NATIONAL OPEN UNIVERSITY OF NIGERIA

SCHOOL OF EDUCATION

COURSE CODE: EDA 713

COURSE TITLE: SCHOOL PLANT MANAGEMENT

COURSE GUIDE

EDA 713
SCHOOL PLANT MANAGEMENT

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INTRODUCTION

EDA 713- School Plant Management focuses on what it takes to manage the physical plant of a school – the school buildings, grounds, service facilities and other structures that make up a school – in order to make sure that teaching and learning take place effectively with minimal interruption. The major aim of the course is to enable you acquire the knowledge, skills, and competences that are necessary for managing a school plant.

It is a three-credit unit course that addresses the basic concepts and principles, facts and knowledge in key functional areas of school plant management – school plant planning, design, construction, occupancy and utilisation. It also deals with school plant operation and maintenance.

WHAT YOU WILL LEARN IN THIS COURSE

The course is structured in modules and units. Apart from the first module which gives you an overview of the course, other modules and units are organised according to the groups of concepts, knowledge, information and activities that characterise the different stages of school plant management. Efforts have been made to be as explanatory as possible in this course and make it learner-oriented. It is hoped that you will find it interesting and useful for meeting your personal objectives.

This course guide is designed to provide you with relevant information about the course.

COURSE AIMS

This course aims at enabling you to:

(a) learn the basic concepts in school plant management
(b) learn the steps and activities involved in school plant planning, design and construction
(c) learn how to use the school plant effectively and efficiently
(d) acquire the necessary knowledge and skills in school plant maintenance and operation.

COURSE OBJECTIVES

In order to achieve the above-stated aims, there are some specific objectives to be achieved under each unit. Those specific objectives are what you are expected to have learnt after you have studied each unit. In sum, at the end of this course, you should be able to:

- explain the term ‘school plant management’
- state the major functions involved in school plant management
- highlight the objectives of school plant development
- describe the major factors that affect the character and design of school plants
- state the conditions for success in school plant planning
- describe the roles of the educational planner, the architect, the owner, and other relevant professionals in school plant development
- explain the meaning of educational specifications
- describe the format and contents of educational specifications
- advertise for tenders
- describe the contents of the contract document
- describe the different types of school maintenance services
- explain school culture
- discuss how to reshape a school’s culture
- explain post-occupancy evaluation
- discuss the merits and possible demerits of post-occupancy evaluation.

WORKING THROUGH THE COURSE

The course is organised into four modules. The first three modules are made up of four units each, while the fourth one contains three units. In all, you are expected to study 15 units in this course. Module 1 gives you an overall picture of what is involved in school plant management. The units in this module focus on explaining the meanings of school plant and school plant management; offering some explanations on how some societal and environmental factors affect the character of school plants; highlighting the importance of school plant; and outlining some challenges for school plant managers and school administrators in Nigeria.

Module 2 addresses school plant planning. It discusses the basic conditions for successful school plant planning; the various studies involved in assessing the educational need of a community; how to translate the identified needs into facility needs; and how to select a school site.

Module 3 is concerned with school plant design, construction and occupancy. In the units that make up this module, focus is on those activities embarked upon by the architect and the roles of the owner and other players concerned with the design and approval of working drawings, the award of contract and construction of the buildings and

the taking over of the building by school people and the subsequent evaluation of the building.

Module 4 is on school plant operation and maintenance. The module focuses on effective and efficient operation and utilisation of the school plant; the various types of maintenance services need to keep the school plant functional; and how to develop healthy maintenance culture required to keep the school plant in good shape.

In order to reinforce learning, some assignments are given and a list of suggested reading materials is given at the end of each study unit. You are advised to go through the exercises so as to increase your grasp of each unit's content. This will also enable you to prepare adequately for the final examination.

COURSE MATERIALS

The major components of the course include the following:

1. Course Guide
2. Study Units
3. Textbooks and References
4. Assignment File
5. Presentation Schedule

STUDY UNITS

The following are the modules and units in this course:

Module 1 School Plant Planning: An Overview

Unit 1 The Concept, Nature and Objectives of School Plant Management
Unit 2 Importance of the School Plant
Unit 3 Factors Affecting School Building Design and Character
Unit 4 The Nigerian Experience and the Challenges

Module 2 School Plant Planning

Unit 1 Basic Considerations in Planning
Unit 2 Determining Educational Needs
Unit 3 Educational Specifications
Unit 4 Site Selection

Module 3 School Plant Design, Construction and Occupancy

Unit 1 The Design Phase
Unit 2 The Construction Phase
Unit 3 Furniture and Equipment
Unit 4 Occupancy and Post-Occupancy Evaluation

Module 4 School Plant Operation, Utilisation and Maintenance

Unit 1 School Plant Operation and Utilisation
Unit 2 School Plant Maintenance
Unit 3 Promoting School Plant Maintenance Culture

TEXTBOOKS AND REFERENCES

A list of the references and materials for further reading has been supplied at the end of each unit. The materials contain some additional information that will enhance what you have learnt. For instance, they may contain further illustrations or examples, pictures and other details that you may find useful. It will be good if you can read any other relevant texts that you may lay your hands on, in order to gain more knowledge and skills at the end of the course.

ASSIGNMENT FILE

In this file, you will find the details of the work you must submit to your tutor for marking. The marks you obtain will form part of your total score for this course.

ASSESSMENT

There are two aspects to the assessment of the course. First are the Tutor-Marked Assignments (TMA) and there is a written examination. You are advised to be sincere in attempting the exercises. In attempting the assignments, you are expected to apply the information, knowledge and techniques gathered during the course.

The assignments must be submitted to your tutor for formal assessments, in accordance with the deadlines stated in the presentation schedule and the assignment file.

TUTOR-MARKED ASSIGNMENT

You will be given some assignments to do at the end of each unit. These assignments constitute your continuous assessment. You are expected to complete four of these assignments for grading. These compulsory

assignments account for 30% of your total scores in the course. The assignments will be administered by your course facilitator who is expected to return your papers to you after grading them. You are expected to submit at least three assignments before you are allowed to take the final examination.

FINAL EXAMINATION AND GRADING

The final examination constitutes 70% of the total scores in the course. The examination will be the final assessment for the course. You will be duly informed as the examination date approaches.

PRESENTATION SCHEDULE

Your course materials give you important dates for attending tutorials and the timely completion and submission of your Tutor-Marked Assignments. Do remember that you are required to submit all your assignments by the due date. You should guard against falling behind in your work.

HOW TO GET THE MOST FROM THIS COURSE

In distance learning, the study units replace the conventional university lecturer. This is one of the great advantages of distance learning; you can read and work through specially designed study materials at your own pace, and at a time and place that suit you best.

Each of the study units follows a common format. The first item is an introduction to the subject matter of the unit and how a particular unit is integrated with the other units and the course as a whole. Next is a set of learning objectives. These objectives let you know what you should be able to do by the time you have completed the unit. You should use these objectives to guide your study. When you have finished the unit, you must go back and check whether you have achieved the objectives. If you make a habit of doing this you will significantly improve your chances of passing the course.

Self-assessment exercises are interspersed throughout the units. Working through these exercises will help you to achieve the objectives of the unit and prepare you for the assignments and the examination. You should do each exercise as you come to it in the study unit. There will also be numerous examples given in the study units; work through these when you come to them, too.

FACILITATORS/TUTORS AND TUTORIALS

There will be tutorial sessions in support of this course. As soon as you are allocated a tutorial group, you will be notified of the dates, times and location for the tutorials, together with the name and phone number of your tutor.

Your tutor will mark and comment on your assignments; he/she will keep a close watch on your progress and on any difficulties you may encounter and provide assistance to you during the course. You must mail your tutor-marked assignments to your tutor well before the due date (at least two working days are required). They will be marked by your tutor and returned to you as soon as possible.

Do not hesitate to contact your tutor by telephone, e-mail, or via the discussion board if you need help. The following might be circumstances in which you would find help necessary.

Contact your tutor if:

- you do not understand any part of the study unit
- you have difficulty with the assignments/ exercises
- you have a question or problem with your tutor's comments on any assignment or with the grading of an assignment.

You should try your best to attend tutorials. This is the only chance to have face to face contact with your tutor and to ask questions. You can raise any problem encountered in the course of your study. To gain the maximum benefit from the tutorials, prepare a list of questions before hand, you will learn a lot from participating actively in the discussions.

SUMMARY

In this course, you are expected to acquire the knowledge and skills required for effective management of a school plant. It involves being familiar with some basic concepts, mastering some steps and activities involved in school plant planning, and knowing the activities involved in school plant design and construction. It also involves familiarising yourself with the techniques of orientation for occupancy and evaluation of a new building as well as the skills for operating, utilising and maintaining a school plant. The modules and units have been organised to enable you meet these ends. It is expected that you will enjoy the course as you study it.

We wish you success and hope that you will find the course both interesting and useful. Good luck.

MAIN COURSE

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MODULE 1 SCHOOL PLANT PLANNING: AN OVERVIEW

UNIT 1 THE CONCEPT, NATURE AND OBJECTIVES OF SCHOOL PLANT MANAGEMENT

CONTENTS

1.0 INTRODUCTION

Nigeria, like other nations of the world, has an obligation to prepare her children and youth for life as adults in a world characterised by rapid social, economic and technological changes. The federal and state governments have invested huge resources in setting up educational institutions from primary through the tertiary levels of the educational system for this purpose. The development, maintenance and operation of these institutions are an important aspect of public school administration in the country. The extent to which this important function is effectively performed will determine the extent to which the country will meet its educational goals and aspirations for the young ones. Effective and efficient management of institutions of learning in the country is as important as building the structures.

In this first unit of the first module, which is an overview of school plant management, you will be exposed to the meaning of school plant and school plant management and also what school plant management is all about. We shall begin by learning the meaning of school plant.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the meaning of the term 'school plant'
- state the main tasks involved in managing a school plant
- outline at least four major objectives of school plant development.

3.0 MAIN CONTENT

3.1 Meaning and Nature of School Plant

The democratisation of education in Nigeria has led to a remarkable increase in the number of schools all over the nation. Every town and community in the country has either a primary or secondary school or both. Some communities have tertiary institutions. People recognise these institutions as places for the education of children and youth. They are commonly characterised by school buildings and other features on the land on which the buildings are erected. Some writers define the school plant in terms of these characteristic features or physical components of schools. Adeboyeje (1994), for instance, defines it as the buildings, classrooms, and corridors, playgrounds and other lands. Some other writers however, prefer to define it in terms of its functions.

Hagman (1956) defines the school building as an instrument in education. Knezevich (1975: 562) states that the school site and the school building are part of the broad concept known as the school plant. This implies that the term 'school plant' is more than the school building and the piece of land on which it is situated. For our present purposes, the term 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 other objects used for implementing or supporting the implementation of an educational programme.

The term as used here, shares the same meaning as what some authors refer to as school facilities. According to *Encyclopedia of Education* (2002), the school facility consists of not only the physical structure and the variety of building systems, such as mechanical, plumbing, electrical and power, telecommunications, security, and fire suppression systems. The facility also includes furnishings, materials and supplies, equipment and information technology, as well as various aspects of the building grounds, namely, athletic fields, playgrounds, areas for outdoor learning and vehicular access and parking.

Knezevich (1975), aptly described the school plant as the space interpretation of the curriculum. According to him, the curriculum finds its physical expression in the construction and arrangements of the school plant. The number and types of equipment and materials available, the sizes of learning spaces within the school building, their relations to each other, and nature of the learning environment, all have an influence on the methods and quality of teaching and learning. Outside the school buildings and other structures, the size and nature of the school site determine, to a great extent, the type of outdoor instructional and recreational activities that can take place in the school.

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. The whole school plant, and not just the school building, can thus be conceived as an instrument in education (Hagman, 1956). The prime reason for its existence is for the implementation of the school programme.

It is the instructional programme that determines the types and sizes of learning spaces provided in the school plant. The equipment and instructional materials available in the school plant determines to a large extent how students are organised for instruction and the teaching methods adopted by teachers in the school. The numbers and sizes of spaces for instructional and non-instructional activities depend, of course, on the size of the school enrolment.

SELF-ASSESSMENT EXERCISE

i. What do you understand by the term ‘school plant’?
ii. Describe the two major functions of the school plant.
iii. In what ways does the instructional programme influence the nature of the school plant?

3.2 The Meaning of School Plant Management

The term ‘management’ has been defined in various ways by different authors. Griffin (2003: 6) defines it as “a set of functions directed at the efficient and effective utilisation of resources in the pursuit of organisational goals.” Terry and Franklin (2003: 4) are more specific about the activities involved in the performance of this function. According to them:

> Management is a specific process consisting of the activities of planning, organising, actuating, and controlling, performed to determine and

> accomplish stated objectives with the use of human beings and other resources.

Weihrich and Koontz (1999) define it as the process of designing and maintaining an environment in which individuals, working together in groups, efficiently accomplish selected aims.

A common idea in these and many other definitions is that management is goal-directed. These definitions convey the idea that management involves a series of on-going activities, individuals and groups working together using resources efficiently and effectiveness. All these ideas and terms are applicable to the management of the school plant. School plant management entails making and carrying out series of decisions in building a school plant according to need. It also involves operating and using it effectively and efficiently, while ensuring that it is in a functional state as the educational programme is being implemented.

School plant management involves a number of on-going and related activities – determining the need for school plants, educational programme planning, school facility or building design, building construction, furnishing and equipping the school, school plant operation, utilisation and maintenance and school plant modernisation or renovation, as the need arises. Fenker (2004) states that facilities management is a process that ensures that buildings and other technical systems support the provisions of an organisation. School plant management ensures that school buildings and grounds, equipment, materials, technical and other service systems, facilitate and support the provision of education by a school.

The responsibility for managing the school plant rests with the head teacher or the school principal. The school head may not be knowledgeable in some aspects of school plant management such as school facility design and building construction, but his/her inputs and, in some cases, the inputs of other school staff during decision making in these areas may be necessary as it is the principal or head teacher and the staff that will make use of the buildings upon completion. It is the responsibility of the head of the school to ensure that the school plant is regularly maintained, i.e., kept at as near its original state as possible. It is also part of his/her responsibilities to ensure that the school plant is open for use effectively and efficiently on daily basis and that it is kept neat and tidy always.

In achieving these and other ends for which the school plant has been built, the head teacher or principal must make use of teachers, other school staff and students, detailing their duties and roles and coordinating their efforts to ensure that the right things are done at the

right time. Effective school plant management ensures that school facilities are effectively used for teaching and learning with little or no interruption.

SELF-ASSESSMENT EXERCISE

i. Define 'management' in your own words.
ii. What is school plant management?
iii. Why should school heads pay more attention to school plant management?

3.3 Objectives of School Plant Development

We stated earlier that the major reason for building a school is to implement an educational programme. A smooth implementation of an educational programme can only occur and the chances of actualising its goals enhanced if the school plant possesses some desirable qualities or standards. Ensuring that a school plant meets these standards should be the major concerns of all efforts directed at planning, designing and constructing school plants. In addition to facilitating the implementation of the educational programme, some of the qualities are necessary for the all-round development of children and youth and the well-being of the school staff.

Englehardt (1968) refers to these qualities as objectives of major concern in school plant planning, design and construction. He discusses six of these major objectives and offers some suggestions on how they can be accomplished. The following objectives should be put in focus when planning and constructing school plants:

Spatial adequacy and desirability

One very important objective of school plant planning that is directly related to the implementation of the educational programme is the provision of adequate and appropriately organised spaces to facilitate and support teaching and learning activities. There should be enough space to accommodate the present school enrolment and any possible increase in student population in foreseeable future. It is desirable that learning spaces be adequate for both individual and group work. Adequacy of space is also sought for administrative and other offices needed for rendering special services to students and staff and for storing materials and supplies for the school. Provision of adequate spaces for outdoor learning and recreation should also feature as one of the objectives of school plant development.

Health and safety

Ensuring the safety, security and good health of the learner as well as other staff of the school is another objective that any school plant planner should accomplish. All buildings should be structurally adequate and enough safety features, such as fire alarm systems, firefighting equipment, and emergency exits should be provided. Learning takes place effectively in an environment in which the learner feels safe and secure. Toilet and other sanitation facilities to meet the needs of the students and staff should be provided.

Adaptability

School buildings are expensive to construct and are usually intended for long-term use. While in use, there may be some changes in the educational programme; new subjects may be introduced requiring new methods of teaching or equipment that may require special storage facilities; there may be unexpected increase in school enrolment and any unforeseen development that may hasten the obsolescence of the buildings. In order to cope with such unforeseen circumstances, it is a desirable objective of school plant planning and construction to make the buildings adaptable.

Aesthetics

Providing a school plant with beautiful surroundings is another objective of school plant planning. Attractive school environment with well designed buildings and other structures may not only stimulate learners' interest in schooling and appreciation of creative arts, but it may also engender a sense of belonging and pride for their school. Such attractive-looking school and beautiful surroundings are also a source of pride to the members of the local community of the school.

Durability

Owing to the expected long life span of school buildings and high construction costs, durability is one of the objectives to be targeted when planning and constructing them. Durability in this case should not imply rigidity of the structures; this is because of some inevitable changes that often occur and call for flexible structures. Rather, it calls for the use of high quality building materials and competent workmanship so that the completed school plant can be put into good use for a long time; and at the same time, it should be easily adaptable as the need arises. The use of high quality building materials may be initially expensive but it eventually pays off in terms of relatively low cost of maintenance. It

should be noted that many writers refer to these objectives as attributes or characteristics.

SELF-ASSESSMENT EXERCISE

i. State any three objectives of school plant planning and construction.
ii. Why is the accomplishment of each of the objectives you have stated necessary?

4.0 CONCLUSION

The school plant is a vital instrument for implementing educational programmes. School administrators have important roles to play in developing it and making it function effectively. It is only through adequate planning and good workmanship that the desirable qualities which a school plant should possess to enable it function effectively can be achieved.

5.0 SUMMARY

In this unit, you learnt the meanings of school plant and school plant management; the major tasks involved in school plant management – school plant planning, construction, maintenance and operation have been highlighted. You also learnt that some of desirable qualities or the major objectives which school plant planners and managers should aspire to actualise when planning and constructing school buildings and other structures are spatial adequacy for all learning, recreational and other activities, health and safety of pupils and school staff, adaptability of the building structures, aesthetics and durability.

6.0 TUTOR-MARKED ASSIGNMENT

The school plant can be either a major limiting or facilitating factor in the implantation of educational programmes. Discuss.

7.0 REFERENCES/FURTHER READING

Encyclopedia of Education. (2002). Farmington Hills, M.I.: Gale Group Inc.

Fenker, M. (2004). 'Organisational Change, Representations, and Facilities'. In: K. Alexander (Ed.) *Facilities Management: Innovation and Performance.* UK: Taylor and Francis.

Griffin, R.W. (2003). *Fundamentals of Management: Core Concepts and Applications.* New York: Houghton Mifflin Company.

Hagman, H. L. (1956). *Administration of Elementary Schools.* New York: McGraw Hill.

Terry, G. R. & Franklin, S. G. (2003). *Principles of Management.* Kamataka, India: AITBS Publishers.

Weihrich, H. & Koontz, H. (1993). *Management: A Global Perspective.* New York: McGraw-Hill.

UNIT 2 IMPORTANCE OF SCHOOL PLANTS

CONTENTS

1.0 INTRODUCTION

In the last unit, you learnt the meaning of school plant and the desirable attributes a school should possess. In this unit, you will learn about the importance of the school plant in the implementation of educational programmes and the various ways in which it is significant to students and to their academic performance, as well as to teachers and the members of the local community.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain how a school plant can affect the implementation of an academic programme
- state the ways in which a school plant can affect a child's behaviour and academic development
- explain why school heads should show concern for effective school management
- discuss the importance of the school plant to the members of the school's local community.

3.0 MAIN CONTENT

3.1 Impact on the Implementation of Education Programme

The character of a school plant determines, to a considerable extent, the types and quality of curricular and co-curricular activities that take place in it. The nature and size of the school building determine the shape and size of the classrooms. The shape and size of the classrooms with their

equipment, furniture and the types and variety of educational materials available affect the ways in which learners can be organised for instruction, the possible methods of teaching that can be adopted by teachers and the types of learning activities that the students can be engaged in. If home economics, technical education, music and fine arts, for instance, are part of the curriculum, the appropriate rooms and workshops must be provided with the relevant equipment and materials. Otherwise, the implementation of those aspects of the curriculum will be greatly impaired.

Practical lessons cannot be organised for science students in schools without science laboratories, or in schools with science laboratories but without the relevant materials and equipment. The only option for students in such schools who may wish to sit for science subjects in external examinations is the 'Alternative to Science' paper. Whether or not the school building is adequately planned to accommodate the educational programme, it affects the life and activities that go on within it. Hagman (1956) describes the life that goes on within a school building vividly:

> …It may permit and encourage freedom, activity, group study habits, development of a sense of the beautiful and other aspects of a well-rounded educational programme. Within its walls and on the grounds around it, it may be developing good learning situations for all children. Or, it may by its appearance, arrangement, structure, or size inhibit fine educational experiences.

This is in agreement with Miller's (1965) observation that a school plant can either be an effective tool or a barrier to education. If a school's facilities are poorly planned and designed with inadequate number, sizes, and arrangement of learning spaces, it may hinder the operation of the educational programme. As well, poor planning and design of facilities may lead to undesirable behaviour of learners and inability of the school to achieve its educational goals. In this regard, Nwagwu (1978) observes that the quality of education that a child receives is directly related to the availability or lack thereof of physical facilities and the overall atmosphere in which learning takes place.

The location, size and nature of the school plant affect the types and number of curricular and co-curricular activities that can take place in and outside it. A school built on a small site, for instance, may not have enough space for playgrounds and recreational facilities. The same thing can be said about a school plant in a swampy place or difficult terrain.

The physical and health education aspect of the educational programme can hardly be adequately implemented in schools built on such sites. The extent of outdoor learning in such schools may also be severely limited. Indeed, there is no doubt that attainment of educational objectives will be almost impossible without an adequate school plant.

