of physical infrastructure in secondary schools in Kaduna Metropolis. Their highest mean ranking response of 3.6. This implies that infrastructural facilities are provided, as details to this response showed that majority of the respondents agree with this item.

Research Question Four

RQ 4: ***What is the perception of stakeholders on the maintenance of infrastructural facilities in secondary schools in Kaduna Metropolis?***

This research question was answered and presented in Table 18.

Table 18: Opinions of Respondents on maintenance of infrastructural facilities in Secondary Schools in Kaduna metropolis

S/N	Item Statement	Response Categories				
		A	**U**	**D**	$\overline{X}$	**SD**
1	Electrical infrastructure is maintained in secondary schools in Kaduna metropolis.	96	31	103	2.9	1.3
2	Water supply facilities are maintained in secondary schools in Kaduna metropolis.	130	26	73	3.4	1.2
3	Plumbing infrastructures are maintained in secondary schools in Kaduna metropolis.	95	43	91	3.0	1.1
4	Sanitary infrastructure such as toilets and wash sinks are maintained in secondary schools in Kaduna metropolis	91	28	110	2.8	1.3
5	Safety facilities such as fire extinguishers and smoke detector are maintained in secondary schools in Kaduna metropolis.	53	32	143	2.7	1.2
6	Security facilities are maintained in secondary schools in Kaduna metropolis.	100	31	96	2.8	1.1
7	Aesthetic infrastructures are maintained in secondary schools in Kaduna metropolis.	56	41	131	2.9	1.1
8	Drainage infrastructures are maintained in secondary schools in Kaduna metropolis.	78	37	111	2.7	1.3

The above table reveals the opinion of stakeholders on the maintenance of physical infrastructure in secondary schools in Kaduna Metropolis. Their highest mean ranking response of 3.6. This implies that Physical infrastructure are not maintained, as details to this response showed that majority of the respondents disagreed with this item.

Research Question Five

RQ 5: ***What is the perception of stakeholders on the provision of Instructional facilities in secondary schools in Kaduna Metropolis?***

This research question was answered and presented in Table 19.

Table 19: Opinions of Stakeholders on provision of Instructional facilities in Secondary Schools in Kaduna metropolis.

S/N	Item Statement	Response Categories				
		A	**U**	**D**	$\overline{\mathbf{X}}$	**SD**
1	Student's chairs and desks are provided in secondary schools in Kaduna metropolis.	160	17	51	3.1	1.3
2	White boards are provided in secondary schools in Kaduna metropolis.	50	31	145	2.6	1.3
3	Specimen models are provided in secondary schools in Kaduna metropolis.	85	27	114	2.9	1.1
4	Wall charts are provided in secondary schools in Kaduna metropolis	115	23	89	3.0	1.2
5	DVDs and Television are provided in secondary schools in Kaduna metropolis.	37	34	156	2.6	1.1
6	Projectors and interactive boards are provided in secondary schools in Kaduna metropolis.	26	44	157	2.5	1.0
7	Laboratory equipments are provided in secondary schools in Kaduna metropolis.	90	44	96	3.0	1.1
8	Workshop tools are provided in secondary schools in Kaduna metropolis.	75	34	121	2.8	1.1

The above table reveals the opinion of stakeholders on the provision of instructional facilities in secondary schools in Kaduna Metropolis. The responses shows that instructional facilities are provided, as details to this response showed that majority of the respondents agree with this item.

Research Question Six

RQ 6: ***What is the perception of stakeholders on the maintenance of Instructional facilities in secondary schools in Kaduna Metropolis?***

This research question was answered and presented in Table 20.

Table 20: Opinions of Stakeholders on maintenance of instructional facilities in Secondary Schools in Kaduna metropolis.

S/N	Item Statement	Response Categories				
		A	**U**	**D**	$\overline{\mathbf{X}}$	**SD**
1	Student's chairs and desks are maintained in secondary schools in Kaduna metropolis.	110	28	89	2.9	1.3
`	White boards are maintained in secondary schools in Kaduna metropolis.	41	37	151	2.4	1.0
3	Specimen models are maintained in secondary schools in Kaduna metropolis.	79	32	114	2.6	1.2
4	Wall charts are maintained in secondary schools in Kaduna metropolis	88	33	105	2.9	1.1
5	DVDs and Television are maintained in secondary schools in Kaduna metropolis.	28	34	169	2.5	1.0
6	Projectors and interactive boards are maintained in secondary schools in Kaduna metropolis.	48	32	149	2.6	1.2
7	Laboratory equipments are maintained in secondary schools in Kaduna metropolis.	92	40	98	2.9	1.1
8	Workshop tools are maintained in secondary schools in Kaduna metropolis.	73	38	118	2.6	1.1

The above table reveals the opinion of stakeholders on the maintenance of instructional facilities in secondary schools in Kaduna Metropolis. This result shows that instructional facilities are not maintained, as details to this response showed that majority of the respondents disagreed with this item.

Research Question Seven

RQ 7: ***What is the perception of stakeholders on the provision of Welfare facilities in secondary schools in Kaduna Metropolis?***

This research question was answered and presented in Table 21.

