UNIVERSITY OF EDUCATION, WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION KUMASI

AN ASSESSMENT OF THE MAINTENANCE CULTURE OF GOVERNMENT VEHICLES IN SENIOR HIGH SCHOOLS IN THE AKIM-ODA MUNICIPAL ASSEMBLY IN THE EASTERN REGION OF GHANA

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JANUARY 2014

DECLARATION

STUDENT'S DECLARATION

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

SIGNATURE: ……

DATE: ……

SUPERVISOR'S DECLARATION

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

NAME OF SUPERVISOR: Mr. Stephen Amoakohene

SIGNATURE: ……

DATE: ……

DEDICATION

This Dissertation is dedicated to my lovely wife **MRS.MAVIS DZINEKU**

ACKNOWLEDGEMENT

To God I give all the glory for making it possible for me to successfully complete this Dissertation. May his name be praised forever. My sincere thanks go to my lecturer and supervisor Mr. StephenAmoakohene for his constructive criticisms, suggestions and guidelines for making this work a great success. I also say a big thanks to my respondents in all the Senior High Schools within the Akim-Oda municipality especially Madam Ablata M. Ansah the Headmistress of Akroso Senior High School. God bless you all. AMEN

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ABSTRACT

The main aim of this study was to explore the challenges in maintaining Government Vehicles in Senior High Schools. Basically, the research examined the maintenance culture of Government Vehicles in Senior High Schools in the Akim –Oda Municipal Assembly in the Eastern Region. A survey was conducted with a sample size of forty (40) mainly Headmasters, Assistant Headmasters and school drivers. The research design that was used in the study is a descriptive survey and document analysis. These were positively used to cater for the analysis of both quantitative and qualitative data. Major findings are that maintenance of Government Vehicles in Senior High Schools is faced with numerous challenges ranging from Finance, Maintenance Management and Administration. Also the attitude of some school drivers towards maintenance is verypoor. Maintenance Policies and Plans exist in the schools but their implementation, monitoring and supervision is a problem due to financial constraint. It was identified that the schools do not have a formalised maintenance department to effectively over see maintenance activities. Finally, most of the schools have difficulties in taking their vehicles to companies that supplied them for servicing, coupled with high charges which deter school management from doing so. Instead they fall on road side mechanics that eventually compound their problems. It is therefore recommended that a formalised maintenance department should be setup in the schools to allow for the decentralisation of maintenance issues.

CHAPTER ONE

INTRODUCTION

This first chapter deals with the general overview of the study which includes the background of the study, statement of the problem, purpose of the study, research questions, and significance of the study as well as the organisation of the study.

1.1 Background of the Study

Maintenance culture has been recognised as an important aspect to increase the quality of maintenance work. Despite being unique to each organisation, culture within organizations needs to evolve to suite the ever changing market demands and trends. The cultivation of maintenance culture should commence with the change of mindsets and attitudes to promote continuous knowledge and skill enhancement, and performance improvement in maintenance activities. Cultural change needs to break indigenous moulds of poor perception, old patterns of now inappropriate behavior, and outdated beliefs and values.

Though studies pertaining to culture are abundant in business and manufacturing sectors, little effort has been put to study culture in the educational sector, particularly in maintenance. Maintenance work has not been studied much from the cultural perspective and former approaches have seldom taken into account the demands of the maintenance work in the entire organisation. Maintenance culture is important to elevate maintenance performance which would directly lead to enhanced facilities performance. It is an alternative for improving maintenance commitment and creating maintenance awareness among all parties in maintenance management.

The development of every school depends greatly on its infrastructural development which includes Buildings, Vehicles, Workshops, Laboratories, Libraries, and Laboratory equipment. For these infrastructures to stand the test of time and to perform their intended functions to contribute

to the development of the School there must be the culture of maintenance. Vehicle maintenance in our schools is so essential that it cannot be over looked. Since this can endanger the lives of staff, teachers and students.

Maintenance is a work carried out in order to keep or restore a facility such as machinery or equipment to an acceptable standard. Without proper and regular maintenance of resources, there can be stoppage or loss in production which could greatly affect the profit or gains of an institution or organisation.

In public service such as schools the customer is paying for a service which includes transport and other services, and a break-down of these services may not only affect production or cause financial loss but will also cause inconveniences which eventually reflect on the reputation of the establishment. According to the Federal Road Safety Corps of Nigeria (2011), Poor Maintenance Culture among vehicle owners is the cause of road crashes during festive season.

Maintenance is very important to organisations today. Maintenance is necessary not only to maintain function of the vehicle, hence to minimize maintenance costs and to ensure a safe environment to vehicle occupant. The issue of maintenance is often highlighted in the educational sector with respect to weaknesses in managing the maintenance of particular types of vehicles. This item is associated with lack of management commitment by the maintenance group for dexterous and responsive maintenance work. The problems occur because of low quality of maintenance work, lack of ethics in maintenance effectiveness, ignorance to understand maintenance work, inexperienced and unskilled workers and manpower, lack of supervision from leaders, delays in repairing and replacing asset, failure of the management to provide clear

policies and standards to guide the maintenance staffs, insufficient information of maintenance, and lack of commitment to maintenance plan (Onohaebi, 2010).

According to George Rechnitzer (2000), studies of crushed vehicles have shown that poor maintenance contribute directly or substantially from around 3% to 19% with common defects identified relating to brake and tyres.

Hence vehicle maintenance is becoming a national issue considering the spate of carnage on our roads. This has challenged the researcher to assess the maintenance culture of government vehicles in Senior High Schools in the Birim Central Municipality.

1.2 Statement of the Problem

A visit to a number of Senior High Schools in the Birim Central Municipality reveals that government vehicles in most of these Schools are broken down. Some are sitting on stones and left at the mercy of the weather. This phenomenon has questioned the maintenance culture of government vehicles in the various Schools. In the event of injuries and casualties during inter-Houses sports and games, it becomes very difficult to transport victims to the hospital. At night when students fall sick there are no functional vehicles to send them to the hospital.

It is a fact that almost every Senior High School in Ghana has a vehicle which is used by Teachers, and management for running the day to day affairs of the schools as well as for conveying students on field trips.

It can therefore be deduced from the background that poor maintenance of vehicles is a major cause of frequent breakdowns leading to accident on our roads. It is upon this accession that this research seeks to assess the maintenance culture of government vehicles in Senior High Schools.