SELF-ASSESSMENT EXERCISE

i. Using specific examples show the different ways in which a school plant can affect the implementation of an educational programme.
ii. List the outdoor learning and recreational activities that may not be possible in schools on small sites.

3.2 Influence on Learners and Teachers

The school plant is of special significance to learners; for children who are just entering the school, for the first time in particular, "the school building needs to be interesting and inviting" (Cramer and Domian, 1960). This is necessary, according to these authors, because the impressions of those first years may have an impact on the attitude of the child towards school. Writing in the same vein, Appleton (1975) states that the school building generates its own ethos to the child by virtue of its appearance, design and general environment in which it is set. Fagbulu (1972) is of the opinion that a child's sense of belonging to a school is strengthened if its physical plant is sound, functional and pleasing to the eye.

From the foregoing, we can infer that the nature and look of a school plant, especially the buildings, seem to be some of the important factors that influence children's attitude towards attending school and, perhaps towards education as a whole. It follows then that any amount of money spent on beautifying our school buildings, especially those at the primary level of education, is money well spent.

In addition to its impact on the attitudes of, especially, the young ones towards school and its usefulness to them for formal learning, a good school plant with the necessary facilities plays a major role in fostering the development of good sanitation and healthful habits among children and staff. Such a school plant meets their physical needs for shelter without which teaching and learning activities can hardly go on smoothly. When teachers work in well-equipped and well-furnished school plants with good air quality, rich natural lighting and under suitable thermal and acoustic conditions, their levels of motivation and stability on the job increase. The physical plant is so important in education that if it does not meet certain standards or if its quality or

condition deteriorates, it may have some negative consequences on the teaching and learning process, as well as on the staff and students.

3.3 Impact of the Physical Conditions of School Plants

There is growing evidence that the physical condition of a school is related to students' academic achievements and behaviour as well as the well-being of staff and students. A study of The District of Columbia schools in 1991, for instance, found that standardised achievement scores among students in poor condition were six per cent lower than those in fair condition and 11 per cent below schools in excellent condition. Another study of Virginia high schools in 1993 found that student scores on achievement tests, adjusted for socio-economic status, were up to five per cent lower in buildings with lower quality ratings (American Federation of Teachers, 1997).

Even some building design features have been shown to have measurable influence upon student learning. Among the influential features and components found to have negative impact upon student performance in buildings where their deficiencies exist are those impacting lighting, temperature, acoustics and age (Earthman, 2002). Results of some studies on specific quality factors have been summarised by Young, Green, and Roehrich-Patrick (2003) as follows:

- Students had higher achievement scores in newer facilities. As the age of the facilities decreased, there was a corresponding increase in mathematics, reading, and composition.
- There were fewer disciplinary incidents in newer facilities.
- Attendance records were better in the new facilities.
- As the condition of the facility improved, achievement scores improved.
- Stimulating environments promoted positive attitudes in students.

Some studies have established that the physical conditions under which teachers work have direct positive and negative effects on their morale, sense of personal safety, feelings of effectiveness in the classroom and the general learning environment (American Federation of Teachers, 1997). Poor ventilation in schools, accumulation of dust and growth of mould in ceilings and walls can lead to respiratory infections, headaches, and sleepiness among students and staff (Environmental Protection Agency, 2000). Poor air quality has been linked to student absenteeism often due to asthma and other respiratory diseases (American Lung Association, 2002).

SELF-ASSESSMENT EXERCISE

i. What are the possible effects of attractive school buildings on children attending the school?
ii. What are the various ways in which limited equipment and small site can affect the implementation of named educational activities?
iii. State two ways in which poor condition of the school plant can affect students.

3.4 The School Plant and Local Community Members

The school is also of some significance to the members of the local community. In some communities in Nigeria, especially the rural ones, the school plant may represent the costliest public investment in the neighbourhood which must be protected from destruction, vandalism or theft. This is usually the case if the community members had contributed in one way or the other in setting up the school buildings or done any type of work on the school grounds or surroundings. In some communities, the school may be the only public establishment close to the people and which signifies 'government presence' in the area, and some of them may even be given employment there as teaching and non-teaching staff.

The school plant in both urban and rural areas of the country is a structure through which many parents hope to realise their dreams and educational aspirations for their children. To them, the school presents a window of opportunity to both the rich and the poor, more so with the democratistion of education in the country. A well-designed and attractive school plant is often a source of pride to the local citizens and generates goodwill for public education among them. According to Young, Green, and Roehrich-Patrick (2003), the quality of school facilities influences citizen perception of schools, which in turn, influences their support for public education.

The school plant serves a number of important purposes for members of the community in both rural and urban areas of the country. It often serves as a venue for different social functions like civic reception of some important visitors and dignitaries, wedding receptions, community or town meetings and other occasions and functions that require the gathering of a large number of people. In fact, in many towns and cities, the school site is the only area where there may be adequate space to accommodate the crowd that show up at such functions. Its importance as a venue to the young ones as an arena for recreation after school hours should not be underrated.

In addition to social functions, the school plant is often used as a venue some non-formal education programmes like adult or mass literacy programme, and also serve as study centres for some university and colleges of education part time programmes. In fact, without the cooperation of the school heads who allow the use of their school plants, it would have been very difficult for tertiary institutions in the country to operate their sandwich programmes.

4.0 CONCLUSION

The school plant is undoubtedly a very important instrument in education. Its effectiveness in the implementation of an educational programme and in meeting the physical needs of students and staff of a school and in impacting on students' academic achievement depends, however, on its physical condition or quality. The school plant is also of much significance in the school's local community.

5.0 SUMMARY

In this unit, you learnt about the different ways in which the school plant is important for implementing the educational programme and in realizing some educational objectives. You also learnt about its important role in meeting the physical needs of both students and their teachers, the impact of the physical conditions of the school plant on student and staff behaviour and on educational outcomes. Finally, you learnt about the importance of the school and the school plant to local community members as well as to some tertiary institutions in the country.

6.0 TUTOR-MARKED ASSIGNMENT

Discuss the significance of the school plant to:

a. a school principal
b. a local community citizen.

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UNIT 3 FACTORS AFFECTING THE CHARACTER OF SCHOOL PLANTS

CONTENTS

1.0 INTRODUCTION

You have learnt about the importance of the school plant in the teaching and learning process and even in the local communities. Even though schools at the same level of educational system perform the same functions or are expected to be implementing the same educational programme, there are certain attributes or features which make a school plant what it is and distinguish it from another school plant. Within the same school the buildings are not of the same design or shape, size, internal structure and construction materials; that is to say, the buildings differ in character. The same is also true with school plants in different locations or different rural and urban communities. These differences in the characters of school buildings and entire school plants are due to the different factors that must be taken into consideration when deciding on whether or not to have a school building or a school plant and when taking decisions on planning, designing and constructing it. You will learn about some of these factors in this unit.

2.0 OBJECTIVES

At the end of this unit you should be able to:

- list the major factors that influence decision making on school plant development
- explain the effect of these factors on the design and character of school plants.

3.0 MAIN CONTENT

3.1 Factors affecting the Character of School Plants

It is important to note that there are a number of factors that can possibly affect what a school plant or a school building looks like, its size, location, the relationships of instructional and non-instructional spaces and the state of repairs after construction etc. In this unit, you will learn about the major factors that affect the decisions on whether to have a new school plant or building and decisions on its development. The listing is not exhausted and discussion of these factors below is not necessarily in their order of importance. The ones discussed here are just indicative of the influences of the factors.

3.1.1 Social and Economic Factors

One of the reasons for establishing schools is to cater for the social and economic needs or life of the society. Educators, educational planners, architects, other relevant professionals and local citizens are expected to take note of major developments and trends in the social and economic life of the society or communities in which they operate. It is these developments that indicate what they need to do about education and the type of school plant or school buildings which they will set up or modify.

The current demand for technicians and technologists, scientists and skilled researchers in Nigeria; the tendency for almost every school leaver to aspire to enter the university; the preference of university education to polytechnic and other forms of tertiary education by school leavers; the rising unemployment rate, youth restiveness and the call or need for the street children and *almajiris* to go to school are some of the social and economic developments in the country which should guide decisions on the development of education and the appropriate school plants.

It does not suffice to design and construct facilities that address the present developments. As it is not possible to set up new school buildings or modify existing ones immediately changes occur because of financial and other constraints, there is the need to look far into the future, predict the consequences of future developments in the social and economic life of the society and draw their implication for school plant development. The anticipated future state of the economy, for instance, will determine how much money can be invested in education, the design of the school buildings including the aesthetic features and the period for the take-off of construction work.

3.1.2 Educational Programme

It may have been obvious to you by now that a primary consideration in all efforts geared towards the development of school plants is the nature of the educational programme that it is to serve and how that programme is to be organised. The aims and objectives of the programme will determine the types of teaching and learning activities that will take place, the types, sizes and relationships of learning and non-learning spaces. It is the nature of the educational programme offered at an institution that makes the difference between the characters of a technical college plant and that of a grammar school, or between a primary and a secondary school plant.

The curriculum offered in a secondary school, for instance, will determine the types of learning spaces to be included in a school plant. The internal structures of buildings in schools where lecture method of teaching prevail will be different from those in which practical work and experimentation are emphasised. If a school offers science subjects, there will be laboratories for the study of those subjects. If agricultural science is in the curriculum of a school, a place will be set aside on the school grounds for a school farm or garden. There will be an art room in a school where fine arts is offered. It is usual to see pieces of art work, clay models, sculptures, and other artifacts adorning different parts of such a school. If sports and games are given adequate emphasis in the curriculum of a school, there will be provision for football fields, lawn tennis and for other games and a space for sporting events.

The character of a school plant is also affected by the non-instructional components of the educational programme. Schools that offer mid-day meals to their students will have relevant facilities for that service. The same thing applies to those that provide health, guidance and counselling services to their students.

3.1.3 Population and School Enrolment

Before a school plant is built or an existing one expanded, there must be a need for it. The number of children and youth to be catered for is a key factor influencing this need. This number at any point in time depends on the rate of population increase in a society. Presently, the population of Nigeria is estimated at over 150 million with a growth rate of about three per cent per annum and there are no indications that this rate will decrease in the near future. The implication is that the present pressure for additional classrooms is bound to continue or even increase in future.

Naturally, those communities that have few children of primary school age will have small primary school plants while those with large

numbers will have bigger plants. Those with enough children for both primary and secondary education will, under normal circumstances, have both types of institutions. Increase in school enrolments at any level of the education system necessitates new school buildings or expansion of existing ones. The size of school enrolment in each case will reflect the numbers and sizes of the classrooms while the types and sizes of the furniture and some equipment will reflect the ages of the pupils or students.

3.1.4 Cultural Values

Educational programmes in different countries of the world are planned and implemented according to some cultural and religious values held highly in their societies. These values are reflected in various ways including curricular offerings with their attendant equipment and materials, the teaching methods adopted and the ways in which pupils or students are grouped for learning and other purposes.

Our societal values of democracy and the attendant widening of access to education at almost every level of the educational system are likely to influence the provision and organisation of education for children and youth in future. A community's value for the education of its children and youth is often indicated by the amount of care it exercises over its school plant. Such communities often respond to the maintenance needs of their schools and always ensure that it is in a functional state. A community's values of democracy and respect for children's rights also inform the efforts at providing special institutions, equipment and materials for the education of physically and mentally challenged children. Where one of the values of a community is cooperation, for instance, group work is encouraged and this necessitates the provision of large classrooms for different types of activities.

Religious values and beliefs often inform the building of separate educational institutions especially at the secondary level for boys and girls. The provision for games, recreational and other activities differ in both types of institutions. The rigid demarcation of girls' and boys' hostel areas in some co-educational boarding schools, with very high walls and no link whatsoever between the two areas, is based on religious and moral values of a community or society.

3.1.5 Developments in the Building Materials Industry

Some developments in the building industry have some impact on the design and construction of some educational facilities. New building materials appear in the market from time to time. Some of them which may be found very useful for constructing or renovating school plants

include new types of bricks, fancy blocks, floor and wall tiles of various types and sizes, plastics, electrical fittings and lighting systems, roofing sheets of various types, shapes and sizes and so on.

The use of these materials, if they are affordable, may not only change the look of especially old school plants, but may also convey certain advantages like prolonging the useful life of the school plant, reducing noise in the buildings, improving the ventilation, ensuring better control of light, reducing the cost of maintenance and improving the aesthetic beauty of the school buildings and other structures.

3.1.6 Developments in Educational Practices

Among other factors that influence the structure and appearance of school plants are the developments in the design and construction profession. No educational system is an island unto itself. Educational architects, administrators and professionals in the building industry often incorporate their ideas of what they consider attractive and affordable designs from the educational systems of other countries in their attempts at solving some of the educational problems of their own countries. In fact, it is good practice for educational planners and architects to be in constant search for the best practices in facility design and explore ways of adapting or incorporating them into their own approaches to school building design as the need arises.

Developments in the use of instructional media also have their effects on the appearance and structure of school buildings. The use of radio and television presentations for instructional purposes requires spaces for small and large groups as well as for individual learning. Some new instructional materials may require special rooms with special visual and acoustic environments for correct usage. They may also require special spaces or facilities and conditions for storage. All these have their impact on the internal structures of the buildings.

SELF-ASSESSMENT EXERCISE

Explain how any three of these factors can affect the appearance and internal structures of school buildings:

i. economic factors
ii. cultural values
iii. educational programme
iv. increasing school enrolment
v. developments in the building industry.

4.0 CONCLUSION

Changes in the economic and social life of communities often result in changes in the appearance and structure of their school plants. Some other factors that can influence the aesthetic beauty of school buildings and other structures are the developments in the building materials and the design industries. Developments in instructional technology may lead to changes in the internal structures of schools for their usage and storage.

5.0 SUMMARY

In this unit, you learnt about how economic and social factors, the educational programme run by a school, school enrolment, a society's cultural values, the developments in the building materials and design industries can affect the design and character of school plants.

6.0 TUTOR-MARKED ASSIGNMENT

1. Discuss the possible effect of: (i) the introduction of new subjects in a school's curriculum, and (ii) the availability of affordable new building materials in the market on the character of the school plant.
2. The educational programme of a school affects the size of the school plant and the internal structures of the school buildings. Discuss.

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UNIT 4 THE NIGERIAN EXPERIENCE AND THE CHALLENGES

CONTENTS

1.0 INTRODUCTION

The units studied above have shown that the school plant is very necessary in the education process. In order to function effectively, the school plant must be given adequate attention by school administrators and school heads. In this unit, we shall review the provision and management of school plants in Nigeria and derive some challenges for the practice of school plant management.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- identify some problems associated with school plant management during the colonial era in Nigeria
- compare the problems of school plant management in the colonial era and those of the present times
- suggest ways of improving the practice of school plant management in the country.

3.0 MAIN CONTENT

3.1 School Plant Management in Nigeria

For our present purpose, we shall examine the practice of school plant management from two perspectives – during the colonial era when the provision of education in the country was largely in the hands of Christian missionaries, especially in the southern part of the country, and the post colonial or present period.

3.1.1 The Colonial Period

A review of the scanty literature on school plant management in Nigeria during the colonial era shows that there was inadequate provision of classrooms and school buildings for teaching and learning. This under-provision of learning facilities was attributable to the fact that formal education was being provided mainly by the Christian missionaries who received little or no financial assistance from their home governments.

With the little financial assistance they received from their friends and home churches they could not provide enough buildings to accommodate their pupils and teachers. Consequently, church buildings, tree shades and some private homes were also used for teaching and learning purposes.

The interest of the colonial government was manifested in 1872 with the provision of some grants-in-aid of thirty pounds to each of the major missions that met certain criteria in educational provision. The grants were mainly used for erecting school buildings. Before that year, there was no coordination of the efforts of the missionary bodies in regard to educational provision, nor did the colonial government exercise any control over education. Government supervision and control of education started in 1882 with the passage of the Education Ordinance covering the whole of British West Africa. This code provided for the establishment of an inspectorate to serve their four colonies. With the increase of the grants-in-aid to the qualified missions and the inspection of schools by the colonial government, there was a general improvement in the standards of school facilities and sanitary conditions in primary schools (Adesina, 1981).

During the depression of the 1930s government grants-in-aid was stopped. No new school buildings were constructed and the existing ones were overcrowded. This state of affairs continued until the late 1940's when the government was in a position to continue giving grants to qualified schools. In spite of the resumption of payment of grants to qualified schools there was still acute shortage of school buildings and classrooms in the early 1950s. The problem of acute shortage of school buildings and classrooms characterised the introduction of Universal Primary Education in the then Eastern and Western regions shortly before Nigeria attained independence in 1960. This was in spite of the extra efforts made by the two regional governments to expand their school facilities in anticipation of increases in primary school enrolments.

In sum, this period was marked by poor provision of school facilities especially for primary education in mission schools. School buildings served the primary purpose of providing shelter for pupils and their

teachers, not necessarily to accommodate the educational programme. There was no recorded case of any sum of money being budgeted for maintenance of school buildings either by the missions or the government. There was virtually no involvement of school staff or members of the local community in planning and designing new schools or the extension of the existing ones.

3.1.2 Post-Independence Period

After the attainment of independence in 1960, the then regional governments made concerted efforts to expand their educational facilities. These efforts were, however, generally short of meeting the demand for adequate learning spaces in both mission and government-owned primary and secondary schools. The situation became worse in especially the eastern states of the country following the end of the Nigerian Civil War in 1970 and the destruction of many school buildings during the war. The end of the war marked the beginning of the take-over of mission and other privately owned schools by the then existing state governments, all in a bid to exercise greater control over education in their states.

More pressure was exerted on school facilities following the launching of the Universal Primary Education (UPE) throughout the country in 1976. There was, again, a shortage of classrooms in the primary schools as was the case with the launching of a similar scheme in the then Western and Eastern regions. This was due to an underestimation of the number of prospective school enrolment. Nwagwu (1978) observed that the provision of school facilities in the country had always been inadequate. The federal government, in its Second and Third National Development Plans, noted the inadequacy of school facilities and its impact on educational quality in the country. Consequently, it made provision for expanding and improving the existing school facilities in its Third National Development Plan. In recent times, the same government has continued earmark some amount of money for renovation of facilities (Ehiametalor, 2001).

Efforts of the federal and state governments in the country seem not to have gone far enough toward providing adequate school facilities in the country as a recent observation of the Education Sector Support Programme in Nigeria (ESSPIN) shows in respect of some of the states that were studied by members of the group. According to ESSPIN (2009: 5) “It is estimated that 75 per cent of the school infrastructure in the project states is in very poor condition. In some states, particularly in the rural schools, the situation is worse than this.” On the condition of existing school buildings and some school plant management practices in some of the project states, the ESSPIN (2009: 6) reported as follows:

> Most of the school buildings are in poor condition. One of the main reasons for the current chronic situation is that the Education 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, a lack of supervision during construction… even where buildings have been constructed to an acceptable standard (generally those more than 20 years old) there has been a severe lack of maintenance which has resulted in many buildings being in a state disrepair and thus having a reduced life span.

There is no reason to believe that these observations are peculiar to the project states alone. They are also applicable to most other states in the country. Ogonor and Sanni (2001), for instance, have reported in regard to the states in Mid-Western Nigeria that, "there has been a tremendous growth in pupil population without a corresponding growth in the number of schools and facilities and that it would appear that school facilities had been allowed to decay."

The general picture presented by the conditions of school plants in Nigeria is that of inadequacy in terms of number and quality. The procedures adopted in planning and designing them have not been made explicit in literature, neither has there been active participation of teachers, school heads and community citizens in planning and designing the schools. The general trend seems to be that the educational architect in a state or federal Ministry of Education produces prototype working drawings of school buildings, based probably on experience, which are used for setting up the same type of buildings on different sites in different localities. Other relevant officials of the Ministry of Education get involved in the process mainly during site meetings with the architect, engineer and building contractors shortly before the construction work commences and as it proceeds. Once the building project has been completed, inspected by the Ministry of Works and taken over by the Ministry of Education, everything about its maintenance is usually forgotten.

SELF-ASSESSMENT EXERCISE

Compare the conditions of school facilities during the pre and post-independence periods.

3.2 School Plant Needs and Challenges

In spite of all the efforts made by the early Christian missions, the former regional governments and the various state and federal governments of Nigeria, the shortage of classrooms and school buildings continues to be a major problem confronting the educational system of the country. One of the major problems leading to this state of affairs is the dwindling financial allocations to the education sector. The money specifically voted for capital projects in education by different state and federal governments are not enough to meet the demand for new school plants and the expansion of the existing ones. The consequence of this is the overcrowding of available classrooms in our primary and secondary schools. The ugly situation is further exacerbated by the steadily increasing rate of population growth in the country leading to increasing number of pupils of school age and the increasing pressure on the school system.

The need for more school plants also arises because of the prevailing attitude to school plant maintenance among educational administrators, school heads and school staff. As already stated above, there are usually no provisions for school maintenance in state and federal annual budgets for education. Rather, it is usual to occasionally hear of allocations for rehabilitating school buildings and classrooms. This type of allocation is usually made when it is obvious that many school buildings are in a dilapidated or unusable state. Lack of regular maintenance services by the Ministry of Education and lack of necessary care by school staff and pupils contribute in no small measure to the rapid deterioration of the buildings. Other common problems which lead to poor conditions of some school buildings have been identified by ESSPIN (2009) as follow:

- Inadequate foundations that soon result in cracked walls.
- Very poor floor slabs and consequently weak and damaged screeds.
- Poor quality timber roof trusses (not seasoned and not termite treated).
- Poor quality sandcrete blocks in the walls with many having holes.
- Roof sheets of inadequate gauge and poorly fixed.
- Poor quality timber ceilings.
- Poor quality window and door frames and shutters.
- Poor quality furniture.
- Poor, and often, no maintenance (p. 8).

These and other problems tend to render some of the buildings unusable from time to time and eventually reduce their life spans, thus, increasing the need for school buildings and classrooms.