Table 21: Opinions of Stakeholders on provision of Welfare facilities in Secondary Schools in Kaduna metropolis

S/N	Item Statement	Response Categories				
		A	**U**	**D**	$\overline{\mathbf{X}}$	**SD**
1	School bus(s) is provided in secondary schools in Kaduna metropolis.	121	54	98	3.0	0.9
2	Health facilities are provided in secondary schools in Kaduna metropolis.	81	31	114	3.0	1.0
3	Canteens/food shops are provided in secondary schools in Kaduna metropolis.	106	13	107	3.1	1.4
4	Staff quarters are provided in secondary schools in Kaduna metropolis	98	26	103	3.0	1.3
5	Furniture is provided in secondary schools in Kaduna metropolis.	84	30	112	2.8	1.4
6	Staff room is provided for teachers in secondary schools in Kaduna metropolis.	55	35	137	2.5	1.2
7	Staff toilets are provided in secondary schools in Kaduna metropolis.	68	36	123	2.6	1.3
8	Parking lots are provided in secondary schools in Kaduna metropolis.	66	44	117	3.0	1.1

The above table reveals the opinion of stakeholders on the provision of welfare facilities in secondary schools in Kaduna Metropolis. The responses shows that welfare facilities are provided, as details to this response showed that majority of the respondents agree with this item.

Research Question Eight

RQ 8: ***What is the perception of stakeholders on the maintenance of Welfare facilities in secondary schools in Kaduna Metropolis?***

This research question was answered and presented in Table 22.

Table 22: Opinions of Stakeholders on maintenance of Welfare facilities in Secondary Schools in Kaduna metropolis

S/N	Item Statement	Response Categories				
		A	**U**	**D**	$\overline{\mathbf{X}}$	**SD**
1	School bus(s) is maintained in secondary schools in Kaduna metropolis.	96	25	103	3.0	1.1
2	Health facilities are maintained in secondary schools in Kaduna metropolis.	93	16	118	3.2	1.1
3	Canteens/food shops are maintained in secondary schools in Kaduna metropolis.	107	15	104	3.4	1.1
4	Staff quarters are maintained in secondary schools in Kaduna metropolis	72	31	123	2.9	1.3
5	Furniture is maintained in secondary schools in Kaduna metropolis.	68	34	122	2.8	1.4
6	Staff room is maintained for teachers in secondary schools in Kaduna metropolis.	32	40	155	2.6	1.1
7	Staff toilets are maintained in secondary schools in Kaduna metropolis.	68	36	123	2.8	0.9
8	Parking lots are maintained in secondary schools in Kaduna metropolis.	35	23	165	2.6	1.4

The above table reveals the opinion of stakeholders on the maintenance of welfare facilities in secondary schools in Kaduna Metropolis. This result shows that welfare facilities are not maintained, as details to this response showed that majority of the respondents disagreed with this item.

Research Question Nine

RQ 9: ***What is the perception of stakeholders on the provision of Sport and Recreational facilities in secondary schools in Kaduna Metropolis?***

This research question was answered and presented in Table 23.

Table 23: Opinions of Stakeholders on provision of Sport and Recreational in Secondary Schools in Kaduna metropolis

S/N	Item Statement	Response Categories				
		A	**U**	**D**	$\overline{X}$	**SD**
1	Football pitches are provided in secondary schools in Kaduna metropolis.	58	35	137	2.7	1.2
2	Volley ball courts are provided in secondary schools in Kaduna metropolis.	88	25	116	2.6	1.0
3	Basket ball courts are provided in secondary schools in Kaduna metropolis.	88	17	124	2.7	1.4
4	Table Tennis boards are provided in secondary schools in Kaduna metropolis.	111	16	100	2.6	1.3
5	Internet facilities are provided in secondary schools in Kaduna metropolis.	25	43	156	2.6	1.0
6	Lawn Tennis courts are provided in secondary schools in Kaduna metropolis.	38	40	146	2.4	0.9
7	Swimming pools are provided in secondary schools in Kaduna metropolis.	21	21	181	2.0	1.0
8	Athletics facilities are provided in secondary schools in Kaduna metropolis.	74	26	123	2.6	1.2

The above table reveals the opinion of stakeholders on the provision of sports/recreational facilities in secondary schools in Kaduna Metropolis. The responses shows that sports/recreational are provided, as details to this response showed that majority of the respondents agree with this item.

Research Question Ten

RQ 10: ***What is the perception of stakeholders on the maintenance of Sport and Recreational facilities in secondary schools in Kaduna Metropolis?***

This research question was answered and presented in Table 24.

Table 24: Opinions of Stakeholders on maintenance of Sport and Recreational in Secondary Schools in Kaduna metropolis

S/N	Item Statement	Response Categories				
		A	**U**	**D**	$\overline{\mathbf{X}}$	**SD**
1	Football pitches are maintained in secondary schools in Kaduna metropolis.	50	35	142	2.4	0.7
2	Volley ball courts are maintained in secondary schools in Kaduna metropolis.	77	29	123	2.6	1.4
3	Basket ball courts are maintained in secondary schools in Kaduna metropolis.	84	21	121	2.8	1.4
4	Table Tennis boards are maintained in secondary schools in Kaduna metropolis.	77	27	123	2.5	1.3
5	Internet facilities are maintained in secondary schools in Kaduna metropolis.	42	31	156	2.8	0.9
6	Lawn Tennis courts are maintained in secondary schools in Kaduna metropolis.	22	38	164	2.2	0.8
7	Swimming pools are maintained in secondary schools in Kaduna metropolis.	27	23	170	2.1	1.0
8	Athletics facilities are maintained in secondary schools in Kaduna metropolis.	54	32	137	2.5	1.2

The above table reveals the opinion of stakeholders on the maintenance of sports/recreational facilities in secondary schools in Kaduna Metropolis. This result shows that sports/recreational facilities are not maintained, as details to this response showed that majority of the respondents disagreed with this item.