1.3 Purpose of the Study

The principal aim of this research is to find out how government vehicles in Senior High Schools in the Birim Central Municipality are maintained.

1.4 Objectives

The Specific Objectives of this research are to:

1. Identify the maintenance practices in the schools.
2. Find out if the correct practices are being followed.
3. Find out how maintenance is financed in the schools.
4. Identify problems and challenges as far as maintenance of vehicles is concerned.
5. Suggest possible measures to minimize the problems that militate against the maintenance of government vehicles.

1.5 Research Questions

These questions cropped up after analyzing the problem.

i. What are the maintenance practices in the schools

ii. How are maintenance issues handled in the schools

iii. What are the challenges militating against the Maintenance of government vehicles.

1.6 Significance of the Study

The study seeks to inform the Birim Central Municipal Directorate of Education and other municipalities about the maintenance culture in our schools and also its corresponding effects on the social life of the school committee. The study will also be beneficial to Government and all stakeholders connected to education.

Furthermore, the study will be beneficial to Non-Governmental Organizations who support infrastructure development in our schools. Lastly the study will provide empirical information on maintenance culture in our schools.

1.7 Organisation of the Study

This research report is organized into six chapters. This first chapter deals with the background of the study, statement of the problem, purpose of the study, research questions, and significance of the study and the organization of the study. The review of the relevant literature on the study is in chapter two. Chapter three deals with the methodology which consist of the design of the study, population, sample and sampling techniques used instrumentation and data collection procedures including procedures for analysing the data. The chapter four presents the analysis of the data. The last chapters talks about the discussions of the findings, recommendations and conclusions of the study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

Maintenance culture as an attitude cannot be over emphasized in the Ghanaian society. Hence the Government and other agencies continue to preach the gospel of good maintenance culture. The review of the literature will cover:

1. The concept of maintenance
2. The concept of culture
3. The role of culture in maintenance
4. Cultural change
5. Maintenance application and management
6. Maintenance Strategies

2.1 Concept of Maintenance

Maintenance can be viewed from a different perspective; this is based on the objectives of maintenance. The universal definition for maintenance is based on minimum principle of conservation and long life cycle on structure, systems and equipment. The structure refers to something constructed such as building; the system consists of the components installed on the equipment and structure such as civil system, mechanical system and electrical equipment. Equipment is a tangible property besides land and building that used in operations of a business thus; it is referred to devices, machines, tools and vehicles. Therefore, all these items are tangible asset and have a life cycle that is required to be maintained and protected properly. The word maintenance is a noun derived from the verb "to maintain" that mean process of keeping something in good condition (Telang and Telang, 2010). The process of maintenance involved

task or activities to restore the equipment in its normal operating condition, at minimum cost throughout their life cycle.

According to British Standard 3811:1984, maintenance is defined as a combination of all technical, administrative and managerial actions during the life cycle of an item intended to retain it in, or to restore it to a state in which it can perform the required function (Wordsworth, 2001). A combination of any action consisted of technical, administrative and managerial that cooperates with each other in maintenance work. While „to retain" and „to restore" this item is a process of work carried out in anticipation of failure (retain) and work carried out after failure (restore). Meanwhile, the required function or acceptable condition is referred to the acceptability of the person who is paying for the work to the person receiving benefit or to some outside body with responsibility for enforcing minimum standards (Wordsworth, 2001). In other words, maintenance is defined as an action carried out by a group of person to protect, preserve and maintain the systems, equipment and structures to ensure the asset is capable to function effectively. Ahmad Ramly (2002) stated that the aims of maintenance from Automobile perspective are:-

1. Increase the maximum benefit, especially to owners.
2. Get maximum performance at a lower cost, especially public owned vehicles
3. Provide comfort and peace building, especially to vehicle occupants.

Nowadays maintenance as an activity (work process) is important in each organisation because it support the business performance of the organization to ensure the structure, system and equipment are in good condition. Maintenance is a complex activity, it involve social technical system that define the management. Management is acknowledged as people that control and making decision in a business, the concept management in maintenance is the organisation of

maintenance within agreed policy. The organization of maintenance describe the persons responsible for planning may be under taken by a member staff in addition to his other duties, while in a large firm there would usually be separate group of people solely responsible for maintenance (Wordsworth, 2010).

The responsibility of maintenance reflect all the activities of the management that determine the maintenance objectives or priorities (defined as targets assigned and accepted by the management and department),strategies (defined as a management method in order to achieve maintenance objective) and responsibilities and implement them by means such as maintenance planning, maintenance control and supervision and several improving methods including economy aspects in the organization (Telang and Telang, 2010).

In the context of automobile industry, the maintenance management is an organization that is considering the work of maintaining a vehicle within the contract that has been agreed between two parties whether by vehicle owner, contractor and maintenance management department or company. All the parties involved in the maintenance management carry out works and followed the maintenance contract as their guidelines. To conclude, maintenance is defined as an action carried out by a group of individuals to protect, preserve and maintain systems, equipment and structures to ensure the functional capability of asset.

2.2 Concept of Culture

Culture is difficult to define because it has multitude dimensions, each with own slight variation depending on the focus of study. According to the advance learner‟s dictionary, culture is way of life which consists of language, arts and thought, spiritually, social activity and interaction. Generally, culture is an inherited ideas, beliefs, values and knowledge that contribute the shared bases of social actions (Schein 1999; Morgan 1986).

Culture is the key that influences behaviour of getting things done the right way without which would hinder the goals from being achieved (Brendan, 2006).

Culture is shaped by the interaction between individual and groups shared the value, perception and goal they have learned from previous generation continues to another generation. The context of culture has been use in organisation when culture is created in the organisation of social relationship among members through way thinking, behavior and belief.

According to Gareth Mongan (2002) culture is a social and collective phenomenon which refers to the ideas and values of social group and is influencing their action without noticing it explicitly. According to him, the cultural elements are value, knowledge, beliefs, legislation and rituals. Another researcher Gerent Hofstede (1991) defines culture as a mental coding which allows acting coherently.

In general, culture is defined as the overall activity of human behaviour, the arts, belief, values attitudes, practices and all human works and ideas that influences each member in the organisation.