In addition to the problems that contribute to the shortage of school buildings and classrooms, there is also the problem of lack of records or reliable statistics to help determine the extent of the need for school plants. As Ehiametalor (2001) rightly observes:

> It is certainly not an overstatement or an exaggeration to state that very little information exists about school facilities in Nigeria. At federal, state and local government levels, there were no records on school plants.

There may be some statistical records on the number of schools, number of teachers and students or pupils by age, sex and the like in the state and federal Ministries of Education and even in individual schools but there are usually no records or statistics on the number and status of different school facilities in the ministry to help determine the extent of the need for different school facilities.

The present state of school plants and present practices in school plant management poses a number of challenges for federal and state governments, educational administrators, school heads, school staff and other stake holders in education. Meeting the school facility needs of schools throughout the federation in quantitative and qualitative terms is a real challenge to state and federal governments and educational administrators. Addressing the quantitative needs is essential for reducing the classroom sizes in most primary and secondary schools in states. In some states, it is common to find secondary school classrooms meant for 30 or 35 students being occupied by 80 or more students. Meaningful learning can hardly take place in such overcrowded classrooms. Providing sufficient shelter for pupils and teachers is one aspect of the problem. The other and perhaps the more important aspect is to make the buildings and the classrooms accommodate the educational programme. Some modern approaches to teaching require the use of new equipment in appropriately designed learning spaces and often specialised storage facilities. The challenge, in short, is to provide school plants in which form is dictated by function and which, at the same time, provide sufficient and comfortable accommodation for school children and staff.

School plants provide efficient services, if properly maintained and operated. It behooves school administrators and heads to ensure that school plants are regularly and adequately maintained. School plants are very expensive to construct and regular maintenance is necessary not

only to protect the public investment in them but also to extend their life spans. Well maintained schools are bound to attract and hold their students and in addition, communicate neatness and good sanitation to children.

Among the challenges to school administrators is the building of the capacity of school heads and staff in the areas of school plant planning, design and construction. Being the end users of the facility, school heads and staff need to know the activities and procedures involved in school plant development and need to be involved in the decision making processes especially in the area of educational specifications. Presently, as has been observed by ESSPIN (2009: 9), "…there is very limited involvement of communities in the planning, implementation and maintenance of school buildings." There is the need to involve the members of communities in such activities as the school plant also belongs to them and is important to them in many ways as we have already noted.

Adopting or embracing good practices in school plant development is one of the most important challenges to educational administrators and other stake holders in education. This involves making use of relevant professionals at the right times and at the right stages of the decision making process. It entails involving the end users and local community members in decision making and in some relevant activities, and following the procedures that have been seen to yield good results. It is by so doing that the highest value for money invested in school plant development can be realised and the school plant made to truly serve or accommodate the educational programme. Good practices and procedures that have very good chances of resulting in the development of functional school plants at reasonable costs form the subject of the remaining units in this course.

SELF-ASSESSMENT EXERCISE

i. Explain why it has not been possible for state and federal governments to meet the need for school plants in the country.
ii. Suggest some ways of meeting these needs.

4.0 CONCLUSION

The development of adequate and functional school plant has been one of the major problems confronting formal education since its inception in the country. This is mainly because of lack of adequate financial resources. Poor or lack of maintenance of the available ones is another problem which often leads to early deterioration of the facilities.

The major challenges to state and federal governments and other stake holders in education include increased funding, regular and adequate management of available school facilities, and adhering to good practices and procedures in school plant development. It also entails making use of professionals in decision making and implementation of decisions at the different stages of school plant planning, design and construction. Employing staff to take care of the school buildings will also help to extend the life spans of the buildings.

5.0 SUMMARY

In this unit, we learnt about the Nigerian experience in school plant management during the colonial period and thereafter. We also learnt why the needs for school plants continue to exist despite the efforts of the state and federal governments at providing them. Finally, we had an insight into some of the challenges of effective school plant management in Nigeria.

6.0 TUTOR-MARKED ASSIGNMENT

Discuss the major challenges of school plant management in any named state in the country and suggest some effective ways of meeting them.

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MODULE 2 SCHOOL PLANT PLANNING

UNIT 1 BASIC CONSIDERATIONS IN PLANNING

CONTENTS

1.0 INTRODUCTION

Possibly with a few exceptions, most school plants in the country were constructed for school administrators and teachers to use in running the educational programme. It was the duty of teachers and administrators to make the programmme fit the buildings. The present emphasis in school plant development is no longer on any type of building to run any type of programme but on functional buildings specifically designed to accommodate the educational programme.

In this unit, you will learn about some essential conditions for effective school plant planning and why long-range planning is essential in school plant development. You will also learn about who should take part in the planning exercise, their roles and some guidelines or principles that they may find useful in school plant planning.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- state the essential conditions for effective school plant planning
- explain why long-range planning is important in school plant development
- highlight the roles of different professionals and groups involved in school planning

- state the prerequisites for success in planning
- discuss the significance of at least five principles of school plant planning.

3.0 MAIN CONTENT

3.1 Prerequisites for Effective School Plant Planning

Planning a functional school plant is a complex task. It involves putting up functional buildings and other structures that will be adequate for present and future use and also provide a conducive setting for effective teaching and learning. It requires considering a number of political, social, economic and other environmental factors that are related to the educational programme, the school plant and students' behaviour. There are a number of conditions and procedures that are crucial for the success or otherwise of such a project. They include but are not, necessarily, limited to the following:

Effective leadership

Successful planning and execution of any programme or project depends on effective leadership. As regards a school plant, an effective leader should, in addition to good leadership qualities, have a good knowledge of the academic programme, psychology of learning and the impact of school facilities on student behaviour. The leader should be able to create an atmosphere where people will be free to put forward their own views and work to the best of their abilities. Effective leadership demands that the leader be capable of identifying some professionals and lay citizens who have good knowledge of the education programme, the goals of education and basic aspects of school infrastructure. It requires that the leader should be able to know the people working with him/her, the skills and competences that they have and assign the right tasks or roles to the right people.

The leader of a team saddled with the responsibility of planning a school plant should not only know the vision and mission of the school system but should also be able to make them explicit to his team members so that each of them will be able to see how his efforts will contribute towards actualising them. In order to achieve success in the assignment, the leader should be current with good practices and new developments in school plant planning.

Nature of educational goals

School plants are set up for the accomplishment of some long-term goals. They are costly investments in education and are expected to last

for 50 years or more. There is the need, therefore to adopt a strategic or long–term planning approach when taking decisions on the present and future functions and form of the school buildings and other structures. Long term planning involves taking a long term view of what the school enrolment will be in about ten to twenty years time or more, the changes that are likely to take place in the school programme because of the social, political, economic and technological changes envisaged in the foreseeable future. This is necessary in order to have good value for the financial investment in the school plant and to prevent obsolescence of the buildings within a few years after completion.

Failure to produce a physical plant that will service the educational programme for a long time, leads to some undesirable consequences. It may present some difficulties to teachers in implementing some aspects of the educational programme thereby depriving children of some learning opportunities. It may necessitate immediate remodeling of some buildings or parts of some buildings or expanding them in order to take care of some new developments in the curriculum. It may call for changes in the methods of teaching which were not foreseen because the planners of the structures did not look far enough into the future. This implies an avoidable loss of money, and materials that were invested in the buildings and structures in need of modification as well as an increase in the cost of construction.

Team approach

There is hardly any individual with all the knowledge, experience or competence to plan a school plant with all its desirable features and qualities. In planning to meet the essential requirements for a functional and attractive physical plant, groups and individuals with relevant interests, abilities and experiences, have to work together, as a team, with each person contributing to discussions in relevant areas of competence. The team or group should, therefore, be made up of professionals in the design and construction industry as well as facility planners, educational planners, members of the Board or Ministry of Education, school principals and teachers, educational consultants and community or lay citizens.

As has been earlier pointed out, it is important that the principal and some teachers for the prospective school or in the school where modification of the school plant is to take place should participate in the planning process because they will be the end users of the product. There is no set ideal number of people that should make up a team for school plant planning. Any number will suffice as long as each member has something special to contribute. This is not to suggest that the number should be unwieldy. For purposes of effectiveness, the group

members should be broken up into a number of committees to perform different special functions or roles depending on the interests and competences of the members of each committee.

Proposals on how to meet the physical plant needs of different subject areas, for instance, should be made by committees made up of members with adequate knowledge in those subject areas. Some of the teachers and principal, lay citizens, and supervisors of schools could be assigned the responsibility of reviewing and updating the educational philosophy, goals and objectives, while the architect, facility planner and educational consultant deliberate on the latest developments in educational facilities planning. The objectives to be accomplished by each committee should be clearly known to the members.

Some of the tasks to be performed by some committees will entail conducting some studies or collecting and analysing data on different aspects of community life, the educational programme and school environments. A deadline should be set for submitting the reports and recommendations of each committee, after being given enough time to carry out their assignments.

Effective communication

Effective communication is one of the basic requirements for success in planning. Members of each committees or study group should not only be clearly informed about their tasks and responsibilities, they should also be made to know how their contribution fits into the general scheme of things. Easy flow of information between members of a team and between one team and another should be ensured.

Whoever is the leader of the whole planning effort should be in constant communication with each team, ensuring that work is going on as expected and helping to find solutions to any problem encountered or identified by each team. In attempting to solve some of the problems, the leader may have to seek the assistance of relevant resource persons or experts. Being able to get experts to resolve problems encountered by some teams is one of the ways of ensuring the success of the planning effort. Success is further enhanced by effective coordination of efforts which is, in turn, enhanced by effective communication.

SELF-ASSESSMENT EXERCISE

i. Why is long-range planning essential in school plant development?

ii. List and describe three important conditions for the successful planning of a school plant.

3.2 Principles of School Plant Planning

Planning a new school plant or modifying an existing one may be a new experience for some of the people involved in the exercise. Many decisions have to be made right from the time that the idea of embarking on school plant development or modifying an existing one is conceived. In taking some of these decisions or in seeking solutions to some problems of school plant planning and design, the planning team may have to rely on some principles that that have been found over time to result in successful projects.

Principle: meaning and significance

A principle is a basic or widely accepted rule, norm, doctrine, or assumed truth that guides or influences thought, decision, or action on a matter. Some principles of school plant planning have been derived from various sources-practical experiences of practitioners, logic, theories, observations and research studies by environmental psychologists and educators. As in other disciplines and areas of human endeavour, these principles make it possible for the members of a team to channel their efforts towards the same direction. It also enables them to manage change with less effort. It is important to note, however, that principles are just guidelines to possible action and not rules that must be obeyed under all circumstances. They are not absolutes even though they may apply predictably under normal circumstances.

Versions of principles

There are as many sets or versions of principles of school plant development as there are authors. Some of the authors have formulated principles that span the whole process of school plant development from the planning stage to occupancy, maintenance and operation. Some have written only on the planning aspect, while some have developed some principles that are applicable to specific educational institutions. There is, therefore, no agreement among them in regard to number or statement of principles. All the sets of principles have one purpose – to contribute to the body of knowledge on the setting up of attractive school plants having conducive learning environment and meeting the needs of the academic programme, the school children, staff and members of the local community.

Lackney (2003) for instance, lists and explains 33 principles of what he refers to as educational design which he classified into five groups -

educational facility planning and design process principles; principles for shared school and community facilities; community spaces principles; and principles for site design and outdoor learning spaces. Bookwalter (1964) developed a set of eleven general principles for the planning, construction and utilisation of school facilities. They are the principles of validity, utility, accessibility, isolation, departmentalisation; safety, hygiene, and sanitation. Others are supervision, durability and maintenance, beauty, flexibility and expansibility, and economy.

Other writers have developed their own sets of different numbers of principles. Most of these principles are subsumed under the set of six principles developed in 1998 by a group of stakeholders in education who were invited by the United States Department of Education to discuss ways of planning and designing schools to best meet the needs of their students and communities. The principles were later endorsed by the American Institute of Architects, the American Association of School Administrators, the Council of Educational Facility Planners, International, and the Construction Managers Association of America. The principles are listed and discussed hereunder.

The Six design principles

According to the above-mentioned stakeholders, in order to meet the nation's needs for the 21st Century, school learning environments should: (1) enhance teaching and learning and accommodate the needs of all learners; (2) serve as a centre of the community; (3) result from a planning and design process that involves all community interests; (4) provide for health, safety, and security; (5) make effective use of available resources; and (6) be flexible and adaptable.

Principle 1: The learning environment should enhance teaching and learning and accommodate the needs of all learners

Like many of the others, this principle is based on research evidence that show that school design can either enhance or hinder academic achievement. It is based on current research and practice that call for a departure from old rigid school designs with all their restrictions on pupil and teacher activities to modern ones that emphasise new education models characterised by active student participation. Modern approaches require that students move about, work in groups of various sizes and be active in class. They also recognise the use of different learning styles and the special needs of each student. Some of the learning needs of children recognised by research include indoor air quality, occupant comfort, lighting, and acoustics.

Principle 2: The learning environment should serve as a centre of the community

The rationale of this principle is that successful schools strengthen a community's sense of identity and coherence and that a school that serves as a community hub teaches its occupants about cooperation and common good. Unlike in the past when schools were seemingly isolated from the community, this principle stresses that schools of tomorrow must be designed to be more open and serve a variety of community needs and encourage the involvement of the community members in school activities.

Principle 3: The learning environment should result from a planning and design process that involves all community interests

This principle is based on the democratic tenet which holds that people have a right to participate in making decisions that affect them and that such participation improves the outcome of the decision making process. This implies that schools should be planned by many members of the community who will use them – educators, parents, students, and members of the civic and business organisations.

The rationale here is that community participation in the planning process creates a sense of shared purpose, increases their commitment to the school, and makes them see themselves as visionaries, creators, and owners. Such feelings and mindsets make them more willing to work together to set goals, solve problems, and provide their schools with ongoing support and financing necessary to make the schools succeed.

Principle 4: The learning environment should provide for health, safety, and security

This principle is emphasised by other writers on guidelines to school facility planning and design. In addition to the traditional concern for the safety and health of children, emphasis on this principle is buttressed by rising youth violence, crime drug, abuse and terrorism, especially in the American society. In order to ensure high safety and health standards, schools should not only adhere to the building codes but should also incorporate the three concepts of natural surveillance, natural access, and territoriality in their designs. Safety and security can be enhanced by strategically locating windows, entry access, and gathering places. Territoriality can be secured by using hedges and fences.

Principle 5: The learning environment should make effective use of available resources

This principle requires that schools have to be designed to take advantage of the fact that the physical environment can have a positive effect on learning experience. One effective way of doing this is to make use of the available resources. To enable students understand the connection between the classroom and the workplace, for instance, schools can make use of outside resources like the community library, parks, hospitals and other public buildings for extended learning.

Principle 6: The learning environment should be flexible and adaptable

This principle is based on the fact that constant change is a fact of life. School facilities should therefore be designed to accommodate change. Changes in the needs of the community necessitate changes in the educational programme and delivery methods. Some of these changes can be accommodated by designing the school for spatial flexibility. This implies making provision for large rooms that can be used for anything or that can be easily repartitioned. The same end is accomplished by making use of flexible, open structural systems that can be reconfigured as the need arises. Flexibility and adaptability are enhanced by reviewing the master plan and educational specifications at least once every five years.

SELF-ASSESSMENT EXERCISE

i. Why are design principles important in school plant development?
ii. In what other ways can school plants be made safe and secure for students?

4.0 CONCLUSION

A team approach to long term or strategic planning of school facilities under a committed and competent leadership is necessary for planning and designing a functional school plant that will meet both the programme and students' needs. Applying many of the principles for school planning and design will not only help to meet these needs but may also secure many advantages for educators, the users of the school plant, and the members of the local community.

5.0 SUMMARY

In this unit, you learnt about the conditions necessary for long range planning which is often required in school plant planning. They include

effective leadership, team approach and effective communication. You also learnt about some principles which can guide planners and designers of school facilities in doing their work. Finally, you learnt about a set of six principles and their significance in school plant planning and design.

6.0 TUTOR-MARKED ASSIGNMENT

Discuss the significance of any two principles of school planning and design in the creation of a suitable learning environment.

7.0 REFERENCES/FURTHER READING

Bookwalter, K.W. (1964). *Physical Education in Secondary Schools*. Washington, D.C.: The Centre for Applied Research in Education.

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UNIT 2 DETERMINING EDUCATIONAL NEEDS

CONTENTS

1.0 INTRODUCTION

In the last unit, we pointed out the need for a team approach to school plant planning. Note that we suggested that the planning team has to be broken up into study groups. In this unit, our focus will be on the studies to be conducted by these groups. Before a new school plant is built or before an existing one is expanded, a need for it must have been established. You will learn in this unit, some of the determinants of these needs which the study groups should address.

2.0 OBJECTIVES

At the end of this unit you should be able to:

- state the major studies involved in the planning of school plants
- discuss the usefulness of such studies
- describe the major approaches to school enrolment forecasting
- project school enrolments from given data
- describe the major tasks involved in evaluating a school's exiting facilities.

3.0 MAIN CONTENT

3.1 Community Survey

An educational programme reflects a community's philosophy of education, and its goals and objectives- the actualisation of which is to be supported by the school plant. It is therefore, necessary to have a

working knowledge of the community and its growth and development. Apart from this, it should be noted that a school is part of the general development efforts in the community. Its location or extension, remodeling or renovation is, therefore, to be in tandem with the general pattern of land use and proposed development projects in the community. For instance, it is essential to find out whether and where new roads markets, hospitals and clinics etc., are to be built in order to plan appropriately for the site and the design of a new school building or an extension of an old one.

It is important to involve the citizens of the community in the group to undertake this aspect of the study; also it is crucial to work closely with the community leaders and town planning agencies in the communities where they exist. Gathering information on the future development pattern of the community is essential for site selection and acquisition. Interaction with the community members will reveal their philosophy of education, the educational aspirations for their children and their expectations from their schools.

The ages, types of residential buildings and the trend in the development of new houses may give insight into future pattern of population distribution in the community. Other variables that might influence the demand for education in the community and which need to be investigated during the survey are the population, the age distribution of the members, their educational attainment levels, their occupational patterns, and their general attitudes towards education of boys and girls, among others.

SELF-ASSESSMENT EXERCISE

Explain the influence of any of the three factors mentioned above on school enrolment.

3.2 Population and School Enrolment Study

A school is built to serve certain people in the community or a number of communities as the case may be especially with respect to post-primary institutions. It is therefore necessary to identify the catchment area of the proposed school or the existing one and obtain relevant demographic information about it. Census data, where available, will be very useful in this regard. Among the important information that need to be gathered during the survey are: the present size of the population and its distribution, the rate of population growth, current enrolments in public and private schools (if any) and the holding power of the public schools.

In urban areas in particular, it is necessary to also study the rate of movement of people from the surrounding areas as well as the enrolment of non-residents in public schools. In both types of localities it is necessary to conduct a school census which, in order to serve a useful purpose, should be updated from time to time.

3.2.1 Projecting School Enrolments

Apart from obtaining data on current school enrolments, it is necessary to have an idea of what the future enrolment will be like. Some of the common methods of estimating school enrolments include:

(i) Analysis of past census data

A number of past census data collected in the past census years is examined and the school enrolment trends in the past are projected into the future. A major limitation in the use of this approach is that it is assumed that there will be no changes in the factors affecting school enrolments in future.

(ii) Relating school enrolment to the total population

This involves projecting the total population of the community or catchment area by any reliable method and assuming that a certain percentage or fraction of the projected figure will be of school-going age in a target year. For instance, it may be assumed that one-sixth of the total population in a particular target year will be of school-going age. This assumed ratio of school-going- age population to total population depends, however, on the observed trends in the past and on the possible factors that will influence population increase. In all, the reliability of this approach depends on the reliability of the population projections.

(iii) Analogy

This method is based in the assumption that if two communities or areas are similar in regard to population growth, school enrolment, school retention trends, and some other environmental characteristics, then what happens in one will also happen in the other. This implies that if two communities are similar in environmental characteristics, the school enrolment size in one of them in a target year can be assumed to the same in the other community in that particular year. The flaw in this approach is that it is difficult to find two communities that are exactly similar.

(iv) Average survival-ratio method

This approach to projecting school enrolment (also known as Cohort-Survival Ratio) is partly based on the analysis of past census data technique but modified in the light of any new development in the rate of birth in the community. In this approach, all other factors affecting school enrolment are lumped together, while birth rate is considered separately.

The method assumes that the rate of progression from one class to the next (and also the number of births to the number of pupils in year one of the elementary school six years later) will be consistent with the rates of progression in the previous years. The main assumption when using this technique is that past enrolment trends will continue into the future (Caffarella, 1983). When using this method, the birth rate in a given year is compared with the enrolment in year one of public primary schools in the community six years later, i.e. when they are expected to enter the primary school. The obtained number of pupils in year one is then compared with the number in year two a year later, i.e. when they are supposed to be in year two.

If, for instance, they were 100 in year one in 2002 and 98 in 2003 when they were in year two, the survival ratio is 0.98 or a survival rate of 98 percent. Fluctuations in this ratio or rate are observed from year to year and an average is calculated which can be used to project enrolments. For example, if the average survival ratio for progression from class one to class two is 0.98 and 100 pupils are now enrolled in class one, by this method, it is expected that there will be 98 pupils in class two next year.

Based on the available birth data for the groups of children that are assumed will be entering public schools in the next five or six years, the first year enrolments are projected by applying the average survival ratio obtained from an analysis of the number of live births and past enrolment data. The survival ratios from one class to the next can be calculated for a number of years and the averages used to predict enrolments from one class to the next.

Although this method is very simple to use and is, in fact, more widely used than other methods, it should be noted that it is only good for short-term projections and may not be suitable for use in fast growing communities. Its value depends on the appropriateness of the time it is used to project enrolments. In communities where major demographic changes have taken place, calculating the averages for short time periods is appropriate while longer time averages may be appropriate for communities with fairly stable demographic factors.