4.2 Hypothesis Testing

This section deals with hypothesis testing. The hypotheses are related to variables identified in the research objectives. These issues include provision and maintenance of physical facilities, infrastructural facilities, instructional facilities, welfare facilities and sports/recreational facilities. The ten (10) hypotheses were tested using one way analysis of variance (ANOVA) at 0.05 level of significance. Hypothesis is rejected if the p-value is less than the level of significance set by the study.

Hypothesis 1

There is no significant difference in the perception of stakeholders on the provision of physical facilities in secondary schools in Kaduna metropolis.

Table 25: Analysis of variance of no significant difference in the perception of stakeholders on the provision of physical facilities in secondary schools in Kaduna metropolis.

Variable	Sum of squares	Df	Mean square	F	Prob	Critical value
Between groups	15.850	2	7.925	.056	.946	3.44
Within groups	32137.580	227	141.575			
Total	**32153.430**	**229**				

A look at the table 25 above shows the calculated f-ratio value (.056) at 227 df 2 and the level of 0.05. The critical value (3.44) is greater than f-ratio value (.056) and observed level of significance P(.946) is greater than 0.05. This means that there is no significant difference in the perception of stakeholders on the provision of physical facilities in secondary schools in Kaduna metropolis. Therefore the null hypothesis is retained.

Hypothesis 2

There is no significant difference in the perception of stakeholders on the maintenance of physical facilities in secondary schools in Kaduna metropolis.

Table 26: Analysis of variance of no significant difference in the perception of stakeholders on the maintenance of physical facilities in secondary schools in Kaduna metropolis.

Variable	Sum of squares	df	Mean square	F	Prob	Critical value
Between groups	7.925	2	3.9625	0.56	.946	3.44
Within groups	16068.779	227	70.7875			
Total	**16076.704**	**229**				

The table 26 above shows the calculated f-ratio value (0.56) at 227 df 2 and the level of 0.05. the critical value (3.44) is greater than f-ratio value (.595) and observed level of significance P (.946) is greater than 0.05. This means that there is no significant difference in the perception of stakeholders on the maintenance of infrastructural facilities in secondary schools in Kaduna metropolis. Therefore, the null is retained.

Hypothesis 3

There is no significant difference in the perception of stakeholders on the provision of infrastructural facilities in secondary schools in Kaduna metropolis.

Table 27: Analysis of variance of no significant difference in the perception of stakeholders on the provision of infrastructural facilities in secondary schools in Kaduna metropolis.

Variable	Sum of squares	Df	Mean square	F	Prob	Critical value
Between groups	86.3085	2	86.308	0.295	.277	3.44
Within groups	66472.3525	227	145.131			
Total	**66558.661**	**229**				

The table 27 above shows the calculated f-ratio value (0.295) at 227 df 2 and level of 0.05. The critical value (3.44) is greater than f-ratio value (2.505) and observed level of significance P (.277) is greater than 0.05. This means that there is no significant difference in the perception of stakeholders on the provision of instructional facilities in secondary schools in Kaduna metropolis. Therefore, the null hypothesis is retained.

Hypothesis 4

There is no significant difference in the perception of stakeholders on the maintenance of infrastructural facilities in secondary schools in Kaduna metropolis.

Table 28: Analysis of variance of no significant difference in the perception of stakeholders on the maintenance of infrastructural facilities in secondary schools in Kaduna metropolis.

Variable	Sum of squares	Df	Mean square	F	Prob	Critical value
Between groups	172.617	2	86.308	0.595	.553	3.44
Within groups	132944.705	227	145.131			
Total	**33117.322**	**229**				

The table 28 above shows the calculated f-ratio (0.595) at 227 df 2 and level of 0.05. The critical value (3.44) is greater than f-ratio value (1.003) and observed level of significance P (.553) is greater than 0.05. This means that there is no significant difference in the perception of stakeholders on the maintenance of welfare facilities in secondary schools in Kaduna metropolis. Therefore, the null hypothesis is retained.

Hypothesis 5

There is no significant difference in the perception of stakeholders on the provision of instructional facilities in secondary schools in Kaduna metropolis.

Table 29: Analysis of variance of no significant difference in the perception of stakeholders on the provision of Instructional facilities in secondary schools in Kaduna metropolis.

Variable	Sum of squares	Df	Mean square	F	Prob	Critical value
Between groups	806.870	2	403.435	2.505	.084	3.44
Within groups	36559.895	227	161.6057			
Total	**37366.765**	**229**				

The table 29 above shows the calculated f-ratio (2.505) at 227 df 2 and level of 0.05. The critical value (3.44) is greater than f-ratio value (1.003) and observed level of significance P (.084) is greater than 0.05. This means that there is no significant difference in the perception of stakeholders on the provision of instructional facilities in secondary schools in Kaduna metropolis. Therefore, the null hypothesis is retained.