2.3 Role of Culture in Maintenance

Culture of Maintenance is important to elevate maintenance performance which would directly lead to enhanced facilities performance. It is an alternative for improving maintenance commitment and creating maintenance awareness among all parties in maintenance management. Culture is not something that can be described only by the treatment and the actions of each member of the group interact with one another. These actions and behaviours relate to the things to do and what we want to achieve for an organisation (Diaz Cabrera *et. al*, 2003). Therefore culture is an important element of acting in creating individual behaviour and then transmits it to the whole group or organisation. It has also been referred as the conventional way of how the group members think and act, understand and appreciate the reality and indentify problem solving in organisations. The aim of developing maintenance culture is to build general awareness of importance of maintenance concerning maintenance work.

The definition of maintenance culture has not been described in detail by the literature studies. However, the scope of the definition has similarities with the culture in other fields. The concept of maintenance culture is the internal environment between management and staff in managing maintenance effectively through the sharing of ideas, beliefs and values for each member in organisation (Mark *et. al*, 2006)

Maintenance culture is a way of thinking and behavior that can be drawn based on the actions taken by each individual in maintaining, preserving and protecting a system, equipment and structures. Cultural beliefs, values, norms, practices and attitudes related to maintenance work should be embedded in every individual organisation carrying out maintenance services

(Suwaibatul, 2010). Process created maintenance culture by promoting maintenance-related activities based on human resource development.

2.4 Cultural Change

The process of cultural development is indeed difficult and requires a long time to be implemented, but it is not impossible to implement (Robbins and Coulter, 2005). Culture is an important asset in the organisation since it formed the successful activities of the organization and be able to make the organisation competitive, thereby making the organisation a culture of value (Schein, 2004).

Similarly, the culture of maintenance should be applied to all members of the organisation in implementing proper maintenance. Many researchers believe the process of cultural development based on changes in organisational culture. The traditional cultural need has changed to break indigenous moulds of poor perception, old patterns of now inappropriate behavior and previous but now outdated, beliefs and values (Paschal, 1992). Organisational culture is the change needed to bring a new culture in the activities of the organization to practice by the entire members in organization. (Ogbonna and Wilkinson, 2003, Schein, 2004 and Daft, 2007). This matter because culture is not something that exist naturally, it should be educated and develop stage by stage (Mohd Saidin, 2009).

According to Mohd Saidin (2009) culture change is a process that consists of two elements, namely changes in behaviour and work practices to develop a culture within an organisation. However, behavioural change needs to be done before making changes to work practices (Ogbonna and Wilkinson 2003). In the context of maintenance of organisational culture, change

needs to be done to develop a culture of maintenance based on changes in behaviour, values, beliefs and thoughts that have been embedded in each individual.

Maintenance of cultural development based on changes in organisational culture from the perspective of individuals and groups involved in maintenance work. This is because maintenance is most important activities that must be undertaken to ensure that facilities or assets are properly maintained. Everyone must play their part in the organisational culture to ensure correct understanding of the need to effectively perform maintenance and changing the attitudes and behaviour through the intrinsic and extrinsic element in culture. Intrinsic elements are known as psychological which involves value, beliefs and the assumption, while the extrinsic refer to the behavioral elements that contain elements of behavior, norms, rituals, symbols. Changes in organisational culture will create awareness about the importance of maintenance.

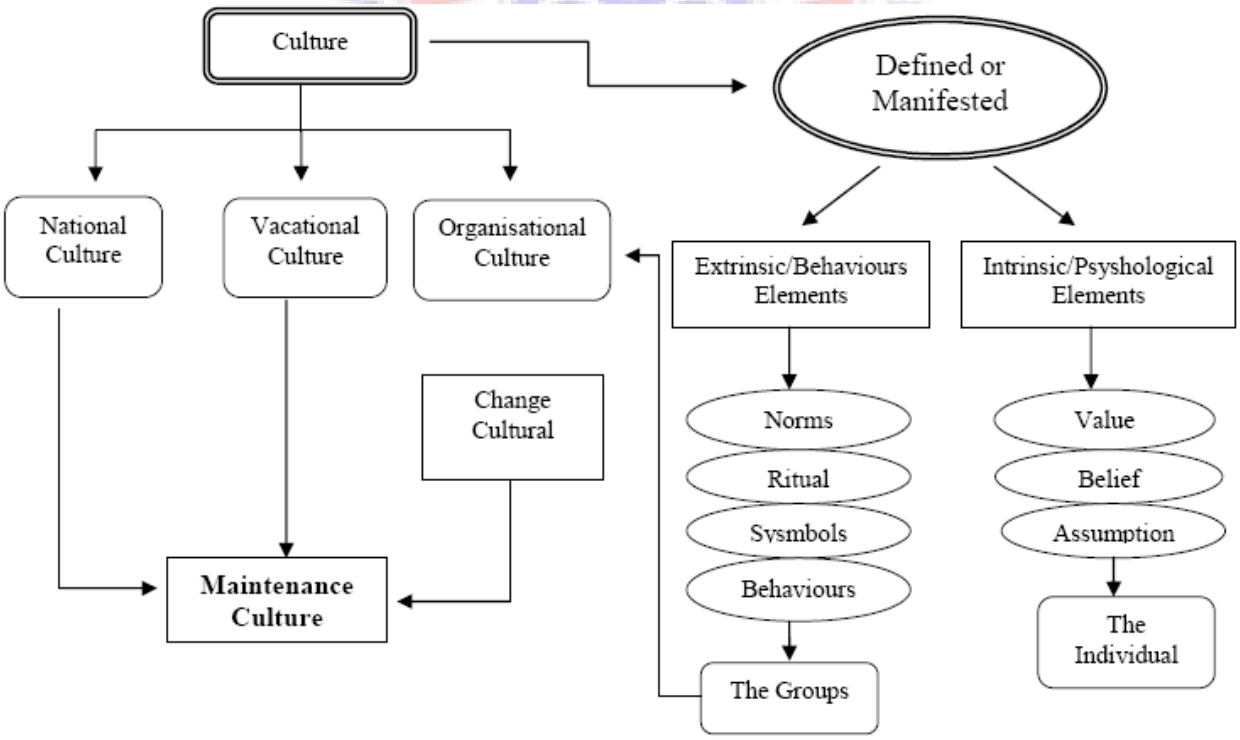

Figure 2.1 Framework of maintenance culture development: (Mohd Saidin 2008)

2.5 The Objectives of Maintenance Management

Computer based maintenance management can increase plant availability and reduce overall maintenance costs. John Hookham describes some of the essential elements that are needed in such systems for maximum effectiveness**.**

Maintenance management can be considered as the direction and organisation of resources to control the availability of equipment. The tasks associated with maintenance can be divided into three main areas; work management, plant condition control and cost control.