SELF-ASSESSMENT EXERCISE

Describe, in detail, any two methods of projecting school enrolments that you know.

3.3 Evaluation of the Present Programme

One very important study to be conducted at this stage is the evaluation of the current school programme. It is of utmost importance to review the school's aims and objectives, the curriculum content and the methods of teaching and learning in order to find out the extent to which they meet students' needs.

It is necessary to evaluate the aims and specific objectives in each subject area and determine their relevance or otherwise to the present and future developmental needs of students. The participation of community citizens in evaluating the aims and objectives of their schools and, if possible, starting new ones is particularly useful in this respect.

The content of the curriculum should be examined in the light of desirable changes in the aims and objectives of the school. Following the study, there may be need for some changes in the curriculum content or the methods of delivery. There may be desirable changes in the time allocation to different subjects. The methods of teaching different subjects need to be studied. Data need to be gathered on the availability, adequacy or otherwise of modern facilities for teaching, laboratories, audio-visuals, display spaces etc. These are important for estimating the facility and equipment needs of schools. In addition to data on the curricular offerings, teaching methods and equipment, there is the need for data to be collected on how schools organise for instruction, how objectives and missions of the school are evaluated as well as on the support services for the educational programme.

3.4 Evaluation of Existing Facilities

This type of study is relevant to existing schools in which some of the buildings need to be modified or replaced, but the findings are also useful for the needs of new ones under consideration. An evaluation study of existing school facilities is useful in determining the extent to which they meet the programme and community needs and in finding out what modifications or additions are required to meet these needs.

School buildings should be evaluated with regard to their suitability for use or otherwise with regard to safety and health and for implementing current and future educational programmes. The conditions of the floors,

ceilings, foundations, electrical, plumbing and ventilation systems need to be studied. This aspect of the study needs the active participation of architects, engineers as well as educators and community citizens.

The existing facilities also need to be evaluated in relation to the educational programme. The availability, utilisation, and adequacy of space for different kinds of teaching and learning activities as well as for community use for educational and other purposes should be included in the study.

SELF-ASSESSMENT EXERCISE

List two aspects of an educational programme and two aspects of existing school facilities that should be studied in order to determine educational needs during a school plant planning, stating the reasons why it is important to study each of them.

4.0 CONCLUSION

Determining educational needs is a crucial step in the process of designing and planning new school plants or modifying existing ones. This step determines to a large extent, the suitability or otherwise of the end product for the educational programme. The effectiveness of the different study groups in carrying out their assignments is, in turn, determined by the effectiveness of the leadership offered to each group and the overall planning effort.

5.0 SUMMARY

In this unit, you learnt about the need for long-range planning in the development of new school plants and in the modification of existing ones. It has been pointed out to you that in order to ensure success in planning the school plant, there must be effective leadership, as well as well coordinated team effort supported by effective communication. We also learnt the different kinds of studies to be conducted in order to identify the needs to be met in the school buildings or the modification being proposed.

6.0 TUTOR-MARKED ASSIGNMENT

Why are the following activities necessary in school plant planning and design?

1. Long-range planning
2. School enrolment projection

3. Evaluation of existing school facilities.

7.0 REFERENCES/FURTHER READING

Caffarella, E. P. (1983). "Determining the Accuracy of Enrollment Projection for School Districts." *CEFP Journal*, 21 (4), 14-16.

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UNIT 3 EDUCATIONAL SPECIFICATIONS

CONTENTS

1.0 INTRODUCTION

The study phase of school plant planning will end up with recommendations on the number and types of instructional and non-instructional spaces and other facilities needed to house and implement the educational programme. As educators cannot design the facilities by themselves, they need to communicate what they require of a school plant that will house their educational programme in order to ensure effective teaching and learning. They do this by developing a document referred to as either educational specifications or programme requirements. Writing educational specifications is also a very important activity in educational planning because many of the shortcomings of completed facilities can be traced to shortcomings of the educational specifications.

In this unit, you will learn about educational specifications. We shall first address the meaning and purpose of educational specifications. Following this, we shall discuss how to organise for the task and finally describe its contents and characteristics.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the meaning of educational specifications
- explain why educational specifications are important in school plant planning

- describe a suitable procedure for developing educational specifications
- state the characteristics of educational specifications
- evaluate any given educational specifications for a given educational programme.

3.0 MAIN CONTENT

3.1 Meaning and Purpose of Educational Specifications

The term 'educational specifications', also known as programme requirements, are the means by which educators communicate to the design professionals the specific ways they see a proposed educational facility supporting and enhancing the implementation of an educational programme. The success of the educational specification in clearly communicating the requirements of the educational programme to the professional designer determines to a considerable extent, the overall success of the building programme.

Educational specifications are neither precise statements of the instructional programme nor are they prescriptions of what is to be done by the design professionals. The document provides the rationale on which the architect will base the design of the facility. The design professional needs the information contained in the document before developing the architectural solution to educational problems. According to the Council of Educational Facility Planners (1969: 47), the emphasis in the term 'educational specifications' is on the term *educational*. Educational specifications, according to them:

> …are clearly separate from architectural specifications. To serve their primary role in shaping the design, organisation and formation of facilities, they must, first of all, describe the learning activities that will occur. In addition, they must describe, thoroughly and concisely, the number, grouping, and nature of the people involved; the spatial relations of facilities and site; the interrelationships of instructional programme with each other and with non-instructional activities; the major items of furniture and equipment to be used; and any special environmental provisions that would improve conditions for the learning situation as well as staff efficiency.

3.1.1 Purpose of Educational Specifications

The main purpose of developing educational specifications as hinted above is to serve as a means of communication between educators and architects. The document also serves some other important purposes. Some of these purposes as identified by the North Carolina State Board of Education (2002) are outlined below.

a. It serves as a means of shaping individual thought and reaching a consensus. Writing educational specifications affords the staff of a school an opportunity to collect and analyse relevant information about many factors and sharpen their thinking with regard to methods of teaching, utilisation of space furniture, equipment and other variables that are related to their work in the school. Writing educational specifications affords them the opportunity to study, read about or review these variables, discuss them together and arrive at a consensus before the document is forwarded to the design professionals.

b. It serves as a means of public relations. This means that it solicits the active participation of the members of the community as parents are actively involved in committees and subcommittees. Representatives of community agencies are also consulted in the process. The net effect of this is that the community members are more likely to be more supportive of the school than would be the case if they are not involved.

c. It serves as a means of continuous and final evaluation. This is because it provides a tangible statement against which the various stages of the design and construction process can be evaluated. It accomplishes this purpose through the continuous dialogue which should exist between the architect and the educators concerning the compatibility of the educational programme and the facility.

SELF-ASSESSMENT EXERCISE

i. Explain the term ‘educational specifications’ in your own words.
ii. Discuss two purposes served by educational specifications.

3.2 Organisation and Procedure

Here, we are going to start by asking the question-

Who should be involved?

A pertinent question in regard to the development of educational specifications is to ask who should be involved and how? If educational

specifications are to actually communicate to the design profession the nature of the activities that will take place in the proposed facility, and the equipment and materials needed for such activities, it becomes obvious that teachers, head teachers and school inspectors or supervisors who are responsible for implementing the educational programme must be involved. Their insights into, and experiences with the programme implementation and educational facilities will provide useful data to architects in designing functional facilities.

From the discussion above, it would also have become obvious that parents and various community representatives should be involved. Their participation is necessary because the school as a social institution should reflect the needs of the community. Parents and other community members can contribute in general ways but leave the description of the instructional programme to the school people.

Owing to the time-consuming nature of the task of developing educational specifications, and the rising cost of school construction, there is the need to involve the design and educational consultants – an architect and an educational planner. An architect needs to be involved in the task if one had not been engaged right from the start. He/she will act in the capacity as an observer and a consultant as well as an adviser on all architectural considerations. Another professional who needs to be involved is the educational consultant, whose training, knowledge and experiences in educational planning will be of immense help in organising the task and interpreting the final product to the design professions (Council of Educational Facility Planners, 1969).

Although students may not have been traditionally involved in those school systems where school development involves writing educational specifications and active involvement of many people in its preparation, it is good to involve them in their capacity as the clients of the school and one group of end users of the completed product. They also constitute the group that is most affected by school facilities. Students' involvement helps to convey the feelings of the student population in regard to some desirable and undesirable features of the school facility that may be overlooked by adults.

There is also the need to involve some auxiliary services personnel who maintain and operate various support systems of the school where such personnel are employed on full time basis. The experiences of such personnel will be found very useful by the architect not only in the recommendation of materials to be used but also in the general design of the facility.

3.2.1 Procedure

From the preceding discussion, it is obvious that a team approach to the task is desirable. An educator, who ideally would have been leading the planning effort right from the beginning, must serve as the leader of the committee developing the educational specifications. It is suggested that the leader should set up a sub-committee in which members of the Ministry or Board of Education, supervisors or inspectors and the instructional staff are represented. This sub-committee should be as small as possible. This sub-committee should be charged with the responsibility for organising a number of relevant working committees who may have to deliberate over some issues which may come up for discussion. It is also its duty to arrange for consultation with relevant experts who may not be members of the committee but whose services or advice may be required.

A problem-solving approach to the task is usually recommended. This involves considering the implications for physical facilities of every aspect of the educational programme and of all the methods which may be used. The task starts with a systematic description of the educational programme and drawing the implications for the kinds and amounts of spaces, space relationships, treatment of space, physical environmental factors, storage facilities, furniture and equipment (including the use of radios, televisions and other audio-visual media) and the service systems.

It is important that the planning committee be given adequate time to work. The time given the members for this task should be up to one year or more. The architect should also be allowed sufficient time to do his own design work after the educational specifications have been developed. There should, of course, be adequate budget for this phase of educational planning. There should be enough money to pay for the services of all the consultants and experts involved as well as for printing all the materials required for the work and also for defraying other incidental expenses.

SELF-ASSESSMENT EXERCISE

Justify the inclusion of the following in a team for developing educational specifications:

i. teachers
ii. the architect
iii. parents
iv. educational consultants.

3.3 Content and Format

When the committee completes its work, the next concern will be with the content of educational specifications. The findings and recommendations from the various studies conducted to determine educational needs and the recommendations of the team developing the educational specifications must be clearly communicated to the architect. All relevant policies by the Ministry of Education or Schools Board in regard to the educational programme and school plants must be made available to the architect. It is imperative that the document be organised and written for the architect in the language he/she can understand. It should always be borne in mind that the document is just a guide and not an instructional manual. In regard to the format and content of the document, the Council of Educational Facility Planners (CEFP, 1969) suggests that the write-up be organised into two major areas – general considerations and special considerations.

3.3.1 General Considerations

This section of the document contains general information. Among the information included here are the statement of the philosophy and objectives of the school. The statements should be free of any pedagogical terminology while the goals and objectives should be listed.

There should also be some information about the community such as the general level of educational attainment, the average family income, the population trends, the available community services, and the general attitude of the people that will have to be considered by the architect. The architect will also like to know whether any provision is to be made for community use of the school plant.

To be included in this area are information about the school system and its services, administrative organisation of the school system and any possible changes being anticipated, the school enrolment in the past few years and anticipated future enrolment, and the financial situation of the school. There should also be some information on the construction programme under consideration, such as the nature of future expansion anticipated, and the expected date of occupancy.

3.3.2 Special Considerations

It is suggested that information about space be grouped into three major areas: instructional use including all distinct subjects or levels of instruction; general use, including administrative, learning resources, library, guidance and other areas; and service use, including custodial, food service, transportation, and maintenance and storage facilities.

Each activity space, whether for general, instructional or service use should be treated and uniformly reported to reflect the following factors: objectives, activities to be housed, persons to be accommodated, space requirements, spatial relationships, equipment to be housed, and special environmental treatment. Each space should be treated in the order set out as shown below.

First: *what are the objectives*? There should be a simple, clear and concise statement of the philosophy and objectives of the programme to be housed in the space under consideration. The philosophical setting for a description of the activity that will take place in the space should be briefly stated.

Second: *what kinds of activities are to be housed*? The answer to this question is very important because the activities that will take place in the space will affect the design more than anything else. The description of the activities should be considered as an analysis of how pupils learn and the techniques used by the teacher to provide learning opportunities for the pupils.

Third: *who will be accommodated in the facilities*? This requires statement of the number of pupils, the number of teachers, and the optimum class size.

Fourth: *what are the space requirements*? This requires a statement of quantitative fact in terms of the types and numbers of rooms and the relative sizes of spaces needed. There should be no precise statement of the dimensions of the rooms or spaces needed. That aspect should be left to the architect.

Fifth: *what are the spatial relationships of the facility under consideration to other spaces*? The relationships of facilities for an instructional programme with other indoor and outdoor programmes should be stated.

Sixth: *what types and kinds of equipment affect the design of the space*? The furniture and equipment should be in tune with the educational activities. There should be no specification of the size, layout and the brand names of the furniture and equipment.

Seventh: *are there special provisions that are unique to the space under consideration?* This question requires a statement of any special environmental treatment, e.g. high illumination, reduced noise, required to improve the utility of the facility.

SELF-ASSESSMENT EXERCISE

Discuss any three factors that should be taken into consideration when providing information to the architect on the intended use of each activity space.

4.0 CONCLUSION

The development of educational specifications is a crucial aspect of the school building programme. Just as in many other types of planning activity, its success depends on effective leadership, team approach and participation by many stakeholders in education. Design professionals must be given sufficiently detailed information to enable them design the facilities as desired. Any shortcomings of the completed building project are most often traced to the shortcomings of the educational specifications. Considerable care should therefore be exercised in developing it.

5.0 SUMMARY

In this unit, you learnt the meaning of educational specification and the other purposes it serves apart from being a means of communication between educators and the design professionals. This is the area, in the educational planning process where the experiences and expertise of the educators count most. You also learnt about the format and the content of the educational specification document. Finally, you learnt about the seven factors that must be addressed when providing information to the architect on each activity space.

6.0 TUTOR-MARKED ASSIGNMENT

What are educational specifications? Discuss the important factors that must be considered when providing information to the design professionals on each activity space.

7.0 REFERENCES/FURTHER READING

Council of Educational Facility Planners (1969). *Guide for Planning Educational Facilities.* Columbus, Ohio: Council of Educational Facility Planners.

North Carolina State Board of Education (2002). "What are Educational Specifications?"Retrieved from *http://www.schoolclearinghouse.org*.

UNIT 4 SITE SELECTION

CONTENTS

1.0 INTRODUCTION

Selecting and acquiring suitable school sites are an important part of the school plant planning process. A school's site is one of the factors that can either enhance or hinder the implementation of its instructional and non-instructional programmes. The site is also one of the factors that can determine how useful a school plant can be to the members if the local community. School administrators should therefore be concerned with the present and future needs of their school sites.

In this unit, you will learn about the meaning of school site and why school administrators should be concerned with the school site. You will also learn about the process of site selection, the factors to be taken into consideration when selecting, and the activities involved in developing a school site.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- state the meaning of school site
- explain why school sites need to be reviewed regularly
- distinguish between general and specific factors affecting school sites
- discuss the factors influencing school site selection
- describe how to develop a school site.

3.0 MAIN CONTENT

3.1 Meaning and Importance of School Site

One of the most vital problems to address when the establishment of a new school, or the expansion of an existing one, is under consideration is that of securing an adequate site. The word 'site' is a very familiar one. It refers to the area or exact plot of land or ground on which anything or a structure or group of structures is, has been or is to be located. School site is just the piece of land or plot of ground on which a school plant is built or is to be built. It is on the site that school buildings are erected. It is on the site that foot paths and walk ways, car parks, and play grounds and all other structures that make up a school are constructed. It is important that wherever possible, the school site should be of adequate size to accommodate all the structures, services and activities required to conveniently implement an educational programme.

It is obvious that without a school site there will be no physical structure called school. The size, location and nature of the school site can facilitate or hinder the implementation of the school programme and affect the children's learning opportunities. If a school site is small, for instance, it may not be able to accommodate all the physical structures needed to implement the school programme effectively. It may not have play and recreational grounds. Attempts to overcome this problem may lead to high expenses on special design and construction of school buildings. Alternatively, it may lead to operating the school on two or more sites with the attendant coordination and transportation problems.

As Stewart (2006) points out, school site affects the importance the public holds of its schools. It also conditions how visitors and newcomers perceive the school. It is possible that it also affects how children in a school perceive it. The location of the site may also affect the children's attitude to school attendance and possibly the achievements of some of them at school.

It is important for school administrators and school heads to regularly monitor the site needs of their schools which may arise out of increase in student enrolment and the attendant need for new structures to accommodate them. Site needs are also indicated when new facilities are required to house modern instructional equipment and materials. The same is true when there is need to accommodate the educational programme and house the school staff and children as obsolete school buildings are destroyed to give way to new ones.

SELF-ASSESSMENT EXERCISE

i. Explain the meaning of school site.
ii. Why is school site important in education?

3.2 Selecting the Site for a School

Selecting an appropriate site for a school or for the extension of an existing school is an important consideration for school administrators and community citizens. In Nigeria, this is not usually an issue because, in many cases, the community where a new school is to be located, or where the exiting one needs to be expanded, readily donates a piece of land. In most of such cases the question of whether or not the donated piece of land has the qualities of a good school site usually does not receive adequate consideration. It is, however, doubtful whether many communities are ready to give up their pieces of land readily nowadays especially in urban centres, the present land use policy of the federal government notwithstanding There seems to be no doubt that as time goes on, school sites will be more difficult to acquire in the country.

Whether or not school sites are readily available in any country or community, there is always the need for long-range projection of school site needs. These projections should be regularly revised and updated. If such a revision reveals the need for the acquisition of another site or if the need for a new school arises, there are two basic questions that must be addressed: (1) who will be responsible for selecting the site? (2) What criteria will be used in selecting the site?

Responsibility for site selection

Selecting and developing a school site should be an organised and rational process that is based on adequate and accurate information about the school programme and the local community of the school under consideration. Good practice requires that site selection be done by a committee of competent people. The task requires the coordinated effort and special skills of a team made up of school administrators, teachers, community members, public officials, architects, engineers, landscape architects, town planners, and legal consultants. All these people and their leader should be reporting directly to a local educational administrator or to an official of the Ministry of Education appointed for the purpose.

Criteria for site selection

After the committee has been constituted, it will be good for the members to develop some criteria on which to base the selection of the

potential site. They should familiarise themselves with the nature of the educational programme for the site. They should note the types of outdoor learning experiences and recreational activities that will take place at the potential site. Note should also be taken of the interests of the community members concerning to recreational and other social activities.

They should also prepare a list of some technical requirements or general criteria in respect of the desirable features and characteristics of good school sites. These criteria, together with the noted features of the educational programme for the site constitute a set of standards or desirable characteristics against which the potential sites will be evaluated. The general criteria on which any potential site should be evaluated should include the following- safety and security, size, accessibility, noise level, location, topography, soil conditions, shape, utilities, and, if the site is to be purchased, the cost.

It may be necessary to spell out the details regarding some of these criteria to all members of the team in order to enhance objectivity in evaluation. Some of the critical ones include but are not limited to:

Safety and health

Safety and health are, undoubtedly, the most important consideration in the selection process. In regard to this, the committee should be familiar with any existing health and safety codes in the state, region or country. In all, the potential site should not be near any airport, high tension transmission lines, railroads, busy motorways, high pressure natural gas and water pipe lines; also, it should not be close to noisy places like markets and industrial establishments, facilities with hazardous air emissions and places with bad odour, toxic substances and other health hazards.

Size

The sufficiency of the potential site for the proposed programme and buildings, including outdoor and recreational activities, is also a critical consideration. The site should also have scope for expansion in order to accommodate future programmes and possible increases in school enrolment. The size of a suitable site should be determined solely by the nature of the present and anticipated future programmes and this size should be met with the initial site acquisition. This is necessary in order to avoid early obsolescence of the buildings and also to ensure that expansion of the school facilities will not be obstructed by the buildings and other structures that may be constructed close to the school by members of the community.

Location and accessibility

These are other important considerations in school site selection especially in regard to schools for young children. The school on a potential site should be easy to be reached by all children. Children must not descend valleys, walk through a stream or climb hills before reaching their school for obvious reasons. The site location should not be a difficult terrain like a hill, a valley or swampy place. The limitations imposed on the educational programme by such locations are obvious. The adequacy of the potential site will be enhanced if it is located where water sewers and other utilities can be provided easily. Other location considerations are equally important. The potential site should be located and developed in proper relationship with the existing and proposed physical facilities, such as libraries, parks, roads and hospitals among others in the community.

Cost

In those areas where school sites are usually purchased, the cost factor is also a serious consideration. It should be borne in mind that in such places the school must compete with commercial, industrial and other establishments for land. So, the cost of land will always be on the increase. It will, therefore, pay off to purchase early before the need becomes critical. The committee should bear in mind that the cost of landscaping and developing the site adds to the cost of acquisition. Purchase of places that will attract high landscaping costs should be avoided if possible. In sum, members of the committee should understand the rationale behind why some sites should be selected or rejected based on the established criteria.

In real life, no site will have all the desirable characteristics or meet all the established criteria. If there are many sites to select from, it may be necessary to prioritise them in order of the desired attributes. This task will be facilitated by making use of a worksheet to score the alternatives sites. The use of such an instrument enhances objectivity in arriving at the final choice to be made and recommended to the appropriate ministry officials.

SELF-ASSESSMENT EXERCISE

i. Describe, in details, how you would organise for the selection of the site of a new school in a rural area.
ii. Which four factors should be given serious consideration in the selection of a new school site? Give reasons for your answer.

3.3 Site Acquisition and Development

After the choice of a site has been made and approved by the appropriate agency or office, appropriate arrangements have to be made for the acquisition and development of the site. There are two common legal methods of acquiring land for school sites in the country. The more common method of acquiring land for use as a school is as donation by a community, a family or an individual. The majority of public school sites in the country today were acquired by the different ministries and Boards of Education through such a method.