Hypothesis 6

There is no significant difference in the perception of stakeholders on the maintenance of instructional facilities in secondary schools in Kaduna metropolis.

Table 30: Analysis of variance of no significant difference in the perception of stakeholders on the maintenance of instructional facilities in secondary schools in Kaduna metropolis.

Variable	Sum of squares	df	Mean square	F	Prob	Critical value
Between groups	403.435	2	201.716	1.252	.42	3.44
Within groups	18279.947	227				
Total	**18683.383**	**229**	**80.802**			

The table 30 above shows the calculated f-ratio (1.252) at 227 df 2 and level of 0.05. The f-cal value (.496) is less than critical value (3.44) and observed at level of significance P (.42) is greater than 0.05. This means that there is no significant difference in the perception of stakeholders on the maintenance of welfare facilities in secondary schools in Kaduna metropolis. Therefore, the null hypothesis is retained.

Hypothesis 7

There is no significant difference in the perception of stakeholders on the provision of welfare facilities in secondary schools in Kaduna metropolis.

Table 31: Analysis of variance of no significant difference in the perception of stakeholders on the provision of welfare facilities in secondary schools in Kaduna metropolis.

Variable	Sum of squares	df	Mean square	F	Prob	Critical value
Between groups	806.870	2	403.435	2.505	.084	3.44
Within groups	36559.895	227	161.6057			
Total	**37366.765**	**229**				

The table 31 above shows the calculated f-ratio (2.505) at 227 df 2 and level of 0.05. The f-cal value (2.505) is less than critical value (3.44) and observed at level of significance P (.084) is greater than 0.05. This means that there is no significant difference in the perception of stakeholders on the provision of welfare facilities in secondary schools in Kaduna metropolis. Therefore, the null hypothesis is retained.

Hypothesis 8

There is no significant difference in the perception of stakeholders on the provision of welfare facilities in secondary schools in Kaduna metropolis.

Table 32: Analysis of variance of no significant difference in the perception of stakeholders on the maintenance of welfare facilities in secondary schools in Kaduna metropolis.

Variable	Sum of squares	Df	Mean square	F	Prob	Critical value
Between groups	165.600	2	82.800	1.003	.268	3.44
Within groups	18743.896	227	82.572			
Total	**18909.496**	**229**				

The table 32 above shows the calculated f-ratio (1.003) at 227 df 2 and level of 0.05. The f-cal value (1.003) is less than critical value (3.44) and observed at level of significance P (.268) is greater than 0.05. This means that there is no significant difference in the perception of stakeholders on the maintenance of welfare facilities in secondary schools in Kaduna metropolis. Therefore, the null hypothesis is retained.

Hypothesis 9

There is no significant difference in the perception of stakeholders on the provision of sports/recreational facilities in secondary schools in Kaduna metropolis.

Table 33: Analysis of variance of no significant difference in the perception of stakeholders on the provision of sports/recreational facilities in secondary schools in Kaduna metropolis.

Variable	Sum of squares	Df	Mean square	F	Prob	Critical value
Between groups	312.350	2	156.75	.496	.610	3.44
Within groups	71457.980	227	314.793			
Total	**71770.330**	**229**				

The table 33 above shows the calculated f-ratio (.496) at 227 df 2 and level of 0.05. The f-cal value (.496) is less than critical value (3.44) and observed at level of significance P (.610) is greater than 0.05. This means that there is no significant

difference in the perception of stakeholders on the provision of welfare facilities in secondary schools in Kaduna metropolis. Therefore, the null hypothesis is retained.

Hypothesis 10

There is no significant difference in the perception of stakeholders on the maintenance of sports/recreational facilities in secondary schools in Kaduna metropolis.

Table 34: Analysis of variance of no significant difference in the perception of stakeholders on the maintenance of sports/recreational facilities in secondary schools in Kaduna metropolis

Variable	Sum of squares	df	Mean square	F	Prob	Critical value
Between groups	156.750	2	78.375			
				.248	.305	3.44
Within groups	35728.990	227	17864.49			
Total	**35885.74**	**229**				

The table 34 above shows the calculated f-ratio (.248) at 227 df 2 and level of 0.05. The f-cal value (.248) is less than critical value (3.44) and observed at level of significance P (.305) is greater than 0.05. This means that there is no significant difference in the perception of stakeholders on the provision of welfare facilities in secondary schools in Kaduna metropolis. Therefore, the null hypothesis is retained.

4.3 Summary of Major Findings

The following are the major findings of the study:

1) The study shows that Physical facilities such as classrooms, libraries, laboratories, libraries, technical workshops are provided in secondary schools in Kaduna metropolis.

2) The study found out that Physical facilities are not maintained in secondary schools in Kaduna Metropolis.
3) The study reveals that infrastructural facilities are provided in secondary schools in Kaduna metropolis.
4) The study shows that infrastructural facilities are not maintained in secondary schools in Kaduna metropolis.
5) The study reveals that instructional facilities are provided in secondary schools in Kaduna metropolis.
6) The study reveals that instructional facilities are not maintained in secondary schools in Kaduna metropolis.
7) The study shows that welfare facilities are provided in secondary schools in Kaduna metropolis.
8) The study shows that welfare facilities are not maintained in secondary schools in Kaduna metropolis
9) The study shows that sports and recreation facilities are provided in secondary schools in Kaduna metropolis.
10) The study shows that sports and recreation facilities are not maintained in secondary schools in Kaduna metropolis.