2.5.1 Work Management

Work management is concerned with the logistics of organising maintenance and has the following objectives:

i. To identify, control and co-ordinate the resources (labour, spare parts, materials and tools) that are required to complete the maintenance tasks;

ii. To ensure that job priorities are correctly allocated;

iii. To locate plant failures or potential failures and provide an appropriate response.

2.5.2 Plant Condition Control

Close monitoring and control of the overall plant condition is necessary to achieve a high level of plant availability. Its long-term objectives are to

i High light maintenance engineering problems by monitoring plant performance, diagnosing causes and providing effective solutions;

ii. Adapt maintenance policy as production requirements change. This should not be restricted to changes in preventive maintenance but should encompass re-design and the application of condition monitoring techniques where appropriate.

2.5.3 Cost Control

The third activity, cost control, is normally operated as part of a company‟s budgetary and expenditure control system, primarily for job costing. To achieve the improvements in maintenance effectiveness and efficiency, the maintenance manager must make use of all of the available management tools.

2.5.4 Computerised Maintenance Management System

A computerised maintenance management system will contain a number of integrated programs or modules to improve the efficiency and effectiveness of the maintenance engineering function. In this sense the system is like a set of tools, albeit highly complex and difficult to produce. But with the correct design the system should be easy to use and provide the engineer with all of the information that is required to make better decisions (Adrelia 2007).

The basic modules or component part of the maintenance systems are as follows:

i. Preventive maintenance

ii. Asset register

iii. Maintenance stores system

iv. Purchasing

v. Work order planning and control

vi. Plant history and analysis

2.5.5 Preventive Maintenance

By preventive maintenance we mean all actions carried out to prevent or pre-empt a failure. These actions can take two forms.

Firstly, there is inspection based or non-intrusive techniques. These will encompass the relatively complex inspection such as vibration monitoring but should also include the basic techniques: look, listen, touch and smell. Often these basic techniques are ignored but should and can form the basis for detecting and preventing failures. The preventive maintenance system should provide the inspector with details on where the work should be done, what the initial values and points to be aware of are and also when the work should be done. To enable the inspector‟s time to be used effectively the work list should be output in, for example a route order.

Secondly, preventive maintenance should prompt for services and overhauls on a calendar basis, on hours run or amount of product manufactured. Using preventive maintenance it is possible to have a much better idea of the condition of the equipment and consequently it is possible to increase the percentage of work that can be planned. Early detection of faults will decrease both the number and duration of breakdowns.

2.5.6 Asset Register

This is an inventory of all of the plant, equipment and services for which a manager has responsibility. Repair work that is generated by the preventive maintenance system will in most cases need to be planned and prepared. Consequently it is necessary for the planner to have rapid access to details of the equipment. This includes technical details, serial numbers, location, manufacturer etc. and most important a list of the spare parts used on the machine together with

the current stock balance. The purpose of the asset register is to centralize this data for use in planning maintenance work.

In addition to providing rapid access to information, the manager can be sure that the relevant data is always available and has not been misplaced.

2.5.7 Maintenance Stores System

It is essential that this maintenance stores control system is not a modified production stores control system. The requirements of maintenance differ significantly from those of the production department. For example, the usage profile for maintenance spares differs from that of production materials. If a spare part is used only during a major shutdown it is important that the part is available when required and also that spares are not stocked unnecessarily, tying up valuable working capital. Since it is not possible to completely avoid some breakdowns, it is necessary to organize the repair work as quickly and efficiently as possible.

For example, during a breakdown, often the last thing a fitter knows about a spare part is the company‟s intemal stores control number. He is more likely to know one of the following:

i. The machine that the part is used on;

ii. The supplier‟s item number

iii. A basic description

It is essential therefore that the fitter enquire on any part of the three items listed above in addition to the company assigned stores control number.

2.5.8 Purchasing

The purchasing system is closely related to the stores control system and has three main inputs. Firstly, there should be a facility to automatically prompt for the reordering of items that have reached a pre-determined re-order point. Secondly, the system should enable the engineer to purchase items that are in constant use and spares that are used only during a major plant shutdown.

Thirdly, the maintenance department will need to purchase contractor and building services, together with non stock items. Purchasing for maintenance can take many forms and requires many functions to deal with, for example, telephone ordering, order chasing, invoice checking and monitoring.

The chosen system should enable all of these functions to be carried out by the Purchaser. If only a limited number of these functions is available, with the others being carried out by, for example, a corporate system, mistakes will occur and this will have an adverse effect on the operation of the entire maintenance department.

2.5.9 Work Order Planning and Control

Efficient and effective maintenance requires detailed planning of repairs, plant services, overhauls and projects. For each asset in the system a maintenance plan is require.

This work must be co-ordinated with the requirements of production to have the minimum effect on the overall production plan. The work that is to be done should be recorded directly into the system. The additional information such as the required manning level, required date, estimated time etc. can be added by the planner. To do this effectively the planner will need access to standard job descriptions, the production schedule, resource availability, details of outstanding

work etc. consequently the planner should be able to list for example: the work planned for the next stop, outstanding work from the last stop, up-to-date details of committed resources etc. pre-planning of work enables the optimal use of the maintenance department‟s most critical resources: time and labour. The maintenance plan should be easily modified to allow for major emergency work, changes in production methods and improvements in design.

Maintenance control indices can provide a method of assessing maintenance activities. Control indices should function as part of the overall maintenance information system and use dynamic data such as labour costs, spares usage, and delay costs. Analysis of the data provides feedback that the manager can use to assess actual performance against a target, and so monitor the effect of changes in maintenance policy.

2.5.10 Plant History Analysis

A plant history system is essential to follow-up maintenance activity for both technical and financial aspects. With a manual card based system this is extremely difficult and time consuming. Computer based systems come into their own when large a volume of data needs to be sorted and presented in a meaningful way. In the longer term,

Analysis of plant history can provide the most effective method for improving plant availability. The system should require a minimum of data input from the preventive maintenance and work order modules.