The problem with acquiring sites through donations is that such sites may not meet many of the criteria for good sites. Some of them might have been very expensive to landscape and develop and some may be small for unimpeded implementation of the whole school programme and future expansion of the school while the shapes of some may be posing some design and planning problems. If the donated site is acceptable to the committee, the land should be surveyed immediately with its boundaries clearly defined for the school authority. The legal documents transferring ownership of the land should also be obtained and appropriately filed with the duplicate copies made available to the school authority.

In those school systems where school sites have to be purchased, it is good to aspire to get the best value for money. It is important to note that some sites may be cheap to purchase initially but very expensive to develop. Purchase of a site which may be initially very costly but may not attract big expenses to landscape and develop may prove to be cheap in the long run.

Development of the school site starts with the development of a suitable landscape and land use plan. If the topography of the land poses a problem, the plan should show the engineering solution to the problem. The plan should also show how horticultural features such as the development of lawns and selection of appropriate vegetation will be treated. This plan should be developed at the same time as the building construction plans are being developed.

Plans should be made with adequate funds set aside for landscaping of the site. The significance of giving the school buildings attractive settings should not be overlooked. Trees, shrubs and various ornamental plants should be used to beautify the site. Space must be set aside for playgrounds, school garden, and other services. Planting of trees, shrubs and grass may not all be completed at once and may need to be spaced out over the years. It is advisable to plant indigenous trees and shrubs and the trees should not be planted very close to the buildings so as not

to interfere with inlet of natural light to the classrooms. It is also a precaution against damage of school buildings by falling trees.

4.0 CONCLUSION

Selecting an adequate school plant is a complex but important task. It can best be performed by a team of people with all the necessary skills and competences. It is a task that involves a good knowledge of both the school's local community and the school programme. Adequate care has to be taken when selecting a site because success in operating the school programme depends to a very great extent on the choice made by the team.

5.0 SUMMARY

In this unit, you have leant that the school site is a very important consideration in school development planning. You should take note of the reasons given for this. You also learnt that the selection of a site is ideally done by team work and that the team should be made up of people with relevant skills and competences. These people should develop and make use of some criteria in performing this task. You also noted that as it is difficult to see a school site with all the desirable attributes, the team may have to make a choice based on some priorities. Finally, you learnt how sites are acquired and developed.

6.0 TUTOR-MARKED ASSIGNMENT

1. Explain the term 'school site'
2. List and discuss any two important factors affecting school plant selection.

7.0 REFERENCES/FURTHER READING

Council of Educational Facility Planners International (1995). *Guide for Planning School Plants*. Columbus, Ohio.

Stewart, G.K. (2006). *Avoiding School Facility Issues: A Consultant's Guidance to School Superintendents*. Charlotte, N.C.: Information Age Publishing.

MODULE 3 SCHOOL PLANT FACILITY DESIGN, CONSTRUCTION AND OCCUPANCY

UNIT 1 THE DESIGN PHASE

CONTENTS

1.0 INTRODUCTION

The construction of a new building or renovation of an existing one takes a long time and involves many types of decisions to be taken by a number of people. The focus in the whole of the last module was on planning for the development of the facility. Recall that a number of studies are required to determine whether or not the need for a new facility exists. If and when the need exists, educators have to specify the facilities that are needed for what activities and which people by preparing educational specifications. Educators are generally not good in designing the facilities that they need. The job has to be done by those in the design profession, notably architects, who have been trained to do it, in partnership with the educator and the client. In this unit, you will learn about the design phase of facility development; first, the focus will be on how to select a design professional, notably an architect to do the job, the phases of the design work that are common to all public school

building or renovation projects, and the role that educators have to play in order to ensure that the design meets their needs.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- discuss the criteria for selecting a competent architect to design the project
- describe the different phases of the design process
- state the roles of the architect, educational planner and the client during the design process.

3.0 MAIN CONTENT

3.1 Selecting the Architect

The architect is a design professional who plays an important role at almost every stage of the school plant development or renovation. During the planning stage which involves the identification of school plant need, development of educational specifications, and site selection, his role is mainly advisory but he is the key player at the design stage. Due to the importance of architects in the whole project, one is usually engaged right from the onset. It was suggested, earlier on, that an architect should be a member of the planning team. The service of the architect which usually commence right from the educational planning stage does not end until the facility is completely constructed by a contractor and taken over by the client.

It is therefore, very important that great care be exercised in selecting an architect or a firm of architects. It is usual to have many architectural firms interested in a particular school building design and construction. It is good for the client to establish some criteria for selecting the most suitable architect for the building project. The criteria should be so clearly spelt out that any competitor will be left in no doubt as to whether or not he/she is qualified to apply.

3.1.1 Selection Criteria

The Council of Educational Facility Planners suggests the following as some of the criteria considered in selecting a suitable architect.

(i) Registration and professional reputation

The architect should be professionally qualified and duly registered under the laws of the state where the project is to be built. The

professional standing or reputation of the candidate is an important basis for evaluation. This information can be easily obtained from informal conversations with fellow architects, his publications, if any, in academic journals, awards in recognition of his professional accomplishments, and active participation in other professional activities.

(ii) Experience

The experience of the architect is an important consideration. Attempts should be made to find out whether the architect ever carried out a project of the type, size, and complexity as the one that is under consideration. In the absence of qualified and experienced architects or if they do not show interest, a well qualified architect could be hired to give him an opportunity to demonstrate his/her competence.

(iii) Staff and facilities

The number and quality of the architect's staff should also be a major factor to be considered. The size of his office and the efficiency of its operation, including the organisational ability of the firm in handling complex projects should be of concern. It should also be ascertained whether the architectural firm also performs some engineering services or uses a consultant. The quality of the engineering services rendered or received from consultants should also be noted.

(iv) Methods of operation

The client should determine the manner of involvement of his own office in the project and his own areas of responsibility and decision-making. This will enable him or her determine whether the general mode of operation of the architect is compatible with his. The client has to find out whether the architect or another principal partner will be responsible for the work. The client should make sure the architect is a person with whom he can relate smoothly through the duration of the project.

(v) Quality of work

The client should insist on high standard of work from the architect. The projects completed by the architect's firm should be inspected for this purpose. The architect should be capable of doing a job that is aesthetically pleasing at a relatively low cost with low maintenance materials.

(vi) Interest in the project

The architect must be seen to show genuine interest in the work and consider it as a challenge, not just as another routine job. When the architect sees a job as a challenge, there is the likelihood that he will do a good job.

(vii) References

The former clients of the architect could be interviewed to find out how well the architect performed for them, and the qualities, strengths and weaknesses of the architect. Some of the clients of the architect may be asked for their recommendations.

3.1.2 Methods of Selection

A suitable architect can be selected in one of three ways. One of these is by *design competition*- which implies each candidate coming up with his/her own design of the project from which the client chooses one. This method is rarely used because it is time consuming and expensive. The second method is by *direct appointment* which is also rarely used in public projects like the designing and also the construction of school plants. The third method is by comparative selection. In using this method, the client must establish some criteria which should be objectively applied in the choice of the architect. In addition to the use of the criteria, the candidates must be provided as much information as possible about the project and how to apply including all the fees payable and deadlines. The information about bidding for a design job is similar to that given for bidding for building construction contract with which we shall deal in the next unit.

SELF-ASSESSMENT EXERCISE

i. Discuss any three criteria on which the selection of an architect for the design of a school building should be based.
ii. Why should great care be exercised in choosing an architect for such a job?

3.2 Designing the Project

When an architect assumes responsibility for the design of a project, he is expected to be familiar with the existing building codes and regulation including the local or state standards and procedures. During the design and construction stages, the architect has six major areas where his services are needed – pre-design planning, schematic design, design development, preparing construction documents, bidding, and

construction in addition to other areas. The architect, usually, starts the work with preliminary discussions with educators or the educational planner about the programme requirements form which develops a schematic view, gradually followed by a specific response to the programme requirements. He finally develops a set of instructions for a contractor showing the details of the intended facility. Each design phase builds on the previous one and involves interaction between the architect, the educational planner, a representative of the client and some other relevant professionals necessitating a team approach.

3.2.1 Pre-Design

A crucial pre-design activity is the preparation of the educational specifications, perhaps with some inputs by the architect. Meetings are held by the architect, educational planner and the client's representative for a thorough discussion of the document. The adoption of this document by the team and its subsequent approval by the appropriate authority, make it an invaluable reference source and the basis for evaluating the project. The document should be clearly interpreted to any other member of the design team. It is useful to hold the pre-design meeting at the proposed site of the buildings in the case of a new school or on the school premises in the case of remodeling or renovating a school building.

3.2.2 Schematic Design

This is the stage at which the architect makes diagrammatic representations of the intended facility based on the analysis of the educational specifications document. The objective is to develop simple sketches showing the rooms and their relative sizes and relationships as well as simple line diagrams of all systems-water, electrical and mechanical - to be installed in the facility.

If the architect had been part of the planning team from the onset of the project, interpreting the educational specifications will not pose any problem. If he was not involved at the pre-design stage he will need to hold a series of meetings with the educational planner to discuss and analyse the document. However, whether or not he was involved at the initial stages, he still needs to work closely with the educational planner, who may double as the representative of the owner, during the schematic design stage.

Before producing the diagrammatic representations of the facility, the architect and his design team will make a thorough study of the school site, its physical features, its relationship to public utilities (if any), transportation networks, and other existing structures in the community.

Cost studies will also be conducted in order to make sure that the building costs, especially with respect to the building materials, are within the limits of the budget. Should the cost exceed the available funds, there will be the need to either adjust the size or the aesthetics of the project or to consider raising additional funds.

At the schematic design stage two or more preliminary design solutions to the goals of the programme are produced by the architect after adequate interactions with the educational planner. The architect's diagrams are subsequently presented to the educational planner and the client who should take some time to study them and suggest any necessary amendments. It may be necessary to go through this process a number of times until a workable solution to the needs of the educational programme is reached to the satisfaction of everyone. This is a crucial stage in the development of any facility as any changes can be made with much ease. After this stage, it may be expensive to make such changes. There is therefore the need for extensive interactions and dialogues between the architect, the educational planner and the client until the design documents are approved by the appropriate authority.

3.2.3 Design Development

When the schematic design is approved, the architect starts to develop a more elaborate design of the facility. The basic elements as approved in the schematic design are further developed and fine-tuned. Elevations, models and sketches of the facility will be prepared to give visual impressions of the project. The individual room dimensions and relationships to other rooms are finalised, furnishings and equipment are fixed, utilities and service systems are also developed and located. After this, the architect prepares a more detailed cost estimate and submits it with the plans for approval by the appropriate authority. Just as at the schematic design phase, the plan may go for review and approval a number of times before a final approval by the government agency or the client is obtained.

3.2.4 Construction Documents

During this phase, the architect produces detailed documents or working drawings and construction specifications on which the contract for construction of the facility will be based. The working drawings spell out in sufficient details, the requirements for the construction of the whole project. The working drawings are concerned with quantity, showing the sizes, shapes, locations and relationships of spaces. Construction specifications are about quality of materials in regard to types, standards and makes. The construction specifications also contain information for bidding and construction. Both the working drawings

and construction specifications will cover all aspects of the building construction, electrical, mechanical, structural work and equipment involved in the project including any demolition work, site work, masonry, roofing, doors, electronic communications and other service systems.

At this stage, any necessary changes in the cost of the project which may have resulted from the changes following the reviews of the document are made and the detailed cost estimate is finalised. Following all these, project is moved to the stage of construction after advertising for bids and the contract is awarded.

SELF-ASSESSMENT EXERCISE

Describe the major activities involved during the schematic design and design development phases of school plant design process.

4.0 CONCLUSION

The design stage is crucial in school plant development. The success of the efforts at developing or renovating a school plant is determined to a very considerable extent by the quality of decisions made and the diligence with which all necessary activities at this stage are carried out. Any mistakes made at this stage, which are not noticed and corrected during construction may be very difficult and costly to make. This consideration justifies the amount of time, all the interactions and reviews of the designs and decisions which normally characterise this stage.

5.0 SUMMARY

The focus of this unit has been on the activities that take place during the design of the school plant. The architect and educational planner including the representative of the client are engaged in a number of pre-design meetings or discussions and analysis that will enable the architect proffer design solutions to educational problems. This assignment takes the architect and his team through the phases of schematic design, design development and construction document development. You were made aware of the extent of the interactions between the architect, the educational planner and the client or the representative, and also the many reviews to be undergone by the design documents before final approval.

6.0 TUTOR-MARKED ASSIGNMENT

1. State the guidelines you will offer to a planning team set up for a school building project on the selection of a competent architect.
2. Describe the design stage of school plant development and state its significance.

7.0 REFERENCES/FURTHER READING

Brubaker, C.W. (Ed.). (1998). *Planning and Designing Schools*. New York: McGraw-Hill.

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Holcomb, J.H. (1995). *Guide to Planning of Educational Facilities*. Lanham: University Press of America.

UNIT 2 THE CONSTRUCTION PHASE

CONTENTS

1.0 INTRODUCTION

In the last unit, we focused attention on the architect and learnt about how he develops working drawings and construction specifications to be used for processing tenders as well as for construction. All the planning and design decisions and activities are geared towards constructing or renovating buildings that will not only house the educational programme, but will also be safe for students and staff to occupy. These efforts will come to naught if the facility is not well constructed.

A number of important factors must be taken into consideration as the facility development process enters the construction stage or phase. One of the most important considerations is the safety of the occupants of the proposed facility. Adequate care should be taken to ensure that whoever is to construct such a facility is not only competent to do it, but must do so according to existing building codes and regulations. Again, it should be remembered that the school system has a limited amount of money to execute the project.

You would have noticed that all the while, we have not given attention to the funding of the project. This is based on the assumption that once the need for a facility or its modification has been identified, and the

process of meeting that need has been initiated, provision must have been made for funding it. This fund must be judiciously used by educational administrators and must be seen to have been so used by members of the public. Equally important is the fact that in choosing whoever will construct the facility, which is a public project, the due process must be observed.

In this unit, we will learn how educational administrators take care of these issues. You will learn about the use of tenders in the selection of contractors to do the work, the contract document, and how the construction project is managed to ensure that it is up to the required standard.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- describe how to invite and consider tenders for a building project
- state the principles to be observed in order to be fair to all those who wish to submit tenders
- highlight the activities involved in a school construction project
- state the roles of the different professionals involved in school construction project
- suggest ways of improving on the management of facility construction in the country .

3.0 MAIN CONTENT

3.1 Tendering Process

Once the working drawings and construction specification documents have been prepared by the architect and approved by the relevant government agency, the next line of action is to select the contractor that will satisfactorily construct the proposed structure. A good method of doing this objectively and judiciously in keeping with the laws of the land is by tendering or inviting and considering tenders for the job. This process is also known as bidding.

Tendering is the process of getting written quotations for work or service based on a set of documents which will form part of a contract with a successful bidder. In order to attract a good number of candidates for the project, the invitation to tender must be widely publicised. The procedure for doing this is usually prescribed in the relevant regulations and must be strictly adhered to. Tenders for a public building project like constructing school buildings or renovating one of a considerable

size are required to be advertised in local or even national daily or weekly newspapers.

3.1.1 Advertising for Tenders

Tenders for the building project should be given wide publicity. The advertisement should briefly, but clearly, give a description of the project, its location, the conditions for submitting, the opening and closing dates for the tender, the application fees, the required attachments (if any), the places where the tender documents may be picked up and deposited and some other bits of information that may be of interest to anyone interested in submitting a tender. The length of the time allowed for interested parties to prepare and submit tenders will depend on the nature and complexity of the project. If the number of applications is small towards the end of the deadline, it may be advisable to extend it in order that more people may participate.

3.1.2 Principles of Tendering

Advertising for tenders and participating in presupposes that there will be fairness to all and that sound contractual practices will prevail. Odell (1995) has proposed the following principles to address these issues.

- School authorities should have due regard to the cost of tendering.
- Collusion, hidden commissions and secret arrangements should be prohibited.
- All bidders should receive the same information.
- If a question is responded to, then all bidders should receive a copy of the question and the response.
- Adequate time should be allowed for a proper response to the invitation to tender.
- All tenders should remain sealed until specified opening time for all.
- Confidentiality of tenders must be assured.
- While it is not necessary for tenders to be opened in public, sufficient witnesses should be present, representing both the school and the consultants.
- Proper records of opening should be made, listing names and prices submitted as well as any conditions.
- Any parties with a conflict of interest should declare themselves (e.g. members of school boards wishing to tender for projects should resign from the board and/or distance themselves from the selection process completely).

It is obvious that some or all of these principles are supposed to be the practice in many school systems, but it is important that they be strictly adhered to.

3.1.3 Evaluation of Tenders

After the deadline for the receiving of tenders, tenders board members should meet to consider them. They should establish the criteria for choosing one bidder from among those that are qualified. It is good to bear in mind that the person to win the construction contract may not necessarily be the person to offer the cheapest price for the project. Such low offers may be due to an underestimation of the amount of work or materials involved or a ploy to win the contract first and then later begin to ask for variations. That explains the need for other criteria apart from cost considerations.

Among the criteria to be established, it is obvious that, qualification by experience, finance and equipment to do the work should feature prominently. The bidder must also be a registered contractor in the state where the facility is to be constructed, and that his registration must be valid at the period the tenders are being considered and will remain valid throughout the period of the construction work. After considering the tenders and abiding by the due process, the contract is awarded to the most suitable candidate for the project who then enters into a contractual agreement with the relevant government agency by signing a contract document.

The document is usually prepared by a legal adviser- in full-time employment with the Ministry of Education or by a legal practitioner whose services are hired for that and, perhaps, other purposes. The contract document consists of all documents, which when combined, form the basis of the contract. A possible list of such documents include: general conditions of the contract which define the legal rights and obligations of each party as well as the rules by which each party will operate in performing their obligations as set out under the contract; the special conditions of the contract which are extensions to the general conditions and apply specifically and individually to each aspect of the project or contract. Others are all drawings required to build the structure including architectural, structural and other drawings from relevant consultants; all specifications setting out technical requirements of the work; and other relevant documents including the schedules for construction and payment.

SELF-ASSESSMENT EXERCISE

i. What is the meaning of 'tendering'?
ii. Prepare a list of, at least, five criteria that can be used for selecting a competent contractor for a school building project.

3.2 The Construction Process

The Ministry or Board of Education can enter into different kinds of contractual arrangements in the execution of some school building projects. One form of arrangement and the most conventional is the single-contract variety. In this type of arrangement, one major contractor is awarded the contract. This major contractor, who is recognised by the owner as the one handling the contract, is the one that will be required to secure the services of subcontractors for the mechanical, structural, electrical and plumbing works required in the project. Under this type of arrangement, the main contractor is directly responsible to the owner.

Another form of arrangement is one in which the owner enters into separate contracts according to the disciplines of the subcontractors – civil, mechanical, electrical etc. - with each subcontractor being directly responsible to the owner. This may pose the problem of coordination for the architect and the owner. Other forms of arrangement include *construction management* in which the owner engages the services of a construction management firm to provide a continuity of leadership from the design phase through occupancy.

The firm makes considerable inputs to the architect in regard to cost, quality of materials and time which would be useful to him for preparing the documents for tender. The duties of the construction management firm ends once the facility is occupied. Another contractual arrangement is the *design/build* arrangement in which the firm does the design and the construction work. Under this arrangement the owner has only one firm or team to deal with (Earthman, 1986). Under any type of arrangement, however, there is the need for a pre-construction meeting.

3.2.1 Pre-Construction Conference

It is necessary to organise and hold a meeting between a representative of the owner, who should be an educational planner, the architect, engineers, the main or general contractor and subcontractors (if applicable), the prospective head teacher of the proposed school, the head teacher of the school (in the case of renovation projects) and other relevant officials, before work starts on the project. The purpose of the meeting is to introduce all the members of the construction group and discuss the entire project. The specific matters to be discussed include

the project time schedule, responsibility for coordination, work sequencing, use of premises, procedures for maintaining record documents, and for processing field decisions, change orders, applications for payments, and other relevant issues. In situations where some of these issues are covered in the contract document, the meeting may just serve as a reminder.

3.2.2 Construction Scheduling

In most construction contracts the contractor may be required to submit a construction schedule showing the sequence of construction activities, the dates for the delivery of some important equipment and materials as well as the dates for all events and milestones leading to completion. Bergeson (2008) identifies the Critical Path Method (CPM) analysis as the schedule format that demonstrates the most useful information. The method identifies those project activities which are critical to timely and sequential completion of work. Such project activities are the ones that great care should be taken to ensure that they are completed on schedule. Otherwise, the entire building project may not be completed on schedule.

3.2.3 Construction Inspection and Supervision

The owner needs to ensure that the construction work proceeds in an orderly manner and that all contract documents and building specifications are met. There is the need for efficient and effective supervision and inspection of the project. The Council of Educational Facility Planners (1969) distinguishes between the two functions in terms of their respective scopes. Inspection, according to the council, involves a detailed observation of specific materials, processes and procedures to ensure that the standards specified in the contract document are confirmed.

Supervision, on the other hand, may be much broader. It may include inspection and coordination of the entire project in relation to the overall intent and has implications of control over activities. Both functions are aimed at making the construction project achieve three major goals, namely, to (i) obtain the specified value, (ii) obtain effective utility, and (iii) assure that the project is completed and the facilities made available within the specified time. These goals may not be realised through the periodic supervision and interpretation of the contract document by the architect. The daily inspection of construction and of the materials in particular that is required to protect the owner's interest can only be adequately done by the owner's supervisor.

A clerk-of-the-works or schedule officer, preferably, a full-time staff of the Ministry or Board of Education who is qualified to inspect the project should be appointed before time and his position should be defined in the contract document. While the architect or his appointee sees to the general supervision of the project, the schedule officer continuously observes the quality of the materials and work and points out any possible mistakes that demand the attention of the contractor. It is recommended that the schedule officer should inform the architect about such possible defects and should not give instructions to the contractor. This is one of the ways of ensuring that the quality of work is secured.