4.4 Discussion of the Findings

This study was aimed at assessing the perception of stakeholders on the provision and maintenance of school plants in Secondary Schools in Kaduna Metropolis. It objectives were to assess the following: the provision and maintenance of physical facilities in Secondary Schools in Kaduna Metropolis, the provision and maintenance of Infrastructural facilities in Secondary Schools in Kaduna Metropolis,

the provision and maintenance of instructional facilities in Secondary Schools in Kaduna Metropolis, the provision and maintenance of welfare facilities in Secondary Schools in Kaduna Metropolis and the provision and maintenance of recreational and sports facilities in Schools in Kaduna Metropolis. The hypotheses formulated were tested using one way analysis of variance (ANOVA), however to give general description of the respondents on the issues raised, frequencies and simple percentage were. The following are discussions arising from the major findings of the study.

Objective 1 and 2 assessed the perceptions of stakeholders on the provision and maintenance of physical facilities. It was revealed that there is no significant difference in the opinions of the respondents. It was agreed that physical facilities such as classrooms, laboratories, libraries and technical workshops are provided and in secondary schools. It was observed that physical facilities like computer rooms, art rooms and physical education facilities are not provided and maintained in secondary schools. It was also revealed that physical facilities were generally not maintained. Lawanson and Gede (2011) opined that "it is of utmost importance that the availability of physical facilities will duly contribute to the successful implementation of the school programme. These facilities must not only be provided, they must also be in good condition to enhance learning. This implies sound maintenance culture. This is supported by the view of Castaldi (1987) who says that "school building becomes important because of the extent that it helps in improving teaching – learning effectiveness".

The third objective of the study investigated the provision of infrastructural facilities. Responses were draw from stakeholders to gauge their perception. There is no significant difference in the opinions of the respondents on this objective. The results reveal that infrastructural facilities such as electrical, water, sanitary and

plumbing infrastructure are provided while others such as safety, security and aesthetic facilities are not provided at all. In the opinion of Olagboye (2004), existing plants will be made more functional by providing proper infrastructural facilities such as; lighting, electrical, ventilation, sanitary, water infrastructure for their efficient use . Adeboyeje (2000) adds that infrastructural facilities are mandatory in order to make the school a pleasant, safe and comfortable centre that will increase students' attendance, motivation and willingness to participate adequately in both curricula and co-curricular activities."

The fourth objective investigated the maintenance of infrastructural facilities in secondary schools in Kaduna metropolis. From the data analysis of responses from stakeholder, it shows that these infrastructural facilities where provided, are not maintained. It is essential that proper maintenance practices such as fixing broken pipes, mending or replacing electrical infrastructure such as sockets and bulbs are necessary to keep the school plant functioning optimally

Objective five, sought the opinions of the respondents on the provision of instructional facilities. There is no significant difference in the opinions of the respondents on this hypothesis. It shows that instructional facilities are generally provided but modern ones like white boards; projectors and interactive boards are not provided in secondary schools in Kaduna metropolis. The teacher is assisted in overcoming physical difficulties that could have hindered effective presentation of a given topic. Instructional equipment generally makes teaching and learning less stressful. Balogun (1982) submitted that no effective science education programme can exist without equipment for teaching. This is because facilities enable the learner to develop problem-solving skills and scientific attitudes. Electronic media are fast becoming more popular and widely used at all levels of education in the world, and

secondary schools in Kaduna metropolis in particular and Nigeria in generally must not be left behind in this trend.

The findings on objective six reveal that instructional facilities are not maintained in secondary schools in Kaduna metropolis. Instructional facilities need to be kept in good condition for them to be useful to the teacher and students.

Welfare facilities are essential for the well being of staff and students. In an attempt to analyze items under hypothesis 7 and 8, the researcher solicited the responses of respondents on the provision and maintenance of welfare facilities. It was revealed that there was no significant difference in the opinions of stakeholders on these items. All the respondents agreed that welfare facilities were provided but were not maintained in secondary schools in Kaduna metropolis. The provision of welfare facilities is essential for making work easier for staff, creating a conducive environment and attending to the general physiological and psychological needs of teachers and others within the school community.

The ninth research question sought to assess the perception of stakeholders on provision of sports and recreational facilities. The results show that there is no significant difference in the opinions of the respondents on this question. In the hypothesis related to this, the respondents agreed that sports and recreational facilities are provided in secondary schools in Kaduna metropolis. Finkel (2014) posits that "quality sports and recreational programs are needed to increase physical competence, health-related fitness, self-responsibility and enjoyment or relaxation". Undie also added that recreational activities act as an outlet for releasing tension, and anxiety and facilitates emotional stability and resilience. In furtherance of this Orunaboka and Nwachukwu (2012), posit that, "sports and recreational activities can be a force in helping students and staff socialize with each other and provides opportunities to learn

positive people skills. That is why it is imperative to provide staff and students with facilities for this purpose.