For the analysis to be accurate, it is essential that all the base data is transferred from the work order module together with the additional information which is fed back as a result of the work that has been done, i.e. a fault code, downtime, a description of any extra work done. The plant history module should have standard reports to show for example:

i. The relationship between preventive maintenance and corrective maintenance;

ii. The equipment causing the most downtime;

iii. The equipment with the highest number of faults.

To obtain the full benefits of recording plant history, the company will need to have a smoothly operating stores inventory system to provide details of spares usage, and an accurate work order control system to provide labour hours and costing.

Reliability and defect / failure analysis is an essential tool for the maintenance manager. Defect analysis can be used to examine the performance of a single plant item or group of items.

Defects should be recorded using a coding system and then analyzed to find the mode of failure (early life, random or wear out), mean time between failures and so on.

The application of such techniques was used to good effect in a company where couplings on a mill failed frequently, resulting in high maintenance costs. The preventive maintenance policy was changed a number of times in an effort to increase the reliability, without any success.

Statistical analysis of the time between failure occurrences across all of the couplings showed clearly that failures occurred in early life. This suggested that the cause of the failures was due to poor installation. Further investigation proved this to be the case.

Without computer-based analysis it is difficult to analyses plant history because of:

i. The large volume of data;

ii. The vague way in which the data is recorded

iii. The difficulty in processing the data that was relevant to the investigation.

2.5.11 Implementation and Benefits

For the implementation of a computer based maintenance management system to be successful a number of points need to be considered:

i. Agree a detailed realistic schedule for implementation;

ii. The end user of the system should have rapid and direct access to the information;

iii. The programs should be easy to use by inexperienced computer users;

iv. In larger plants, there should be terminals situated in all of the relevant areas if the plant;

v. The end users need to e trained to ensure they are familiar with the information that is available.

The end user should be involved in all stages of the implementation to ensure the system is seen as the maintenance department‟s system and not the system that has been imposed by management or the data processing department.

2.5.12 Typical Results Achieved

In general, using a computer based maintenance managements system will increase availability and reduce maintenance costs. Increases in availability range from 2% to

6% and reductions in maintenance costs range from 5% to 25%. Many users have reported reductions in spare parts inventory ranging from 5% to 15% after reorganisation, and computerization of the maintenance stores. (Adrelia 2007)

2.6 Maintenance Strategies

A maintenance strategy means a scheme for maintenance, i.e. an elaborate and systematic plan of maintenance action (Kelly Anthony 2006). The following are the maintenance strategies that are commonly applied in the plants.

- Breakdown Maintenance or Operate to Failure or Unplanned Maintenance
- Preventive or Scheduled Maintenance
- Predictive or Condition Based Maintenance
- Opportunity Maintenance
- Design out Maintenance

The equipment under breakdown maintenance is allowed to run until it breaks down and then repairing it and putting it back to operation. This strategy is suitable for equipments that are not critical and have spare capacity or redundancy available. In preventive or scheduled Maintenance, maintenance actions such as inspection, lubrication, cleaning, adjustment and replacement are undertaken at fixed intervals of numbers of hours or Kilometers. An effective PM program does help in avoidance of accidents. Condition monitoring (CM) detects and diagnoses faults and it helps in planned maintenance based on equipment condition. This condition based maintenance strategy or predictive maintenance is preferred for critical systems and for such systems breakdown maintenance is to be avoided. A number of CM techniques such as vibration, temperature, oil analysis, etc. have been developed, which guide the users in planned maintenance. In opportunity maintenance, timing of maintenance is determined by the procedure adopted for some other item in the same unit or plant. In design out maintenance, the aim is to minimize the effect of failures and in fact eliminates the cause of maintenance. Although it is an engineering design problem, yet it is often a responsibility of maintenance department. This is opted for items of high maintenance cost that are due to poor maintenance, poor design or poor design outside design specifications. It may be mentioned that a best maintenance strategy for each item should be selected by considering its maintenance characteristics, cost and safety.

In addition to the above, new strategies concepts such as Proactive Maintenance, Reliability Centered Maintenance (RCM), Total Productive Maintenance (TPM), etc. have recently been evolved to look it from different perspectives and this has helped in developing effective maintenance. In proactive maintenance, the aim is to identify what can go wrong, i.e. by monitoring of parameters that can cause failures. In RCM, the type of maintenance is chosen with reliability of the system in consideration, i.e. system functions, failures relating to those functions and effects of the dominant functional system failures. This strategy in the beginning was applied to critical systems such as aircrafts, nuclear and space applications. At present, this is being extended to critical systems in the plant. TPM, a Japanese concept, involves total participation of all concerned. The aim is to have overall effectiveness of the equipment with participation of all concerned using productive maintenance system.

2.6.1 Functions of a Maintenance Department

The following are the major functions of a maintenance department:

- Maintenance of installed equipment and facilities
- Installations of new equipment and facilities
- PM tasks – Inspection and lubrication of existing equipment
- CM tasks – monitoring of faults and failures using appropriate techniques
- Modifications of already installed equipment and facilities
- Management of inventory
- Supervision of manpower
- Keeping records

2.6.2 Maintenance Organisation

This concerns achieving an optimum balance between plant availability and maintenance resource utilization. The two organisation structures that are common are: Centralised and Decentralised. A decentralised structure would probably experience a lower utilisation than centralised one but would be able to respond quickly to breakdowns and would achieve higher plant availability (Levitt Joel, 1997). In practice, one may have a mix of these two. A maintenance organisation can be considered as being made up of three necessary and interdependent components.

1. **Resources**: men, spares parts and tools
2. **Administration**: a hierarchy of authority and responsibility for deciding what, when and how work should be carried out.
3. **Work Planning and Control System**: a mechanism for planning and scheduling the work and feeding back the information that is needed for correctly directing the maintenance effort towards defined objective.

It may be mentioned that maintenance production system is a continuously evolving organism in which the maintenance organization will need continuous modifications in response to changing requirements. Moreover, it is required to match the resources to workload. Maintenance activities be it preventive or condition monitoring, involve use of resources- men and materials including documents. This requires coordination amongst the involved personnel so that these are timely undertaken. Work planning and control system under maintenance management in the plant ensures this and provides planning and control of activities associated with maintenance. This means application of general management principles of planning, organising, directing and controlling to the maintenance functions, e.g. to the establishment of procedures for development of maintenance strategy and to models for describing the flow of work through maintenance work

planning department. Control system controls the maintenance cost and plant condition (Wilson Alan, 2002).