3.2.4 Job Meetings

It is the responsibility of the architect to ensure that regular on-site meetings are held with the contractor, sub-contractors, relevant consultants, and the schedule officer or clerk-of-the-works. These meetings, also known as job-progress meetings, are necessary in ensuring that work is progressing according to schedule. It is at these meetings that any problems which may arise on the project are usually addressed. Minutes of the meetings, all decisions that affect the contract and all clarifications should be recorded and distributed to all concerned parties.

3.2.5 Payments

The typical method of payment is that at the agreed periods, often specified in the contract document, the contractor submits to the architect, a statement of the work completed and materials provided. The requests for payment normally reflect the status of the contract cost, disbursements to date, contract retainage (or funds withheld until final completion and acceptance of the project) and the balance of the work to be completed. If the request is approved, the architect forwards the application and a recommendation to the Ministry or Board of Education where it may be checked by the relevant unit.

3.2.6 Final Completion

Final completion of work occurs when the construction work is concluded and the contractor has effected all the corrections that might have been pointed out as the work progressed. The contractor then submits a certification that all project requirements have been fulfilled according to the terms of the contract. The architect, the contractor, and the owner’s representative will then conduct a final inspection of the project to confirm that it has been completed according to the terms of the contract.

If all parties are satisfied with the quality of the work, the architect will request for the specified project closeout information from the contractor. He is expected to submit it along with the following: project record documents or as-built drawings and specifications; any operation and maintenance manuals for installed equipment and machines, including their guarantees and warrantees, all the keys; maintenance materials and spare parts (when required), and all other items as may be specified in the contract document.

SELF-ASSESSMENT EXERCISE

i. Explain the term 'construction scheduling'. What is its usefulness to an architect during the construction process?
ii. Explain the value of (i) pre-construction conference, and (ii) job meetings in school facility construction.

4.0 CONCLUSION

The construction phase is critical to the success of all planning and design efforts in school plant development. The efficiency and effectiveness of work during the construction phase depends mainly on the competence of the contractor and his team of subcontractors and workers but also on the diligence with which the inspection and supervision functions are performed by the owner's representative and the architect respectively. On-site or job meetings are essential for coordination of work and addressing any emergent problems as the work progresses.

5.0 SUMMARY

In this unit, you learnt about tendering or what is also referred to as bidding. You learnt how to advertise for tenders and how to evaluate them in such a way as to ensure fairness to all parties. You learnt about a set of principles which, if adhered to, will not only enhance fairness to the parties involved but will also enable the tenders' board to obtain good value for public funds. Construction work starts after the tenders' board has awarded the contract to a successful bidder.

You learnt about the meetings that should be held to facilitate the construction process. You also learnt about construction scheduling, the modalities for payment, the final inspection of the project by the architect, contractor and owner's representative on the completion of the project, the certification of the project as having been completed, and the items expected to be handed over to the owner by the contractor following the completion of the project.

6.0 TUTOR-MARKED ASSIGNMENT

1. What is 'tendering'? What measures can you take to ensure that there is fairness to all parties and that good value is got for public funds?
2. What suggestions can you make to a relevant agency of the Ministry of Education towards ensuring that an on-going school construction project is executed according to the expected standard?

7.0 REFERENCES/FURTHER READING

Bergeson, T. (2008). *School Facilities Manual for the School Construction Assistance Programme.* Washington: Office of Superintendent of Public Instruction.

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UNIT 3 FURNITURE AND EQUIPMENT

CONTENTS

1.0 INTRODUCTION

In the preceding units, we have been addressing the decisions and activities that have to do with the development of the school building. Sometimes, school administrators embark on planning, designing and constructing school buildings without giving due consideration to the issue of furniture and equipment. This is often based on the assumption that the provision of furniture and equipment is a lesser problem than putting up the building. Another reason is that some of them believe that furniture and equipment can always be purchased at any time and moved into the building.

Our concern here is not with the merits or demerits of these positions. The important point is that school furniture and equipment are integral parts of the school plant, and without them the school building is almost useless. Without furniture and equipment the operation of the school plant becomes almost impossible. There is the need to put them into consideration, right from the initial stages of the building project. The reasons for this will be made clear to you in due course.

In this unit, you will learn how to determine a school's requirements for furniture and equipment. You will also learn about the desirable qualities of school furniture and equipment and how to select, purchase and get them installed.

2.0 OBJECTIVES

At the end of this unit you should be able to:

- explain how to determine the requirements for furniture and equipment in schools
- state the desirable qualities of good school furniture and equipment
- highlight how to write specifications for furniture and equipment
- describe how to manage the installation of school furniture and equipment.

3.0 MAIN CONTENT

3.1 Furniture and Equipment as Part of School Plant Planning

The term 'furniture' usually refers to such items as desks, tables, chairs, seats and benches. They can be made of wood, metal or plastics and are usually easily moveable. Equipment refers to two types of items – those attached to the building, e.g. built-in lockers, kitchen cabinet and air conditioners; and those not attached to the building, e.g. globes, television sets, picture projectors, computers, and some games equipment. These and similar items are essential elements of the school plant without which the school buildings will not be functional.

The Council of Educational Facility Planners (1969: 135) has explained why the proper time to think about them is before and during the designing of the buildings. This, according to them, is due to the mechanical and electrical requirements of some furniture and equipment.

> …Telephone and electrical requirements, conduit lines for audio-visual, television and other complex electronic and electrical equipment must be designed in accordance with expected furniture and equipment uses. If furniture and equipment specifications are put off with the idea that they can be designed and purchased later, it will present a future problem for mechanical and electrical design. This approach often leads to costly and unsightly alterations in the building simply to satisfy furniture and equipment accommodations not satisfied in the original design.

A necessary first step in planning for the provision of furniture and equipment for a proposed school or an existing one undergoing renovation is to determine its requirement for these items.

SELF-ASSESSMENT EXERCISE

At what stage in the development of a new school building is it appropriate to start considering furniture and equipment? Give reasons for your answer.

3.2 Determining the Need for Furniture and Equipment

We have stated earlier on that, furniture and equipment are parts of the school plant. In addition, it was stated that the school plant is a tool for implementing the school programme. The determination of the requirements for them depends primarily on the nature of the school programme and the methods of delivery, in addition to the needs of students and staff of the school. Specifically, the furniture and equipment requirements of a school are determined by the contents of the curriculum and the teaching and learning activities associated with them; the needs of the students and staff for a comfortable and healthy accommodation as teaching and learning go on; the approaches of the teachers to lesson delivery; the functions and services performed by the non-teaching staff; and recreational activities of students and staff members, among other factors.

A realistic determination of the furniture and equipment requirements of the curriculum involves identifying, in each curriculum area, the general and specific activities the students undertake and the furniture and equipment needed for them. General activities refer to those that span the whole curriculum and require the same furniture and equipment, e.g., desks, tables, chairs, and audio-visual materials. The subjects that require specific activities include wood work, metal work, chemistry, etc. which require special furniture and equipment.

The functions and services of some non-teaching staff require office equipment like computers, and fax machines in addition to furniture such as tables and chairs while sports and games equipment are required for physical and health education and recreational activities. In addition to these, a school requires a hall, a library, and where applicable, hostels, food and health services and the necessary furniture and equipment.

An aspect of the educational programme of a school that may deserve attention as far as furniture and equipment are concerned is the overall teaching style in the school. For instance, a school may be making use of close circuit television, regular television and video presentations, or

make use of some radio programme presentations as part of the teaching process. All these have their implications for both the furniture and equipment in and the layout of the rooms.

The approach to storage of materials and supplies in a school also affect the provision of furniture and equipment. Having a central storage unit for a whole department or to serve a number of blocks of buildings, or having one in each classroom has implications for the number and type of storage furniture that will be required by the school. For a new school, the number of all relevant items of furniture and some of the equipment depends on the type and number of students as well as the number of school staff and the types of student support services that they offer. All these considerations should feature in the planning and designing of the school plant.

When considering the provision of new furniture and equipment for an existing school, it is good to take stock of the ones that are in good condition, and those that need to be refurbished before deciding on the number to be purchased. It may be better to refurbish old ones than to buy new ones especially where considerable savings in cost will be made by so doing, with the items brought to as near its original state as possible.

SELF-ASSESSMENT EXERCISE

Discuss any two of the factors that determine the provision of school furniture and equipment.

3.3 Market Search

Having determined the requirements of the school for furniture and equipment, the next step is to consider how to meet the need in terms of number and type of each item. A good starting point is to have an idea of the types of the items available in the market. There are a number of approaches to this task. Education trade fairs and exhibitions afford school administrators opportunities to have ideas of latest developments in education industry. Such fairs usually feature new book publications, new equipment and materials and may also feature new types of furniture. Such fairs enable them to make comparisons between similar products by different makers. It may also afford them good opportunities to know the prices of such items

Another approach is to order or obtain the relevant catalogues and brochures from the makers or manufacturers of furniture and equipment. These documents usually give information on the furniture and equipment produced by different manufacturers and the quality, types

and levels of service that they offer. The prices of the items are also listed in the brochures and catalogues. Wherever available, current and relevant brochures should be carefully studied whenever the provision of school furniture and equipment is under consideration.

In regard to the provision of furniture, school administrators may visit the workshops of some local furniture makers, have a look at their products and discuss the possibility of producing the special types that they may require. This approach is very useful when small quantities of such items can be acquired by direct purchase within the limits of the relevant regulations. Other approaches to market search for suitable school furniture and equipment include some publications which can provide useful information on the kinds of products required in different subject areas of the curriculum. The internet is also a good source of information on such matters.

SELF-ASSESSMENT EXERCISE

Discuss the different ways by which you can obtain information on the types of furniture and equipment that are needed in a school.

3.4 Selection of Furniture and Equipment

Once the furniture and equipment requirements of the school have been determined and the types available in the market have been identified in one or more of the ways highlighted above, the next task is to select the suitable ones. For a new school building to satisfy the needs for suitable learning environment, adequate and comfortable accommodation for the occupants, there is the need to give considerable attention to the selection of the appropriate furniture and equipment. Some useful criteria for selection include:

The type of school in which they are to be used

The sizes of the furniture in particular depend on whether the school is a primary or secondary school.

Durability

The furniture and equipment should be such that can be used for a fairly long time before they need repairs or refurbishment. All the furniture should be made of durable materials. If possible, samples of the items should be tested under the conditions in which they are to be used before a final decision is reached.

Comfort

The furniture should be of adequate height to enable the user sit comfortably and write, read and perform all necessary learning activities conveniently. The furniture units should, if possible, be adjustable in order to meet the different needs of children who may be in the same age bracket but with different physical characteristics.

Safety

The furniture and equipment should be such that the children can use or handle safely. They should not have sharp and protruding edges and corners. They should not easily tip over; break glass or collapse when in use.

Flexibility

Although it is desirable for items of furniture to last long, the need for flexibility should always be borne in mind because of possible changes in the educational programme of the future. Making them movable to allow for easy arrangement and re-arrangement is one of the ways of allowing for flexibility in the use of the items.

Availability

Before any negotiation for the purchase or ordering of the items of furniture and/or equipment, it will be in order to make sure that they will be available in sufficient quantity and that those of them which need to be delivered as construction work is in progress will actually be available when needed.

Cost

When the above-mentioned criteria have been met, the next important consideration is that of cost. The initial cost of an item may be high but the item may be used for a long time before the need for repairs arises. The initial cost of another may be low but it may either not be used for long before replacement or it may require regular repairs or refurbishment thereby making it eventually very costly. In the final analysis it is better to buy high quality but costly goods that will last long and provide the needed service than to buy the initially cheap ones that may not satisfy the intended purpose. In situations where there may not be enough funds to go round, it may be advisable to prioritise the purchase of the items with the ones needed during the construction of the buildings being ordered first and others purchased later.

SELF-ASSESSMENT EXERCISE

List and describe at least four important criteria on which you can base the purchase of school furniture and equipment.

3.5 Purchasing the Items

Provided that the consideration of the provision of furniture and equipment started early enough, the time spent on determining needs and exploring the market before deciding on how to purchase the items is usually worth it. This is because of the need to get value for money intended to be spent on the items. Getting value for money does not, however, imply buying cheap goods but obtaining the right prices in terms of quality, durability, availability of spare parts, and other considerations.

3.5.1 Specifications

Before negotiating for the purchase of the items, it is necessary to prepare specifications to clearly describe in sufficient details the types of items to be purchased, the quality and quantity of each item, the size, standards of manufacture, and colour where applicable. Assistance for performing this task may be sought from the architect, interior decorator or equipment consultant including all the people who are involved in planning and designing the buildings. As in the case of writing educational specifications, the specifications for furniture and equipment should be written in simple, concise and clear language. The items should be categorised in any suitable way during the preparation of the specifications.

Procurement of the items should be done according to appropriate rules and regulations. In some educational systems the law allows for direct purchase when the number of items involved is very few or when their total cost does not exceed a specified amount of money. In most cases, when the expenditure of a large amount of public funds is involved, as will usually be case with purchasing the furniture and equipment for new school buildings, the items have to be purchased by tendering or bidding. In this regard, it should be noted that the furniture and equipment specifications document will constitute part of the purchase contract document.

3.5.2 Tendering

Procuring the items by tendering follows similar procedures as tendering for construction jobs with only differences in the nature of the contract. Tenders have to be advertised with all the details supplied including the

specifications, criteria, opening and closing dates for submission of the tenders. At the expiry of the deadline which may be extended if necessary, the quotations from the different suppliers are evaluated and the successful suppliers are informed. Accepting suppliers' quotations and informing them implies acceptance of their terms. It is necessary, however, to seek and obtain clarifications wherever there is doubt before finally entering into any form of contract with them.

The contract terms should provide for an early delivery of those items that may be needed during the construction work while the rest may be delivered following the completion of the buildings. This is to avoid the problem of warehousing the items before they are moved into the buildings. Otherwise, proper arrangements have to be made for their storage before they are used in furnishing and equipping the buildings.

3.6 Installation

The installation of some of the furniture items and equipment is an important task that should be done with great care as some careless installations at this stage may later pose some dangers to the occupants of the buildings. Again, it is good to seek the assistance of the architect, interior decorator or equipment consultant.

The items to be installed during the construction work need to be delivered on time. Otherwise the construction work may suffer some delays. Such delays will ultimately affect the targeted date of occupancy of the structures. It is necessary to check all the items before installation to ensure that they are all of the desired quality. This is to prevent dismantling of the installed item shortly after being put into use leading to more expenses and defacing newly constructed buildings.

All instructional manuals for any of the equipment and guarantees from the suppliers should be carefully filed and stored. Any detected defects during the use or handling of any item of furniture or equipment before the expiry of the period of guarantee should be promptly reported to the supplier and followed up until a replacement is obtained.

SELF-ASSESSMENT EXERCISE

Describe the steps you will take to obtain high quality furniture for your school.

4.0 CONCLUSION

Furniture and equipment are very important elements of the school plant. It is not possible for the educational programme to operate at a

school site without them. It is not good to leave them out of consideration until after the completion of the building project. The selection and purchase of these items should be done with great care in order to ensure a safe and comfortable environment for the occupants. Cost considerations should not take precedence over all the desirable qualities of good furniture and equipment. Those items that need to be fixed or mounted during the construction stage should be delivered on time in order to avoid any delay of work on the project. They should also be carefully installed in order to avoid possible mishaps in future.

5.0 SUMMARY

Our focus in this unit has been on school furniture and equipment. The importance of the two items in education was pointed out. Reasons were given why they should be considered very early in the school building project. How to determine the requirements for them in a school and how to search for them in the market were briefly discussed. We later highlighted the criteria for selecting suitable furniture and equipment. After this, we highlighted the procedures for purchasing them, and finally noted the need for installing some of them carefully during the construction work.

6.0 TUTOR-MARKED ASSIGNMENT

1. Should the provision of furniture and equipment be considered only after the completion of a school building project? Give reasons for your answer.
2. Discuss any three important criteria on which the selection of school children's furniture should be based.

7.0 REFERENCE/FURTHER READING

Council of Educational Facility Planners (1969). *Guide for Planning Educational Facilities.* Columbus, OH.: Council of Educational Facility Planners.

UNIT 4 OCCUPANCY AND POST-OCCUPANCY EVALUATION

CONTENTS

1.0 INTRODUCTION

At the end of the construction work, the school buildings are furnished and all the equipment is put in place. It is now time for the school staff and students to move in and put them into use by operating the educational programme. In this unit, you will learn about the activities that should take place before, during, and shortly after moving into the buildings and putting them into use. Specifically, you will learn about the induction or orientation of the occupants to the building and why and how the buildings have to be evaluated shortly after it has been occupied.

2.0 OBJECTIVES

At the end of this unit you should be able to:

- describe the activities involved in occupying a school building
- explain why a building should be evaluated after it has been occupied
- conduct a post-occupancy evaluation study.

3.0 MAIN CONTENT

3.1 Planning for Occupancy

This is an aspect of school development planning that has received virtually no attention in Nigeria. This state of affairs may be attributed to

the very simple nature of our school buildings and structures as we noted earlier. Thinking about occupancy may not be considered necessary as long as the buildings have been certified fit by the responsible government ministry or agency. It may also be argued that such an exercise is only necessary for built environments for which it is necessary for the occupants to learn about the specialised facilities installed in them, in order to know how to use them properly. No matter how simple a structure may be, it is necessary that the occupants should understand it before occupying it. This is necessary for both a newly constructed building and an old one that has been renovated.

In any school building project, the planning, designing, and construction are done by individuals and groups who do not belong to the school, but it is school children and staff that occupy and put it into use. It is, therefore, necessary that those to occupy the building should be made to know how it operates. Ideally, some teachers and the head teacher, in the case of a remodeled school, or the head teacher of the new school, are/is supposed to have been involved in the formulation of the educational programme, but none was probably involved in the construction of the buildings. They have to be given some orientation in the building. All other staffs who are expected to work in the new facility should know how it operates. They have to be shown where certain facilities are located. If there is any new equipment in the building they have to know how it is operated or handled. They have to be shown what health and safety features there are in the building and how they are operated.

The architect or the educational planner who must have played a leadership role right from the planning stage, and some other people who played a key role in the project including the head teacher should be responsible for planning and implementing the programme. It will be good if the orientation is organised in three phases- one for the teachers in the school; another for the non-teaching staff including the administrative staff, those staff that provide student support services, and the custodial staff and the day and night guards who are expected to take care of the facility; and the third for some members of the community who usually request to make use of the facility from time to time.

Before the orientation programme takes off, efforts have to be made to ensure that everything is in order. As the objective is for members of the school to take occupancy of the facility, efforts should be made to make the school buildings and grounds safe for children. The major management tasks of the head teacher at this time, whether as the head of a renovated school or a new one; are to make all necessary school staff appointments and seek the approval, if desired, for student occupancy.

3.2 Orientation

Orientation of the teaching staff should be aimed at enabling them to understand the functioning of the building and how it supports the educational programme. It may include a number of activities, a tour of the building(s) with those who were responsible for its construction with the latter explaining any features, gadgets or systems with which the teachers may not have been familiar; mock fire drills using one of the new firefighting equipment installed in the building; and a question and answer session with the architect and members of his team. Similar orientation activities should be organised for other staff members of the school to acquaint them with any new materials or finishes and how to handle them. If some maintenance personnel are employed by the local or zonal education office, they should be made to join the non-teaching staff of the school during this phase of orientation.

It will be good if some members of the school's local community, especially those who have shown interest in the school in one way or another, are also invited for orientation together with any of the two groups of school staff mentioned above, or as a separate group on its own. Participation in the orientation programme of the school is a school-community relations activity which may make the members of the community have more interest in and be very supportive of the school.

SELF-ASSESSMENT EXERCISE

Do you consider it necessary to plan for the occupancy of a new school building? Why?

3.3 Post-Occupancy Evaluation

After the orientation of the school staff and some community members and the subsequent occupation of the facility for at least one full school year, a post-occupancy evaluation by educators is recommended. Post-occupancy evaluation is the process of systematically evaluating the degree to which occupied buildings meet user needs and organisational goals. It is defined by Friedman, Zimring and Zube (1978: 20) as "… an appraisal of the degree to which a designed setting satisfies and supports explicit and implicit human needs and values of those for whom the building is designed."

Hawkins and Lilley (1998) specify that within the context of school facilities, post-occupancy evaluation is most concerned with the degree to which the building supports the goals of the educational process by measuring the physical environment's educational adequacy. This

evaluation exercise is carried out in the school systems of some developed countries. It is probably right to say that it does not constitute part of school plant management practice in Nigerian. The assumption seems to be that once a new school building has been completed, approved by the appropriate government authority, and handed over to the school authority, then all is well with the facility.

It is not common practice to promptly report any defects observed after a very short period of occupying the facility even though many of them are aware that it is good to report such defects and have them corrected before the final building contract payments are made. Hardly have school administrators given any thought to the contributions that post-occupancy evaluation can make to effective school plant management.

3.3.1 Forms of Post-Occupancy Evaluation

Meaningful post-occupancy evaluation requires the evaluation of two things-the product and the process. Earthman (1986: 641) rightly points out that "the product of the school planning effort is the building itself, and the process is all the activities of the many groups and persons involved in planning and constructing the facility. Both product and process are legitimate subjects of evaluation." Both of them need to be evaluated as one of them leads to the other. Any limitations or merits of the process reflect directly on the product.

(i) Process evaluation

Process, in this context, refers to the forms of power relationships, leadership, decision-making and communication patterns and courses of action adopted or used for planning, designing, and constructing the facility. All these elements should be evaluated while they are still fresh in the minds of all those who participated. People and agencies who participated at one stage, time, or another should be surveyed to determine what they feel about the process, its strengths and weaknesses, and their suggestions about how to improve it.

There are many ways of gathering data for this purpose. Questionnaires, interview schedules, or focus group discussions can be used to gather the relevant data. The data required include the subjects' opinions regarding their contributions as individuals and as groups as well as other peoples' contributions to the project, problems (if any) encountered by them at any stage of the process in which they were involved, and their suggestions for improvement.