In response to research question ten, most stakeholders were of the perception that sports facilities are not maintained in secondary schools in Kaduna metropolis. The Maintenance culture in most public institutions in Nigeria is almost nonexistent. The school system is not left out. Orunaboka and Nwachukwu (2012) add that, Maintenance culture should be established by the sports or Physical Education administrator. Bucher and Krotee (2002) opined that equipment and facilities should always be maintained in a serviceable condition.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This study has focused on examining the perceptions of stakeholders on the provision and maintenance of school plants in Kaduna Metropolis. This chapter will be discussed under the following headings:

- Summary of the study
- Conclusion
- Recommendations

5.2.1 Summary of the Study

The first chapter sets the tone and direction for the study. It introduced the background to the study and described the problems the research investigated. Ten objectives and research questions were wet to guide the researcher. The objective of the study was to find out the provision and maintenance of the following: Physical facilities, infrastructural facilities, instructional facilities, welfare facilities, sports and recreational facilities. Ten null hypotheses were formulated including which include:

1. There is no significant difference in the perceptions of stakeholders on the provision of physical facilities in Secondary Schools in Kaduna Metropolis.
2. There is no significant difference in the perceptions of stakeholders on the maintenance of physical facilities in Secondary Schools in Kaduna Metropolis.
3. There is no significant difference in the perceptions of stakeholders on the provision of Infrastructural facilities in Secondary Schools in Kaduna Metropolis.

4. There is no significant difference in the perceptions of stakeholders on the maintenance of Infrastructural facilities in Secondary Schools in Kaduna Metropolis.
5. There is no significant difference in the perceptions of stakeholders on the provision of Instructional facilities in Secondary Schools in Kaduna Metropolis.

The study covers all secondary schools in Kaduna metropolis and is significant because it would give school administrators a guide to the provision and maintenance of school plants. The key variables are operationally defined to conclude the chapter.

Chapter two focuses on analyzing the works of several scholars who have written on the provision and maintenance of school plant in various climes. The conceptual frame work provides a base as it explores the concepts of school plant, provision of school plant and maintenance of school plant. The systems theory provided the theoretical frame work for the study. It is used to show how systems can be used to provide and maintain the school plant. Scholarly works on the variables; physical facilities, infrastructural facilities, instructional facilities, welfare facilities and sports/recreational facilities are reviewed. An empirical study of related works to show the relationship of the study to previous studies was carried out. It revealed some similarities to the present research, but its uniqueness in terms of scope and variables covered are highlighted.

Research methodology is covered in chapter three. The research design used is the descriptive survey design. The population of the study comprises 37 principals, 1427 teachers and 20 inspectorate staff of the Kaduna North Zonal Office of the

Ministry of Education totalling 1484. A sample of 230 was purposively selected from ten schools out of 37. A questionnaire titled "Questionnaire for the Perception of Stakeholders on the Provision and Maintenance of School Plants in Secondary Schools in Kaduna Metropolis**"** containing 80 items was deployed to collect data for the study. The instrument was validated by lecturers in the Department of Educational Administration and Planning of Ahmadu Bello University, a pilot study was carried out before it was finally deployed to the field.

The fourth chapter presented the analysis of the data in form of frequency and percentage tables. The research questions are answered using mean scores and standard deviation. The ten null Hypotheses are tested using analysis of variance (ANOVA) at 0.05 alpha level and all ten are retained. Some of the major findings are: the study shows that Physical facilities such as classrooms, libraries, laboratories, libraries, technical workshops are provided but not maintained in secondary schools in Kaduna metropolis and that infrastructural facilities are provided but not maintained in secondary schools in Kaduna metropolis.

5.3 Conclusions

The findings of the study suggest that school plants in secondary schools in Kaduna are usually provided but not maintained. It was discovered that even where physical facilities, infrastructural facilities, instructional facilities, welfare facilities and recreational and sports facilities were provided, they were not maintained. The researcher also discerned that modern school plants like projectors, white boards, interactive boards, digital libraries, internet facilities which are required for improved learning outcomes are missing from secondary schools in Kaduna metropolis.

Major stakeholders in the form of Principals, teachers and staff of the ministry of education were all unanimous in their opinion that school plants are provided but not maintained in secondary schools in Kaduna metropolis. This situation has led to continued lowering of the standard of education, poor academic achievement and even dropping out of school. Although, the principals are aware of most of the strategies for effective planning provision and maintenance of these school plants, they do not have the opportunity to do these things or employ these strategies.

Finally, it is imperative for Educational administrators to note that maintenance of school plants is important for development of best educational practices in Kaduna metropolis.

5.4 Recommendations

Based on the findings of the study and their implications, the following recommendations were made:

1) .School administrators and government urgently need to upgrade physical facilities to meet up with modern demands of secondary school education. Digital facilities should be provided in schools.
2) Physical facilities should be regularly maintained by carrying out regular face lifts and structural management.
3) Infrastructure such as electrical, water, ventilation should be provided in all secondary schools in Kaduna metropolis.
4) Regular school inspection and a good maintenance programme are recommended to protect the existing infrastructural facilities.