2.6.3 Elements of Effective Maintenance Management

An effective maintenance system according to Levitt Joel (1997) includes the following elements

- Maintenance Policy
- Control of materials
- Preventive Maintenance
- Condition Monitoring
- Work Order
- Job planning
- Priority and backlog control
- Data recording system
- Performance measurement measures or indices

Maintenance performance for a plant or an organization can be accessed through analysis of Reliability, Availability and Maintainability (RAM) plant data. Relevant parameters, measures or indices for specific plants can be identified. The performance over a period of time will show if it is improving, going down or being sustained. This will also help in knowing how well the objectives are being met. In addition, it will guide the areas which are strong and which need to be strengthened. Use of computers and dedicated software will certainly help in implementing this and the maintenance management system in general.

2.7 CONCLUSION

The above discussions have briefly focused on the various aspects of maintenance management. Maintenance is expected to play even much bigger role in years to follow, as industries and public institutions worldwide are going through an increasing and stiff competition and increased automation of plants. The down time cost for such systems is expected to be very high. To meet these challenges, maintenance has to use latest technology and management skills in all spheres of activities to perform its effective role profitable in the sustenance of the Ghanaian economy.

CHAPTER THREE

METHODOLOGY AND MATERIALS

Introduction

This chapter therefore describes the methods used in collecting the appropriate data for analysis. It would be based on the following sub-topics: research design, population, sampling techniques, instruments for data collection and data collection procedures.

3.1 Research Design

This research seeks to assess the maintenance culture of Government Vehicles in Senior High Schools in the Birim Central Municipal Assembly. The research design used in the study is a descriptive survey and document analysis. These were purposely used to cater for the analysis of both quantitative and qualitative data.

According to Gay (1987), the descriptive survey method involves collecting data in order to test hypothesis or to answer questions concerning the status of a study.

The descriptive sample survey has also been recommended by Babbie (2001) for the purpose of generalization from a sample of population so that inferences can be made from some attributes, behavior and characteristics of the population.

3.2 Population

The population was drawn from ten (10) Senior High Schools in the Birim Central Municipality for fair considerations and critical analysis for assessing the maintenance culture of government vehicles in these schools. The population included the following, Headmasters/Headmistresses, Assistant Headmasters/Headmistresses and Drivers in these schools.

2.3 Sample And Sampling Techniques

A sample of twenty (20) school drivers, ten (10) Headmasters/Headmistresses and Ten (10) Assistant Headmasters/Headmistresses were used. A simple random sampling technique was used in selecting the respondents. With the simple random sampling, each member of the population under study had an equal chance of being selected. Because of probability and chances, the sample contained subjects with characteristics similar to the entire population of the respondents.

2.4 Instrument for Data Collection

The data collection instruments used included questionnaires and documentary sources such as internet, books, and journals. Questionnaires and interviews guides were designed for Headmasters/Headmistresses, school drivers and school administrative officers in the selected schools in the municipality.

The questionnaire is a set of written questions on a given problem, which the respondent is required to answer in writing by using a close-ended type. This close-ended type provides answers in an alternative form and the respondents have to choose from the given alternatives. The questionnaires therefore used were aimed at literates such as Headmasters/headmistresses, Assistant headmasters/ headmistresses and school driver. The questionnaires were made up of thirty-four (34) items in two (2) categories. For instance, questionnaires designed for school drivers were made up of twenty One (21) items and were in sets. The first set of items was on personal information of the drivers, followed by items on maintenance procedures and practices. The second questionnaires were designed for Headmasters/headmistresses and Assistant headmasters / headmistresses. They were made of thirteen (13) items. Data sought included personal information, items on financing of maintenance as well as maintenance planning and management.

All these information was needed to answer the research questions. Also the researcher used both structured and unstructured interviews to obtain further information needed for the purposes of the research.

3.5 Validity

According to Joppe (2000), validity determines whether the research instrument truly measures what it was intended to measure. To ensure the validity of the questionnaire it was given to the supervisor who took his precious time, went through the document and gave the necessary suggestions and corrections to ensure that its content is valid to the research. The study also solicited the expertise of some Senior Lecturers from the Department of Design and Technology Education of the University of Education, Winneba – Kumasi.

3.6 Pilot-Test

The questionnaire was pre-tested at the West Akim Municipal Assembly in the Eastern Region of Ghana where two schools in the municipality were selected for the test. The municipality and the two schools were selected because they share similar characteristic with the municipality selected for the study.

3.7 Reliability

A pilot test of the instrument was carried out in Two (2) schools in the West Akim Municipal Assembly in Eastern Region of Ghana. These two (2) schools used for the pilot test do not form part of the sample for the study. The reliability of official questionnaire was determined using the split half method. Using odd-even items, the questionnaire was split into halves and given to some non-research subjects to respond to.

The two sets of scores were corrected. It yielded an internal consistency of 0.82 based on Pearson‟s product moment correlation formula. This was then compared with the tabulated co-efficient of reliability which according to Bryman and Cramer (2001) is acceptable at 0.8 meaning the internal consistency (reliability) of the instrument was acceptable.

3.8 Data Collection Procedures

The researcher administered the questionnaires himself to capture the real facts on the ground. The collection of the data covered a period of three weeks. It was done through personal visits to the residence participant.

The questionnaires were given the participants to respond to within a time frame of one week. This was done to enable the participants to respond to them at their own convenience.

The answered questionnaires were then collected for analysis. The researcher also had the chance to interview the respondents on the maintenance culture of Government Vehicles in their schools.

3.9 Data Analysis

Coding schemes were developed to organize the data into meaningful and manageable categories. This involved the data obtained from questionnaires and interviews. The categorized data were later converted into frequency counts and simple percentages which were used to answer the research questions as rose in the study.

This study employed both qualitative and quantitative methods in analyzing the data that was collected. According to Tabin and Fraser (1998), combining qualitative and quantitative methods of research provides multiple theoretical perspectives.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

Introduction

This chapter presents the results of the study. It also discusses the results of the study. Which are presented in tables with their respective percentage score? The presentation and discussion of the results of the research was done according to the research questions.