(ii) Product evaluation

The product is the outcome of the process and refers, in this context, to the building itself. This form of evaluation is done by the people who occupy and/or operate the building. The objectives of this evaluation are to determine how the building operates, the extent to which it suits the educational programme that it houses, the costs of operating the facility, and the quality of the facility including the furnishings and equipment. The opinions of the end users about the impact of various service systems, new equipment, architectural designs and educational innovations on the educational programme, should also be determined.

The same type of instruments used in the process evaluation can also be used for product evaluation. The purposes of the study should be clearly identified by those conducting it and clarified to the participants. Data gathered with the instruments mentioned above can be supplemented with those collected by observation. The results from such an evaluation will be of much benefit not only to educational administrators but also to those in the design and construction industry in various ways if they are followed up with appropriate action and backed up by relevant policies. In the next section, we shall highlight some of the benefits derivable from evaluating the processes and products of school plant development efforts.

3.3.2 Benefits of Post-Occupancy Evaluation

Although some school administrators in educational systems of both the developed and developing countries of the world may be unfamiliar with the concept and practice of post-occupancy evaluation, some writers have acknowledged their potential benefits in educational design practice and, by extension, school plant management. Zimring and Rosenheck (2001) for instance, summarise some of these benefits as follows:

- It aids communications among stakeholders such as designers, clients, end-users and others.
- Creates mechanisms for quality monitoring, similar to using student testing to identify under-performing schools, where decision-makers are notified when a building does not reach a given standard.
- Supports fine-tuning, settling in and renovation of existing buildings.
- Provides data that informs future decisions.
- Supports the improvement of building delivery and facility management process.

- Supports the development of policy as reflected in design and planning guidelines.
- Accelerates organisational learning by allowing decision makers to build on success and not repeat failures.

These and other benefits derivable from post-occupancy evaluation studies justify the proposals to advocate for the institutionalisation of post-occupancy evaluation within the normal operations of organisations (Zimring, 1988). It could be argued, as has been pointed out above, that this type of evaluation is suitable for only the educational systems with complex school buildings and built educational environments. It could equally be argued that it is also good for the educational systems with less complex or even simple school buildings.

This is because each school building in any context is supposed to facilitate the implementation of the educational programme. The buildings themselves represent heavy investments by communities or governments. They should be of the highest possible quality to justify the financial and other expenses. The buildings should be found useful to both students and teachers for carrying out their academic and other activities and for meeting their personal needs. It is only right that such evaluations be done in order to determine the adequacy or otherwise of the buildings and structures and corrective measures taken if necessary.

Adopting the practice of post-occupancy evaluation of school buildings in Nigeria should be a welcome development as the nation in general and school administrators in particular stand to gain most, if not all, the benefits highlighted above. It may be an effective way of checking the incidence of school building deterioration within a short period of occupancy as a result of poor workmanship by contractors. Contractors will endeavour to do good jobs if they are aware that the buildings that they constructed will be evaluated after occupancy. Post-occupancy evaluation can only have the intended effect, however, if sanctions are applied to those contractors whose products fall short of expectation.

SELF-ASSESSMENT EXERCISE

Is it necessary to organise an orientation for the people who are to occupy a newly completed school building as well as the members of the school's local community? Why?

4.0 CONCLUSION

Organising orientation programmes for the prospective occupants of a newly completed school building is good practice. Involving the members of the local community in such an activity may be an

opportunity for the school to earn the goodwill of the community members. It is equally good to evaluate a school building for its educational adequacy shortly after the occupancy of the building. Such evaluations have high potentials for leading to improved practice among the design professionals and educational managers.

5.0 SUMMARY

In this unit, you learnt about the necessary activities that should take place before a newly completed school building is occupied by the children and school staff for whom it is built. Conducting orientation for the intended occupants of the building before moving in enhances its effective and efficient use. You also learnt why it is often necessary to invite the members of the school's local community to participate in the orientation activities.

After the school building has been put into use for about a year or so, it is necessary to find out to what extent it serves the purposes for which it was constructed. Also in this unit, you learnt how to conduct a study to determine this and the instruments that can be used. Finally, you were informed of the many benefits that can be derived from conducting post-occupancy evaluation surveys. It was suggested that making post-occupancy evaluation part of school plant management practices in Nigeria will be beneficial to the educational system.

6.0 TUTOR-MARKED ASSIGNMENT

1. Distinguish between process and product evaluation in post-occupancy evaluation.
2. What are the likely benefits and the possible problems of introducing post-occupancy evaluation in the management of school plants in the country?

7.0 REFERENCE/FURTHER READING

Earthman, G.I. (1986). *Facility Planning and Management*. Reston, VA.: Association of School Business Official International.

MODULE 4 SCHOOL PLANT OPERATION, UTILISATION AND MAINTENANCE

UNIT 1 SCHOOL PLANT OPERATION AND UTILISATION

CONTENTS

1.0 INTRODUCTION

Constructing a new school plant or expanding an existing one is a complex task consuming a lot of resources and time. A school plant, whether old or new, is a tool for achieving educational objectives. All efforts and investments in this tool may not be worth it if it is not put into proper use. Improper use of it may also have some negative effects on the educational opportunities of children. Improper operation and use may also contribute to the reduction of the functional life of a school building or an aspect of it as well as damage to some equipment.

This unit will introduce you to the concept of school plant operation and utilisation. You will learn about the activities involved in operating the school plant. You will also learn how a school head can utilise the different aspects of a school plant effectively and optimally for the achievement of educational goals and objectives.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the meaning of school plant operation
- identify the different areas of concern in school plant utilisation

- discuss how school buildings, equipment and space can be optimally used
- describe how to organise for effective plant operation.

3.0 MAIN CONTENT

3.1 School Plant Operation

How long a newly constructed school plant or an existing one will continue looking good, attractive and functional depends very much on how it is operated, used, and maintained. Maintenance and operation are closely related concepts but two different functions. It is customary to treat or discuss maintenance and operation together probably because of the overlap in some aspects of the two functions. In some school systems, the same staff may be responsible for the two functions. Some school systems are, however, large enough to employ custodial and maintenance staffs, separately. The two functions are treated separately in this course. In this unit, we shall focus only on utilisation and operation, or the housekeeping aspect of the school plant. A clean and functional school plant is vital to the success of any educational programme. According to Earthman (1986), "all of the successes in planning and designing a school facility are overshadowed by poor housekeeping."

School plant operation consists of the services and activities required to keep the school plant functioning. It includes cleaning, disinfecting, caring for grounds, and similar housekeeping duties which are repeated somewhat, regularly (Knezevich, 1975). Plant operation is concerned with ensuring that the school pant is open for use, neat, comfortable, safe, and in good sanitary condition for the occupants. It is the duty of the head teacher to see that all the activities necessary to keep the school plant in that condition are performed each day that the plant is to be put into use or is in use.

In Nigeria, this aspect of school plant management does not often receive the required attention. It is only in a few public primary and secondary schools that very few people responsible for operating the school plant are employed. Even in such places, there are no clearly defined school plant operation programmes. This state of affairs may be due to the following reasons:

- There is lack of funds for the purpose.
- The importance of that aspect of school plant management is yet to be realised by educational administrators and policy makers.

- Most of our school buildings are very simple structures, consisting of blocks of buildings partitioned into classrooms of equal size and require no special skills to operate.
- Student free labour is easily available on a daily basis to perform the necessary functions. Students can easily be organised to sweep the classrooms and pick up any litter on school grounds every day before the commencement of lessons.
- The relatively few and simple structures on most of our public school sites are not enough to justify the employment of full time staff to perform those services.

The inadequacy of our school plant operation practices and the attitude of school administrators and policy makers are often reflected in the look and appearance of many components of our public school plants. A visit to some schools reveals that students' efforts are not enough to keep many of them in the desired condition. Some of the walls of the buildings and the classrooms are dirty and dusty and are often defaced with graffiti. In some schools, cobwebs are seen on the ceilings and corners of walls and the playgrounds and lawns are overgrown with grass. It is not unusual to observe that the floors of some of the classrooms are littered with pieces of paper while lessons are in progress. These observations indicate the need for housekeeping personnel or custodians in our public schools.

Also, our schools for the future may not be as simple as the present ones. Each of them may require a number of skilled people to take care of special facilities and equipment for teaching and learning that may need to be stored under special conditions. With imminent changes in curriculum content, changes in building technology, and new developments in support services new types of support staff may be needed in our schools in future. Already, developments in information technology have brought about changes in the organsation and physical form of schools. According to Lackney and Pious (2009: 7):

> Learning settings are being designed to support individualised, self directed learning and small informal group learning, in addition to traditional large-group instruction. Rather than lining up classrooms along a long corridor, instructional areas are being organised around central cores of shared instructional support.

These are recent developments in American educational system which may find their way into our own system as time goes on as computers are finding their way into our educational institutions including some primary schools. However, we may not have to wait for developments in future in order to start meeting the present demand for custodians in our

public schools. Considerable economy will be achieved by employing them centrally, by various Zonal or Local Education Offices from where they can be posted to schools. These same offices should be able to develop relevant operation programmes for taking care of the schools under their control. An individual in the zonal office, who may be designated as the school plant supervisor, should be charged with the following responsibilities in regard to the public schools in his zone:

- Keeping all school buildings clean and ensuring that the school toilets are in good sanitary condition at all times.
- Opening and locking up the school buildings for use and after use on school days.
- Distributing all equipment and materials for use and storing them after use.
- Keeping the grass on the lawns and playgrounds low at all times and keeping the school grounds free of rubbish especially sharp and pointed objects.
- Taking care of the hedges, flowers and trees in the school.

Other equally important custodial responsibilities are plant security and preventive maintenance. In regard to plant security, most public secondary schools in particular have security men to perform this function. In some of the schools, there are day and night guards. The function of these guards in most cases is limited to the control of vehicles and human traffic, especially of the students, through the school gate during school hours.

The guards can be made more useful in schools by giving them the responsibility of locking up the school buildings; questioning any strangers loitering around school premises, not only those passing through the school gate, and referring them to the office of the school head. The guards should notify the school head when children or others move around the school area in a questionable manner either during or after school hours; and also contact the police in serious situations when the school head or any other school teacher is not around.

Custodians should be able to effect some preventive maintenance operations to protect the school buildings and grounds so as to avoid expensive maintenance at a later period. Custodians are in the school buildings every day and should be able to spot some minor problems on school facilities and promptly take care of them before the minor problems develop into bigger ones. Retightening a loose screw used to fasten a door key, for instance, can prevent the key from dropping off later and save the money that would have been required for a more elaborate maintenance work.

The custodial staff employed by the zonal office and deployed to schools should be under the dual control of the relevant zonal office administrator and the head teachers of the schools to which they have been posted. The school heads should supervise the functions of the custodial staff that must perform such functions to the satisfaction of the former.

Considerable care should be exercised in the selection of custodial staff on the basis of their demonstrated skills, knowledge and personal character at an interview. They should see themselves as having been selected on merit like other workers in the school rather than on basis of political patronage, sentiment or favouritism.

They should be subjected to the same rules and regulations that are operational in the schools where they are deployed. Their relationships with the teachers and other members of school staff as well as with pupils or students should be well defined. Their functions in their schools of deployment should be clearly defined to them. It is good practice to make them aware of all these during an orientation of the staff on arrival at their schools. Proper delineation of authority and responsibility among all school personnel is necessary in order to minimise conflicts among them. The head teacher should make it clear to school staff and students that the responsibility for keeping the school clean is a joint one between them and the custodial staff. Littering of school compound and the classrooms by children should attract sanctions.

The training needs of the custodial staff should be determined on regular basis by the custodial staff supervisor who should then arrange for such training opportunities either in the schools in which the custodial staff function or at the zonal level for many of them. The training may just consist of one or two days of instruction by a zonal office staff or, in the case of newly employed ones, by more experienced custodians among them. Capable ones among them should be given some training in record keeping and reporting. They should be able to keep records of weekly or monthly assignment of duties, the custodial equipment and materials in use and their assignment to each of them, as well as the kinds and amounts of materials and supplies used every week or month. Such records are useful for budgetary purposes and for ordering for materials and supplies.

SELF-ASSESSMENT EXERCISE

i. what is school plant operation?
ii. is there any need for custodial staff in public schools? Give reasons for your answer.

3.2 School Plant Utilisation

It is the duty of the school head to ensure that the school plant is ready for use when due and that it is correctly used for the purpose for which it is meant. This is necessary in order to prevent any disruption of the educational programme. We had earlier stated that using the school buildings and equipment in the right way prolongs their life spans and prevents avoidable damage.

Kochhar (1978) is right by stating that using the school plant for educational purposes requires careful direction or much of its effectiveness can be lost. If the design of a facility follows function, then the type of activity specified for the facility should be taking place in that facility. Otherwise, that facility is being incorrectly used.

Effective use of school buildings and classrooms needs careful planning and supervision. Effective use of school buildings involves the following:

- Ascertaining that each room in the building is used to its capacity. It will amount to under-utilisation if a classroom meant for 40 pupils is occupied by 20 pupils or less for most of the school year. On the other hand assigning 50 or more children to a classroom meant for 40 of them is tantamount to overcrowding which is educationally unadvisable.

- Ensuring that assignment of space reflects the best educational use of that space. Educational effectiveness in the use of space is not ensured by holding literature or history lessons in chemistry or biology laboratories, for instance. Nor is it educationally effective to hold English or biology lessons in the fine arts room. In each of the above-cited cases, there may be much distraction of students' attention when lessons are not conducted in the appropriate learning spaces.

- Ensuring that special rooms like music rooms, the science laboratories and fine arts rooms are used only for the study of the special subjects for which they were designed.

- Making sure that all non-instructional spaces are used for their intended purposes. When stores are used for purposes other than storing equipment, materials and supplies, the items meant for the stores may be put in places where they may easily be damaged or stolen. Unless adequate care is taken, it may take some time to locate some of the items when they are needed.

By studying the allocation of students to learning spaces as reflected on the school time table and armed with a good knowledge of student enrolment in each class, the school head can have an idea of how spaces are scheduled for use in the school. He can get better results by occasionally conducting space utilisation studies in the school. Following this, he can make such necessary amendments as will ensure the optimal use of spaces in the school.

As in the case of school buildings, the school head has to make sure that the available teaching aids in the school are optimally used to facilitate students' learning. It is not uncommon to find some useful audio-visuals, some scientific equipment and other materials in some school stores that have not been put into use for years. The reason for this may be either that the teachers do not know that such materials exist in the school, or they are not skilled at using them. In some cases the teachers may be aware of the availability of the materials, they may know how to use them but they may not be willing to use them. The school head teacher can encourage effective utilisation of school materials and equipment by:

- Producing and giving to every teacher, a list of the available special teaching equipment, materials and supplies in their respective subject areas and encouraging them to sign them out and make use of them regularly.

- Making them aware of any newly purchased equipment in the school and, if necessary, organising a workshop, demonstration or talk on how to use it for the relevant teachers.

- Undertaking some classroom visits from time to time to see whether and how they use the available school equipment.
- Complementing his observation with analysis of data on how such equipment are signed out by the teachers. This presupposes that such records are kept by the stores man or whoever is in charge of the equipment and materials.

It is often the case that some equipment and materials in some schools cannot be put into any use either because they are unserviceable or because of obsolescence. In such cases it may be advisable to sell them if there are any buyers. In the absence of any buyers, it may be better to give them out or dispose of them in any way possible instead of leaving them in the school store to occupy space. All these have to be done, however, with the approval of the appropriate Ministry of Education authorities.

The school head is also to make sure that adequate and effective use is made of the school playgrounds. The chances of the playgrounds being used are increased if the grass on them is kept low and if they are neat and free of all objects that can pose some danger to the children. Effective use of such spaces can be enhanced by scheduling both non-instructional and, if appropriate, instructional activities that will take place on them and making sure that the schedule is being adhered to.

In thinking about the effective use of school facilities, the head teacher should not forget the need of some of the facilities by the members of the school's local community. You should recall that we discussed in unit one of the first module, the different uses to which members of the community can put the school. The most common use is for social gatherings. The important point is that members of the community should not be denied the use of any school facility.

When such requests are made, the school head should make the conditions for the use of the facilities known to them. If many requests are made for the use of a particular facility, such requests should be entertained on first come, first served basis. Should such requests be regular from different groups in the community, it may be necessary for bookings for the facilities to be made with a designated school staff.

SELF-ASSESSMENT EXERCISE

i. Why should a school head teacher show concern about the use of the equipment and instructional materials in his school?
ii. Discuss the various ways in which a school head can enhance the use of appropriate teaching materials by teachers in his school.

4.0 CONCLUSION

The school plant is a costly investment- to the society, including the members of the local community. This investment must be protected by carefully and properly operating and using it. It is the responsibility of the school head to ensure that the facility is kept open for use and that it is kept neat and in good sanitary condition for the occupants. It is also his responsibility to ensure that they are optimally used to the advantage of the students, teachers, and the members of the local community. To perform these functions effectively the school head needs good planning and relevant studies.

5.0 SUMMARY

You learnt about school plant operation and utilisation in this unit. The meaning of school plant operation was explained and you must have

noted that careful operation and use of the school plant is desirable in order to prolong the useful life of the facility, among other reasons. You were given insight to some reasons why custodial staffs are not employed in our public schools even though the need for them exists. Following this was a brief discussion of the management of school plant operation programme. Finally, you learnt the ways in which a school can enhance the use of school buildings, equipment and grounds by school staff and students as well as the members of the local community.

6.0 TUTOR-MARKED ASSIGNMENT

1. What is school plant operation?
2. Discuss how you can establish an effective school plant operation programme in a local education area, pointing out the likely problems you may encounter in the process.

7.0 REFERENCES/FURTHER READING

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UNIT 2 SCHOOL PLANT MAINTENANCE

CONTENTS

1.0 INTRODUCTION

Depending on the availability of funds and size of the project, among some other factors, the planning, design, and construction of a school facility may take two to four years, but managing it lasts as long as the facility does. In unit 1, our focus was on two aspects of facility management: (1) organising the personnel and facilitating those activities they perform to keep the school buildings, furniture, equipment, and grounds tidy, neat and ready for use; and (2) effective utilisation of these aspects of the school plant for instructional and other purposes.

If the school custodians perform their duties diligently and regularly, not only will the occupants carry on with their own activities without let or hindrance but the functional life of the facility will be long. There comes a time, however, as the school plant is under use, that the state of some building materials, furnishings and equipment begin to deteriorate no matter how thorough and regular the housekeeping attention is given to it. When this starts to happen, the facility needs some maintenance.

This unit introduces you to school plant maintenance. You will learn the meaning and purpose of school plant maintenance, alternative ways of maintaining school facilities, how to organise a maintenance programme and the different types of maintenance that can be carried out on a school plant.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the meaning of school plant maintenance
- state why school maintenance is necessary
- describe how to organise an effective maintenance programme
- discuss the different kinds of maintenance.

3.0 MAIN CONTENT

3.1 Meaning and Purpose of School Plant Maintenance

You will recall that school plant operation has to do with those services or activities concerned with keeping the physical plant open and ready for use. Maintenance, on the other hand, connotes the idea that either something is wrong/is about to go wrong, or at least, not what it should be- in respect of a school building, furniture, equipment, or school ground and that something should be done to restore it to the normal condition. According to American Association of School administrators (1965), "maintenance involves those activities which are concerned with keeping grounds, buildings and equipment at their original condition of completeness of efficiency, either through repairs or by replacements." It involves repairs and replacements in order to ensure that the physical plant, equipment, grounds, and service facilities are continuously useable.

The essence of facility maintenance is to keep the plant functioning uninterruptedly in as near its original condition as possible. It seems obvious that the cost of doing this depends mainly on the initial planning and construction of the facility. The use of good quality building materials and competent workmanship during the construction stage most often attracts low maintenance costs.

The school plant is a costly investment in education. It takes a lot of time, material resources and efforts to set up one. It seems obvious that one of the important purposes of maintenance is to protect this investment. Another purpose is to protect the educational value of the plant. The educational value of the facility refers to its appearance, usefulness in housing the educational programme, and the learning

atmosphere that it creates. Maintenance of school facilities facilitates the delivery of effective and responsive services by school staff to students, community members and other people and agencies. Also among the purposes of school facility maintenance is to enhance the school's culture and image.

SELF-ASSESSMENT EXERCISE

i. Differentiate between maintenance and operation of a school plant.
ii. Why is the maintenance of a school plant important?

3.2 Approaches to School Plant Maintenance

There are basically three approaches to or plans of school maintenance that can be considered by school administrators: (1) the local system maintenance programme, (2) the contracted maintenance programme, or (3) a combination of these (Candoli, Hack, Ray and Stollar, 1973). The first approach involves each education authority operating its own system of maintenance. This system, according to them, prevents delays associated with the bidding and negotiation processes and saves some overhead costs which are charged by those performing the maintenance function. This approach reduces the delays associated with contracts. It also makes it possible for administrators to make efficient use of personnel in terms of scheduling peak-load and peak-time operations. Local system employees often provide higher standards of workmanship than the contractor working for a profit.

The problem with this approach, however, is that many maintenance functions require specialised type of procedure which may not be needed more than three times in the year and it may be too expensive for a local school system to employ people with the relevant skills. Another problem is that certain types of maintenance are associated with the use of specialised equipment or tools in combination with much specialised requirements in terms of physical structure or materials which are not associated with local school maintenance programme. In considering local-versus-contract services, it should be noted that while time may be saved at the bid phase of work by having local people perform the work, some costs related to equipment, depreciation of maintenance buildings, sick leave pay, etc., are not considered.

The second approach entails contracting out the maintenance work when due instead of employing staff that can be doing so. This is the approach that is widely adopted by most state educational systems in the country. This is usually the case, especially, when there is a natural disaster affecting a school building, when an emergency maintenance becomes

inevitable. The problem with this approach is that it is often costly and the contractor may not do high quality work.

SELF-ASSESSMENT EXERCISE

State the advantages and disadvantages of doing school maintenance work by contract.