5) Modern instructional facilities such as interactive boards, projectors and computer should be provided in secondary schools to improve students' learning experiences.
6) Government should provide welfare facilities needed in the schools in order to create an environment for effective teaching and learning.
7) Educational Administrators should also assist schools by building maintenance costs into educational budget to take care of deterioration of the welfare facilities.
8) School and educational administrators should be more creative in the provision of spaces for sports and recreation facilities.
9) Sports and recreational facilities can be maintained in collaboration with the community where the school is located.
10) Educational administrators should seek new and innovative ways of funding school plant provision and maintenance. They should consider grants and subventions from International and local donor groups.

5.4 Suggestions for Further Studies

Due to the findings, implications and the limitations of this study, the researcher made the following suggestions for further researchers:

1) A replication of this study should be carried out in other towns and the whole Kaduna state.
2) A comparative study could be carried out on the topic based on two or more States.
3) A study on the provision of modern school plants should be carried out in Kaduna state.

4) A quasi-experimental study could be done on the strategies for improving the management of the school plants in the State.
5) A comparative study of the Provision and management of school plants in private and public schools in the metropolis should be carried out.

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APPENDIX 1

QUESTIONNAIRE FOR THE PERCEPTION OF STAKEHOLDERS ON THE PROVISION AND MAINTENANCE OF SCHOOL PLANTS IN SECONDARY SCHOOLS IN KADUNA METROPOLIS (QPSPMSP)

Educational Administration and
Planning Section,
Department of Educational
Foundations and Curriculum,
Faculty of Education,
Ahmadu Bello University, Zaria
12th October, 2014

Dear Respondent,

This questionnaire is designed to assess the Perception of School Principals, Staff of Ministry of Education Kaduna and teachers on the provision and maintenance of School plants in secondary schools in Kaduna Metropolis. This research is part of the criteria for the award of a Master's Degree in Education (M.Ed) in Ahmadu Bello University, Zaria. Your honest opinion will enhance the validity and reliability of this research.

All information will be treated as strictly confidential and only aggregate figures will be used purposely for this research.

Thank you.

Udosen, Namse Peter
(Researcher)

SECTION A: BIO-DATA

Note: please tick (√) the appropriate alternative.

.**Personal data:**

1. Name of school (if applicable): …….
2. Type : Junior secondary ( ) Senior secondary ( ) combined ( )
3. Gender : Male ( ) Female ( )
4. status:

   Teacher ( )

   Principal ( )

   Ministry of Education official ( )
5. Age: ( ) 20-25 ( ) 25-30 ( ) 30-35 ( ) 35-40 ( ) above 40 ( )
6. Qualification: a.) NCE ( ) b.) B.ED ( ) c.) B.Sc/B.A/B.tech ( ) d.) PGDE ( ) f.) M.ED ( ) g.) MBA/MSC ( ) h.) PHD ( ) others (please specify) ……
7. Subject taught: ……
8. Years of working experience: less than a year ( ) 1-5 years ( ) 5-10 years ( )

   10-15 years ( ) 15-20 years ( ) above 20 years ( )

Instructions: Tick (√) in the appropriate Colum.

SECTION B: Provision and Maintenance of Physical Facilities in Secondary Schools in Kaduna Metropolis

S/N		Responses				
		Strongly agree	**agree**	**Undecided**	**Disagree**	**Strongly disagree**
1.	Classrooms are provided in secondary schools in Kaduna metropolis.					
2.	Classrooms are maintained in secondary schools in Kaduna metropolis.					
3.	Laboratories are provided in secondary schools in Kaduna metropolis					
4.	Laboratories are maintained in secondary schools in Kaduna metropolis					
5.	Art rooms are provided in secondary schools in Kaduna metropolis.					
6.	Art rooms are maintained in secondary schools in Kaduna metropolis.					
7.	Libraries are provided in secondary schools in Kaduna metropolis.					
8	Libraries are maintained in secondary schools in Kaduna metropolis.					
9.	Physical and health education facilities are provided in secondary schools in Kaduna metropolis.					
10	Physical and health education facilities are maintained in secondary schools in Kaduna metropolis.					
11.	Computer rooms are provided in secondary schools in Kaduna state					
12	Computer rooms are maintained in secondary schools.					
13	Technical workshops are provided in secondary schools.					
14.	Technical workshops are maintained in secondary schools in Kaduna metropolis.					
15	Agricultural farms (crops and animals) are provided in secondary schools in Kaduna state					
16.	Agricultural farms (for crops and animals) are maintained in secondary schools in Kaduna state					

SECTION C: The Provision and Maintenance of Infrastructural Facilities in Secondary Schools in Kaduna Metropolis.