Analysis of Background Information

The analysis of the background information of the respondents was based on the responses obtained from the questionnaire items designed for each category of respondents from Senior High Schools in the Akim- Oda municipal Assembly. Analyzing the background information of the respondents‟ areas like gender, age and academic qualifications were considered. The responses were then presented in frequency tables as shown in tables 1, 2 and 3 below.

Table 4.1 Gender distribution of the respondents

SEX	FREQUENCY	PERCENTAGE (%)
Male	37	92.50
Female	3	7.50
Total	**40**	**100**

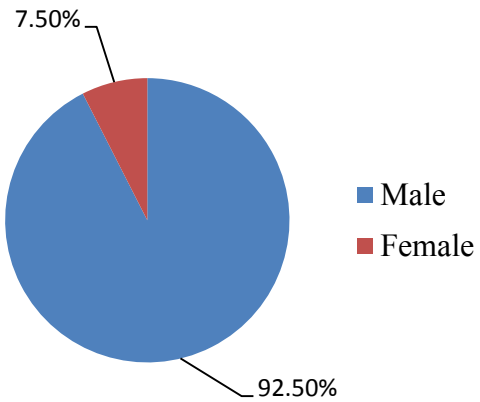

Figure: 4.1 Gender distribution of the respondants

Table 4.1 and figure 4.1 above indicates that 92.5% of the respondents were males and 7.5% of them female

Table 4.2 Age distribution of respondents.

Age	Frequency	Percentage (%)
18-25	0	0
26-30	2	5
31-35	4	10
36-40	6	15
41-45	4	10
46-50	4	10
51 and above	20	50
Total	**40**	**100**

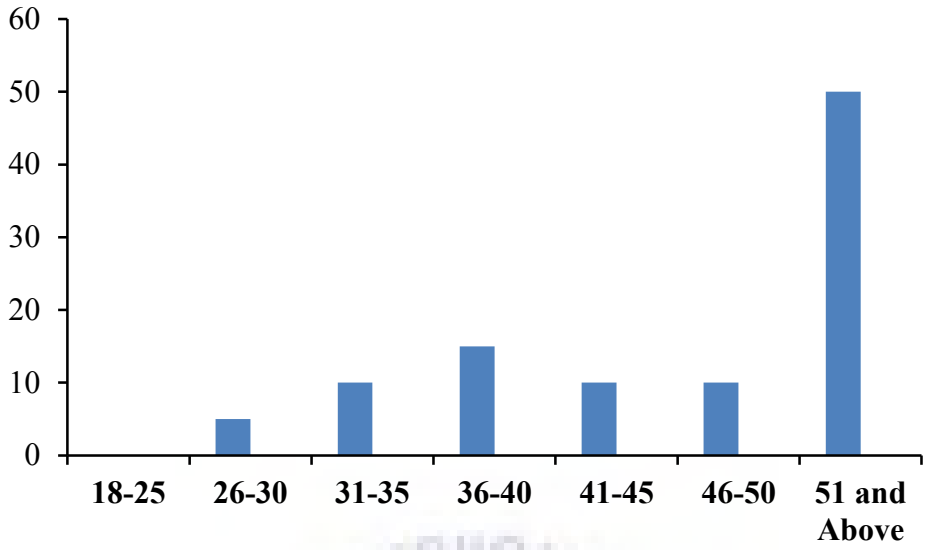

Figure 4.2 Age distribution

From table 4.2 and figure 4.2 shows that respondents had ages between18-25 representing 0%. 2 respondents had ages ranging from 26-30 which represents 5%. 4 respondents had ages between 31-35 representing 10%. Also 15% had ages between 36-40, 4 respondents representing 10% had ages between41-46 and then 10% also had ages ranging from 46-50. Those who had ages ranging from 51 and above were 20 representing 50% of total respondents.

Table 4.3Academic qualification of respondents.

Academic qualification	Frequency	Percentage (%)
MSLCE	9	22.5
SSSCE	2	5
GCE „O‟ LEVEL	0	0
GCE „A‟ LEVEL	0	0
NVTI	9	22.5
FIRST DEGREE	13	32.5
SECOND DEGREE	7	17.5
DOCTORATE DEGREE	0	0
Total	40	100

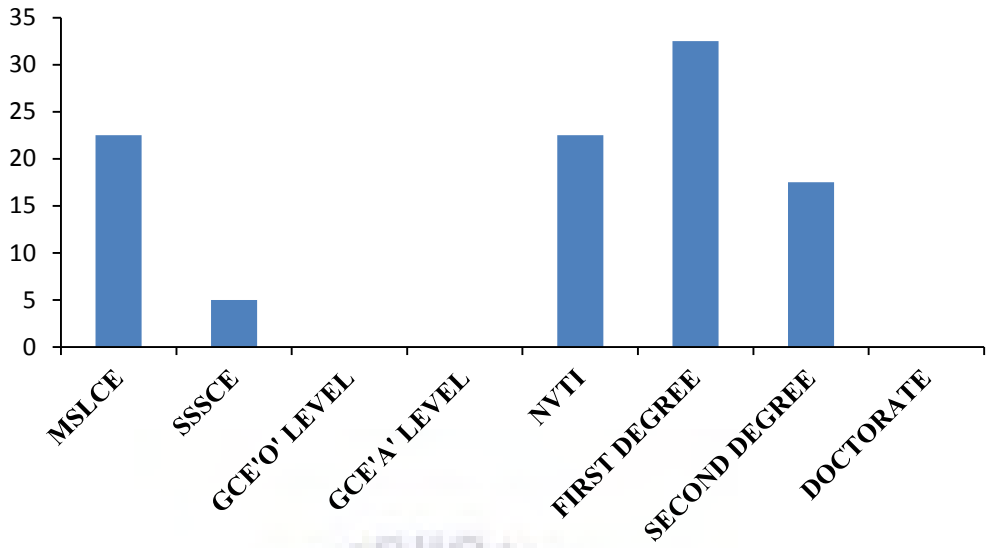

Figure: 4.3 Academic qualification of respondents

As indicated in table 4.3 and figure 4.3 respectively, 9 of the respondents representing 22.5% are holders of MSLCE and 2 of them representing 5% are holders of SSSCE. Also 9 of the respondents are holders of NVTI representing 22.5% and 13 representing 32.5% are first degree holders with 7 representing 17.5% are second degree holders. Others are GCE „O‟ Level 0%, GCE „A‟ Level 0% and Doctorate degree o%. This means that none of the respondents holds GCE „O‟ Level, GCE „A‟ Level and Doctorate degree as their highest academic qualification.