3.3 Organising for Maintenance

There is no single way of organising for planned maintenance that will be suitable for every school system because educational systems differ in many respects. They differ with respect to geographical expanse, size of population, population density, wealth, etc. Regardless of the form of organization, however, there are some essential components of any maintenance programme. Some of these are discussed below.

3.3.1 Assignment of Responsibility

There must be someone in charge of every maintenance programme. Whoever is the head of the programme must be responsible to an appropriate official in either the Zonal Education Office or the Ministry of Education, depending on which body is in charge of the overall programme. For effectiveness of the programme, the overall responsibility should be on the zonal education offices as they are closer to the schools.

The person in charge must work with some people whose number will be determined by the maintenance needs of the schools in the zone and the size of the budget. In big school systems where maintenance personnel can be employed on full-time basis, their number and type will be determined by the size of the budget and types of common maintenance problems in the schools in the Education Zone. Where the school number is too small to justify the employment of even one full-time maintenance worker, provision should be made on a regular basis for money to hire the services of contractors. In such a situation, the person in charge will be dealing with the contractors as the needs arise.

3.3.2 Study of Needs

As already mentioned above, whether or not maintenance personnel will be employed in a school system should be determined by whether or not there is need for them. This can only be determined by an objective study of the maintenance needs of the school system which seeks answers to the following questions: what are the common maintenance problems encountered by schools in this education zone? What types of

skilled labour are required to handle such problems? Which of the skilled labourers can be fully engaged throughout the year within the limits of the available funds and which of them are needed only occasionally to perform some maintenance jobs? Depending on the amount and types of maintenance problems encountered by the schools in the zone, the study should be able to reveal the skilled and semi-skilled workers to employ full time and the types to be hired whenever their services are needed. The major problem with employing full-time maintenance staff is with retaining them, if their salaries are not attractive enough.

3.3.3 On–the-Job Training

It may not be possible to attract sufficient number of skilled workers to take up maintenance jobs in schools. It may not be possible to retain the employed ones probably because of low salaries and low job satisfaction. In such circumstances, it may pay off to hire both skilled and untrained workers in a particular trade or craft, e.g. carpentry, plumbing, etc., so that the untrained ones will be apprenticed to the skilled ones. The apprentices, after an adequate period of learning under the skilled craftsmen should be encouraged to take the appropriate trade examinations and the successful ones should be regarded and given pay increases.

In situations where there may be no master craftsman to learn from, it should be possible for the person in charge of the programme to organise relevant on-the-job training for the unskilled employees. Inviting suitable resource persons to some regular one or two-day workshops organised for unskilled workers in the education zone in different trades is one of the ways of accomplishing this. The success of this approach depends on the quality of supervision of the work of the employees, the ability of the supervisor to detect their skill needs, and the competence of the resource people invited to the short training programmes or workshops.

3.3.4 Identifying Maintenance Problems

One of the major duties of the maintenance staff- including their supervisor is the detection of plant maintenance problems. Performing this duty well requires a systematic plan for inspecting the school plants in the zone. The first step in developing such a plan is a systematic survey of the existing school plants. Such a survey is technical in nature and will require the services of architects and engineers. The results of this survey should provide the basis for developing an effective maintenance schedule and a checklist for regular inspections. Each

building in each school will require an individualised checklist because of the differences in their ages, structure, design, and service systems.
Three major problems deserve attention in any programme of inspection; they are as listed below.

(1) Those elements on which the safety of the occupants of the building depends

The items in this category include fire extinguisher, fire alarms, emergency doors and exit lights. Special attention should be paid to these items by preparing a separate checklist with which they could be inspected on a daily, weekly and monthly basis.

(2) Surfaces that are exposed to weather

Surfaces that are exposed to moisture should be regularly inspected and must, as much as possible, be protected from the effects of weather elements.

(3) Moving parts of mechanical equipment

All moving parts of mechanical equipment need to be greased or oiled from time to time. The manufacturers' manuals accompanying the machines or vehicles should provide adequate instructions for this purpose and should be thoroughly studied and preserved.

A well organised inspection report provides a good basis for planning and scheduling maintenance work. Following the inspection report, an order of priority for all repair works should be scheduled with the highest priority given to the items that affect the safety, health and security of the occupants. Next in the order of priority are those items which, if left unattended to, will shorten the life of the building or lead to more extensive repairs. Other items may now be listed after these two categories.

3.3.5 A Maintenance Budget

The successful operation of a maintenance programme depends, primarily, on the availability of funds. It is in this regard that Nigerian school systems fall short of expectation. The poor condition of most of our school buildings and equipment can be traced to the fact that no provision is usually made in federal and state budgets for the maintenance of school plants.

A good estimate of the annual provision for school maintenance can be obtained by keeping a detailed record of maintenance costs over a period

of years followed up with systematic inspections. An average cost can be arrived at and form part of the basis for annual budget estimates. It should be borne in mind, however, that this average reflects the past and should accordingly be adjusted for inflation. It should also be noted that the rate of deterioration of the equipment increases with age. An alternative approach is to set aside a fixed percentage of the annual budget for education for maintenance purposes.

3.3.6 Purchasing Procedure

Meeting the maintenance needs of the school plants in an education zone may require a lot of material resources. An effective purchasing system is an essential component of a good maintenance programme. Informed decisions about which items to purchase in bulk and which ones to purchase only when the need for them arises can only be made after a thorough study of the maintenance needs of the school system. The objective of establishing a purchase system is to obtain the proper amount and quality of materials at the lowest possible cost and to make them available at the right place at the right time. If it becomes necessary to purchase large quantities of some particular items, considerable thought should be given to the warehousing and security of the items. The costs of warehousing and employing a store keeper and retaining his services should be viewed against the size of the budget available for maintenance services every year.

SELF-ASSESSMENT EXERCISE

i. List and describe four essential components of a good school plant maintenance programme.
ii. Describe how you can identify the personnel needs of a school maintenance programme.

3.4 Types of Maintenance Services

Effectiveness and efficiency of a maintenance programme are achieved if the maintenance of the school plant is scheduled, instead of only responding to emergencies. This means planning the programme in such a way that some maintenance services are performed on a regular basis, some periodically and others can be as the need arises. Based on this, some writers distinguish five types of maintenance services in some programmes – preventive, periodic, replacement, emergency, and improvement maintenance. Other writers, however, recognise only four types of maintenance, arguing that there is much overlap between improvement maintenance and the other types of maintenance. Moreover, some improvement ‘maintenance’ services especially those

being performed for the first time, may constitute capital improvement. The four common types will be discussed in this unit.

3.4.1 Preventive Maintenance

This type of maintenance, as the name implies, is the service rendered on school buildings, equipment and furniture in order to prevent malfunctioning of an equipment, or early deterioration of buildings, parts of buildings, furniture and equipment in order to maximise their useful life. Candoli (1988) defines this type of maintenance as "that programme for servicing machines, systems and structures devised to prevent a breakdown of the system or one of its components." Preventive maintenance protects buildings, grounds, furniture and equipment in order to avoid expensive maintenance. As already pointed out in the last unit, preventive maintenance is often carried out by custodial staff. Their performance of this task may be enhanced by on-the-job training.

Preventive maintenance is rarely practised in Nigerian public schools most of which do not even have the custodial staff to render such services. Absence of any type of maintenance programme and school inspection schedule in schools also hinders the rendering of such maintenance services.

3.4.2 Periodic Maintenance

This is the type of work done at regular intervals-yearly or two-year intervals or more. It is most often done on contract basis, at predetermined times. It is the type of work associated with the servicing of office, laboratory, and other equipment in the school periodically. This type of maintenance also includes such work as painting and repair of leaking roofs which can be scheduled to take place periodically as buildings continue to age.

3.4.3 Replacement Maintenance

This type of maintenance involves removing and replacing an equipment or parts of it when due. Some machine and vehicle parts and some plumbing fixtures, for instance, need to be replaced before they become so bad that the item breaks down. It is poor practice to wait until an item of equipment or machine becomes completely unusable before replacing it. Regular replacement of an item of equipment or some of its parts prevents occasional embarrassment. It also prevents unbudgeted expenses during the school year.

3.4.4 Emergency Maintenance

No matter how well a maintenance programme is planned and adhered to, there will always be some unforeseen or unexpected emergencies. This type of maintenance is the work done when a system, an equipment, especially one that is frequently in use, unexpectedly breaks down. It is also the type of work done when a part of a building collapses because of a natural disaster and other reasons. This type of maintenance is the most common in Nigerian schools. Some of the emergency maintenance works could, perhaps, be avoided if there were operational maintenance programmes in the school systems.

In cases of emergency, the first concern should be with the safety and health of the occupants of the facility involved. They need to be promptly evacuated and settled elsewhere. All school staff and students should be given adequate instruction on what to do and what not to do in emergency situations and when emergency repairs are being done in the school.

SELF-ASSESSMENT EXERCISE

i. What is preventive maintenance? Why is it important?
ii. Distinguish between periodic and replacement maintenance, commenting on the advantages of each type of maintenance in school plant management.

4.0 CONCLUSION

Different types of maintenance serve different purposes in school plant management. They are all necessary for keeping the school plant in as near its original state as possible. Regardless of the nature of the maintenance programme and the amount of care exercised in executing it, the need for emergency maintenance may come up at any time due to unforeseen circumstances.

5.0 SUMMARY

In this unit, you learnt four types of maintenance services designed for school plants, namely – preventive maintenance designed to prolong the functional life of a facility or delay its extensive maintenance; periodic maintenance done at specified periods often by contract work; replacement maintenance to replace an item or part of it before it becomes totally unusable; and emergency maintenance which can come up at any time due to unforeseen circumstances.

6.0 TUTOR-MARKED ASSIGNMENT

Discuss the advantages of any three named type of maintenance in school plant management.

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UNIT 3 PROMOTING SCHOOL PLANT MAINTENANCE CULTURE

CONTENTS

10. INTRODUCTION

As earlier mentioned in the course of this study, for the society, the school plant represents a big investment in education. You learnt, in the last unit, that it is important to protect this investment. You also learnt about the different types of maintenance services needed to preserve the school plant in as near its original state as possible. Its functional life will be prolonged and, perhaps, the regularity of some types of work done to preserve it reduced if all the occupants of the school plant develop good maintenance culture.

In this unit, you will learn the meaning of culture and the concept of school maintenance culture. The determinants of school culture and the roles of a school head in reshaping the school culture and of the school staff and students in ensuring adequate maintenance of the school plant will also be addressed.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- state the meanings of culture and school culture
- explain school maintenance culture
- highlight the determinants of school maintenance culture
- discuss how school heads can shape school maintenance culture

- describe the roles of school staff and students in promoting school maintenance culture.

3.0 MAIN CONTENT

3.1 The Concept of School Culture

Culture is one of those concepts that have no precise definition. It has an anthropological basis and is used in reference to a group of people or organisations and focuses on the meaning and character of their life. The importance of the culture of a work group date as far back as the early 1930s and 1940s; at that time, Elton Mayo and Chester Barnard stressed the importance of group norms, sentiments, values and emergent interactions in the work place, as they described the nature and functions of informal organisations.

3.1.1 Definitions of Culture

Definitions of the concept "culture' are not lacking in literature but there is no agreement among writers on its meaning as the following definitions by a few of the authors show. "Culture is the shared knowledge and schemes created by a set of people for perceiving, interpreting, expressing, and responding to social realities around them," (Lederach, 1995: 9). According to Damen (1987) culture has to do with "learned and shared human patterns or models for living, day-to-day living patterns; these patterns and models pervade all aspects of human social interaction. Culture is mankind's primary adaptive mechanism." According to Hofstede (1984: 51), "culture is the collective programming of the mind which distinguishes the members of one category of people from another." Griffin (2003) in his own definition of the term states that "…culture refers to the collection of values, beliefs, behaviours, customs, and attitudes that characterise a community of people" (p. 51).

Most of these definitions justify the observation that culture, generally, refers to a group of people and their ways of living. It involves their shared norms, values, beliefs, attitudes, assumptions and ideologies. It is a concept that helps to explain the behaviour of individuals and groups. It is the foundation of any organisation's internal environment. According to Griffin (2003), it determines the 'feel' of the organisation, regardless of its nature; it is a powerful force that can shape the firm's overall effectiveness and long-term success.

3.1.2 The Culture of a School

The school is a formal organisation made up of teachers and other school staff, the head teacher, and students. They all form a group of people in constant interaction, on a daily basis. These interactions, which cover every aspect of school life, are usually based on existing acceptable standards of behaviour, the values of the group members, and their beliefs and assumptions about school and other aspects of life. All these constitute the culture of the school which is a major determinant of how its members behave in that school and, in many cases, elsewhere.

Rules and regulations are formulated by the members of the school to ensure compliance with behavioural norms. Acceptable standards of behaviour are rewarded in one way or the other while unacceptable ones receive appropriate sanctions. The school culture persists over time unless there is a reason to change some aspects of it; but even if there is any good reason to change any aspect of it, it is often a difficult task doing so.

3.1.3 Determinants of School Culture

While it is difficult to specify from where or when the culture of a school started, it is less difficult to identify what determines and sustains it. Under normal circumstance, culture develops and flourishes over a long period of time. In regard to its origin, the culture of a particular school can safely be assumed to have started from the moment the school plant was put into use or occupied by the first set of school staff and students. A founding head teacher has much influence on the development of the culture of the school. The policies or guiding principles, rules and regulations, procedures, etc., established by the founding school head and his staff members, set the pace in the development of school culture. His pronouncements, leadership style, demonstrated concerns about certain aspects of school life, have no less impact on the school's culture.

The symbols through which the school culture is expressed also play a great role in sustaining the culture of a school. According to Firestone and Wilson (1985), the three symbols which communicate the content of a school's culture are stories, icons, and rituals. Stories are narratives that are based in true events and, at times, fictions. Some of the stories may be myths or legends. The stories that have much impact on school culture are those that are based on true events within the school's setting.

Icons are artifacts that are used to express culture. They include logos, mottos, and trophies. Making explicit the school's philosophy about any

aspects of the school or school life and making it available to students and staff, visitors to the school including the local community members and agencies, is a way of communicating the school culture. The communication can be accomplished through news bulletins, bulletin boards and other forms of communication.

3.1.4 School Culture and School Plant Maintenance

The extent to which members of a school value and take care of the school plant is determined by their beliefs about the worth and significance of the school plant. Their general attitude towards the maintenance of the school plant, in turn, determines to some extent, the efficiency in the use, and effectiveness of the school plant in supporting the academic programme and satisfying the needs of the users including the members of the local community.

In the same way that a school head influences the school culture, so also can he influence their attitudes towards the school plant and its maintenance and operation. His attitudes, pronouncements about the care for school plant and the promptitude, or otherwise, with which he pays attention to school plant maintenance issues, and his discussions and manner of involvement of staff and students on matters concerning the school plant, influence the attitudes, beliefs and values of his subordinates and the student body.

Stories about true events and incidents in connection with the school plant also influence the attitudes and behaviour towards the school plant. Stories about sanctions on students who damage school property or deface the wall of the school buildings, about the prompt action taken by the school head to repair damaged school buildings provide insight into the value placed on maintenance of the school.

Icons and rituals are important not only for communicating but also for sustaining prevailing attitudes towards the maintenance of the school plant. Putting in writing, a brief statement of the school's philosophy about keeping the school neat and in functional form influences the behaviour of school people and even visitors towards school property. The same impact is made by the use of rituals or routine ceremonies by the school authority to appreciate the efforts of groups and individuals in maintaining the beauty and attractiveness of the school plant.

When and if all these measures make the occupants of a school's buildings develop and internalise consistent and predictable attitudes and behaviour towards the care of the school plant, school maintenance culture is said to be existent in the school. A school's maintenance

culture can be either positive- portraying a consistently caring behaviour by its members, or negative, portraying a non-caring attitude.

SELF -ASSESSMENT EXERCISE

i. Explain the term 'school culture.'
ii. What is school maintenance culture?
iii. What do the occupants of a school plant gain from having a positive school maintenance culture?

3.2 School Maintenance Culture in Nigeria

Based on the observations of most writers on school plant maintenance in the country, the current maintenance culture in almost all the Nigerian public schools can best be described as negative. Recent comments and observations on this issue may be instructive. Ehiametalor (2001), for instance, observes that billions of naira have been spent on the construction of school buildings, purchase of equipment, machinery and furniture to enhance teaching and learning but very little thought has ever been given to maintenance.

According to him, school facilities are considered to have a perpetual life span, irrespective of the vagaries of weather, and natural disaster. The Education Sector Support Programme in Nigeria (ESSPIN, 2009) makes this observation on the condition of the existing school buildings, "even where 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 thus having a reduced lifespan."

The neglect of school plant maintenance by educational administrators and policy makers is also applicable to the school plant administrators, school staff and students to some extent. There have been no conscious efforts by either the educational administrators or school staff to start any building improvement programme nor has it been heard that any group of staff and students have been sensitised on the need for maintaining school plants. In most schools in the country there are no known standards in regard to school plant operation and maintenance.

There are a few, if any icons, and observed rituals in the schools to reinforce or sustain a good maintenance culture. As noted in Unit 1 of this module, a typical classroom in our public school is not well cared for, while some walls of the school buildings may be defaced with graffiti. All these are indications of negative school maintenance culture. A real challenge to educational administrators and school heads, school staff and students is to change from a negative school maintenance

culture to a positive one. In other words, the existing maintenance culture in our public schools needs to be reshaped in order to make our school plants function more efficiently and effectively and also have extended lifespan.

SELF-ASSESSMENT EXERCISE

What is school maintenance culture? Comment on the maintenance culture of any named school that you know.

3.3 Reshaping School Plant Maintenance Culture in Nigeria

The task involved in reshaping the existing poor or negative school plant maintenance culture in our public schools is a daunting one. Initiating and developing positive school maintenance culture in the schools requires the cooperation and joint efforts of school administrators, educational policy makers, school staff and students as well as other stakeholders in education. The onus for reshaping the current negative maintenance culture or, in other words, promoting a positive or healthy one, rests mainly with the head teachers. Any meaningful attempt at changing it to a positive one should start with the head teachers understanding the maintenance culture in their schools and deciding which aspects of it need to be changed and which ones to retain. By studying and understanding the present culture, and being convinced that there is a need for change they should be able to take appropriate actions.

Some of the actions that can be taken by a school head to initiate and promote positive maintenance culture in his school include, but are not limited to the following:

- Establishing a school maintenance programme together with his school staff and the students.

- Assigning the responsibility for the care of school flower hedges, school grounds, lawns and other structures in the school to specific classes, under the supervision of either the class captains or their class teachers. In order to develop a caring culture, the students should have something to take care of.

- Making regular inspection of the school buildings and other structures with the vice-principals to ascertain the conditions of the facilities, recording their observations and taking measures to report any identified fault promptly to the Ministry of Education. By so doing, school members will know that he shows concern for the facilities.

- Occasionally walking into classrooms to ensure that they have been swept and kept tidy.

- Consistently applying appropriate sanctions against student behaviours that show lack of care for school property and school buildings, such as defacing the walls with graffiti, carelessly breaking window or door glass panes and dropping litter on school lawns and corridors of school buildings.

- Instituting prizes and trophies to be competed for among students for keeping classrooms, workshops and other school structures neat and tidy.

- Ensuring that some songs that emphasise the care for school facilities are composed and taught to the children.

- Using mottos, slogans, symbols and banners to sensitise the students, staff and visitors on the need to take care of lawns, and preserve the beauty of the school environment, etc.

- Rewarding and celebrating behaviours that are consistent with keeping the compound in good order. If, for instance, a student draws the attention of the school head or a school teacher to places that need attention in a school building, his/her effort should be acknowledged and the attention of the other students drawn to it.

- Promptly reporting any damage to the school buildings and structures to the appropriate quarters and following it up if need be. Soliciting the assistance of the local community members may pay off well as attention by the Ministry of Education may be late in coming.

Regardless of the efforts of the school heads, staff, and students, in caring for school plants, there is a limit to the types of maintenance work they can do on any school plant. They will not be able to carry out real maintenance work in the school for lack of relevant skills and funds. The efforts of the school heads will only be meaningful if the state and federal governments can formulate appropriate policies on school plant maintenance in our public schools.

The policies should provide for a certain amount of money or a certain percentage of the budget for education to be set aside for purposes of school maintenance and operation. Until the governments are ready and able to employ competent maintenance crew in our school systems, it is suggested that school inspectors be made to observe and report

meaningfully on the conditions of the facilities in which teaching and learning take place. Such reports should be followed up with prompt action from the Ministry of Education, Zonal or Local Education Offices.

SELF-ASSESSMENT EXERCISE

What roles can be played by (i) students, and (ii) teachers in promoting good school maintenance culture in Nigerian public secondary schools?

4.0 CONCLUSION

It is desirable for the occupants of school facilities to develop and sustain good maintenance culture. Good maintenance culture ensures that a school plant is well taken care of and can be utilised more effectively and efficiently. The existence of good maintenance culture among the occupants also prolongs the lifespan of the school plant. It is the duty of the school head to inculcate good maintenance culture in his staff and students.

In order to have intended impact, the State and Federal governments should formulate policies aimed at addressing the maintenance need of our public schools. In addition to this, adequate funds should be made available for attending to the maintenance needs of the schools and the relevant maintenance crew should be employed to render the necessary services.

5.0 SUMMARY

In this unit, you were introduced to the concept of culture. You were made aware of the fact that there are many definitions of the term and there is no consensus on the precise meaning of the concept. Following this, you learnt about the concept of school culture and its determinants. You must have noted the role that can be played by the school head teacher in developing and sustaining the school culture. Next, you learnt about school maintenance culture and the various ways of communicating the school maintenance culture.

The existing maintenance culture in Nigerian public schools was discussed and the need for a change of general attitudes towards school maintenance was indicated. Finally, the possible roles of school heads and governments towards promoting good school maintenance culture were highlighted.

6.0 TUTOR-MARKED ASSIGNMENT

What is school maintenance culture?

Discuss the roles of (i) school head teachers, and (ii) the government in reshaping the maintenance culture of our public schools.

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