S/N		Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1.	Electrical infrastructure such as sockets, bulbs, etc is provided in secondary schools in Kaduna metropolis.					
2.	Electrical infrastructure such as sockets, bulbs, etc is maintained in secondary schools in Kaduna metropolis.					
3.	Water supply facilities such as boreholes and wells are provided in secondary schools in Kaduna metropolis					
4.	Water supply facilities such as boreholes and wells are maintained in secondary schools in Kaduna metropolis					
5.	Plumbing infrastructure such as pipes and taps are provided in secondary schools in Kaduna metropolis					
6.	Plumbing infrastructure such as pipes and taps are maintained in secondary schools in Kaduna metropolis.					
7.	Sanitary infrastructure such as toilets and wash sinks are provided in secondary schools in Kaduna metropolis					
8.	Sanitary infrastructure such as toilets and wash sinks are maintained in secondary schools in Kaduna metropolis.					
9	Safety facilities such as fire extinguishers and smoke detectors are provided in secondary schools in Kaduna metropolis					
10	Safety facilities such as fire extinguishers and smoke detectors are maintained in secondary schools in Kaduna metropolis					
11.	Security facilities such as chains, locks, gates and barbed wire fences are provided are provided in secondary schools in Kaduna metropolis					
12.	Security facilities such as chains, locks, gates and barbed wire fences are well maintained in secondary schools in Kaduna metropolis.					
13	Aesthetic infrastructure such as paved roads and flower patches are provided					

	in secondary schools in Kaduna metropolis.					
14	Aesthetic infrastructure such as paved roads and flower patches are maintained in secondary schools in Kaduna metropolis					
15	Drainage infrastructure are provided in secondary schools in Kaduna metropolis					
16	Drainage infrastructure are maintained in secondary schools in Kaduna metropolis					

SECTION D: The Provision and Maintenance of Instructional Facilities in Secondary Schools in Kaduna Metropolis

S/N		Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.	Students' chairs and desks are provided in secondary schools in Kaduna metropolis.					
2.	Students' chairs and desks are maintained in secondary schools in Kaduna metropolis					
3.	White boards are provided in secondary schools in Kaduna metropolis.					
4.	White boards are maintained in secondary schools in Kaduna metropolis.					
5.	Specimen models are provided in secondary schools in Kaduna metropolis.					
6.	Specimen models are maintained in secondary schools in Kaduna metropolis.					
7.	Wall charts are provided in secondary schools in Kaduna metropolis.					
8	Wall charts are maintained in secondary schools in Kaduna metropolis.					
9	DVDs and Television are provided secondary schools in Kaduna metropolis.					
10	DVDs and Television are maintained secondary schools in					

	Kaduna metropolis.					
11.	Projectors and interactive boards are provided in secondary schools in Kaduna Metropolis.					
12	Projectors and interactive boards are maintained in secondary schools in Kaduna Metropolis.					
13.	Laboratory equipment are provided in secondary schools in Kaduna state					
14.	Laboratory equipment are maintained in secondary schools in Kaduna metropolis.					
15	Workshop tools are provided in secondary schools in Kaduna metropolis.					
16	Workshop tools are maintained in secondary schools in Kaduna metropolis.					

SECTION E: The Provision of Welfare Facilities in Secondary Schools in Kaduna Metropolis.

S/N		Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1	School bus (es) is provided in secondary schools in Kaduna metropolis.					
2.	School bus (es) is maintained in secondary schools in Kaduna metropolis.					
3	Health facilities (sick bays or clinics) are provided in secondary schools in Kaduna metropolis.					
4.	Health facilities (sick bays or clinics) are maintained in secondary schools in Kaduna metropolis.					
5	Canteens/food shops are provided in secondary schools in Kaduna metropolis.					
6.	Canteens/food shops are maintained in secondary schools in Kaduna metropolis.					
7	Staff quarters are provided in secondary schools in Kaduna metropolis.					
8	Staff quarters are maintained in secondary schools in Kaduna metropolis.					
9	Furniture is provided for teachers in secondary schools in Kaduna metropolis.					
10	Furniture is maintained for teachers					

	in secondary schools in Kaduna metropolis.					
11	Staff room is provided for teachers in secondary schools in Kaduna metropolis.					
12.	Staff room is maintained for teachers in secondary schools in Kaduna metropolis.					
13	Staff toilets are provided in secondary schools in Kaduna metropolis.					
14	Staff toilets are maintained in secondary schools in Kaduna metropolis					
15	Parking lots are provided in secondary schools in Kaduna metropolis.					
16	Parking lots are maintained in secondary schools in Kaduna metropolis.					

SECTION E: Provision and Maintenance of Sports/Recreational Facilities in Secondary Schools in Kaduna Metropolis.

S/N		Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.	Football pitches are provided in secondary schools in Kaduna metropolis.					
2.	Football pitches are maintained in secondary schools in Kaduna metropolis.					
3.	Volley ball courts are provided in secondary schools in Kaduna metropolis.					
4.	Volley ball courts are maintained in secondary schools in Kaduna metropolis.					
5.	Basketball courts are provided in secondary schools in Kaduna metropolis.					
6	Basketball courts are maintained in secondary schools in Kaduna metropolis.					
7	Table tennis boards are provided in secondary schools in Kaduna metropolis.					
8	Table tennis boards are maintained in secondary schools in Kaduna metropolis.					
9	Internet facilities are provided in secondary schools in Kaduna metropolis.					

10	Internet facilities are maintained in secondary schools in Kaduna metropolis.					
11	Lawn tennis courts are provided in secondary schools in Kaduna metropolis.					
12	Lawn tennis courts are maintained in secondary schools in Kaduna metropolis.					
13	Swimming pools are provided in secondary schools in Kaduna metropolis					
14	Swimming pools are maintained in secondary schools in Kaduna metropolis					
15	Athletics facilities are provided in secondary schools in Kaduna metropolis.					
16	Athletics facilities are maintained in secondary schools in Kaduna metropolis.					

Thank you.