Quantitative Responses to the Research Questions

Research Question 1: What are the maintenance practices in the schools?

Table 4.4 Knowledge about preventive maintenance

Do you know about preventive maintenance?	**Frequency**	**Percentages (%)**
Yes	38	95
No	2	5
Total	40	100

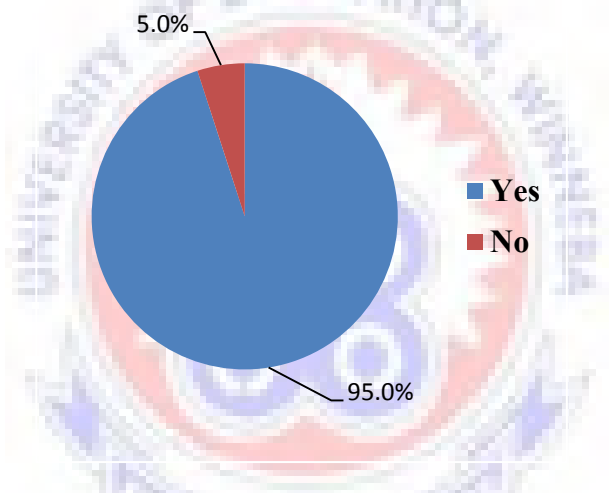

Figure: 4.4 knowledge about preventive manatemance

Table 4.4 and figure 4.4 shows the responses given by the respondents on research question 1. This includes Headmasters and Assistant Headmasters and school drivers. From the table, 38 of the respondents representing 95% said they know about preventive maintenance as against 3 of them representing 5% said they do not know about preventive maintenance.

Table 4.5 Responses on maintenance practices

Do you practice preventive maintenance?	Frequency	Percentage (%)
Yes	36	90
No	4	10
Total	**40**	**100**

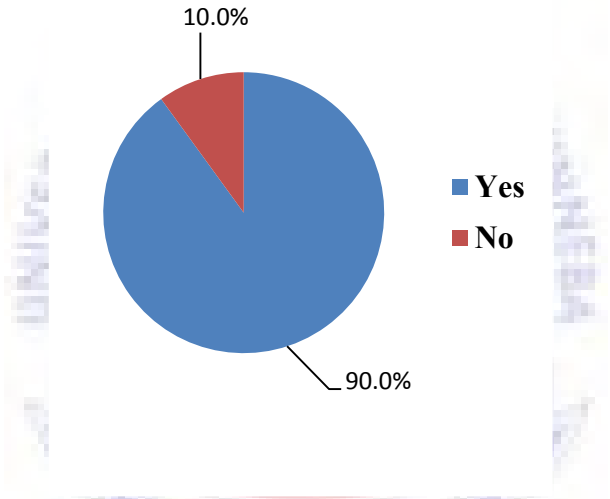

Figure: 4.5 Responses on maintenance practices

Table 4.5 and figure 4.5 shows that 36 respondents which represents 90% of the total respondent said that they practice preventive maintenance in their schools. Whiles 4 of the respondents representing 10% said that, they do not practice preventive maintenance.

Table 4.6 Responses on record keeping.

Do you keep records on maintenance activities?	Frequency	Percentage (%)
Yes	36	90
No	4	10
Total	**40**	**100**

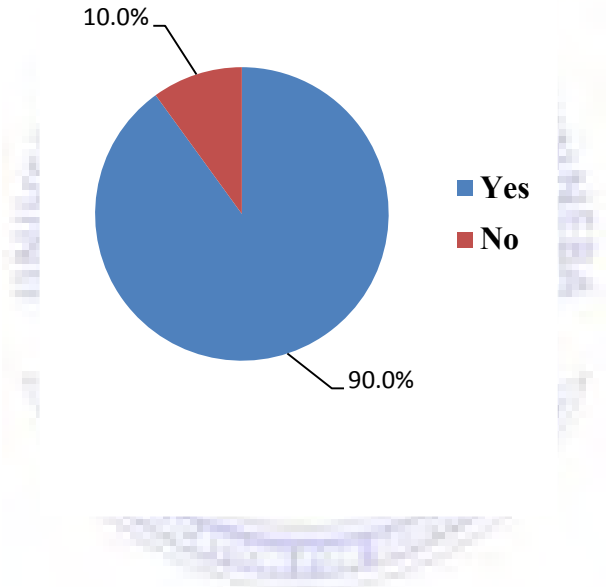

Figure: 4.6 Responses on record keeping

Table 4.6 and figure 4.6 indicate that 36 of the respondents representing 90% of the total respondents keep records on maintenance activities. 4 of them which represent 10% do not keep records on maintenance activities.

Table 4.7 Responses on where vehicles are parked.

Do you park in a garage?	Frequency	Percentage (%)
Yes	11	55
No	9	45
Total	**20**	**100**

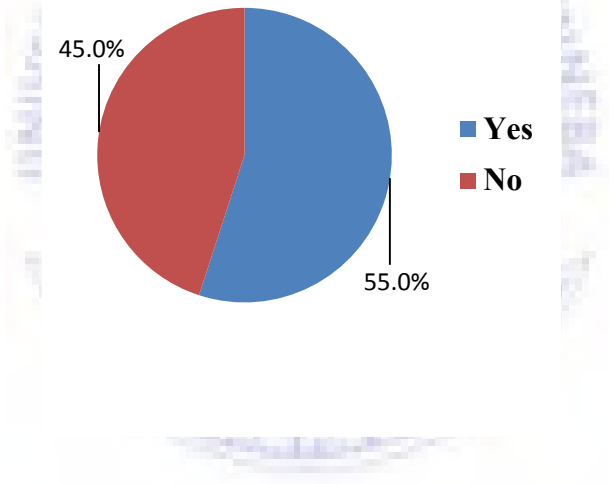

Figure: 4.7 Responses on where vehicles are packed

Table 4.7 and figure 4.7 shows the responses given by school drivers. 11 of the respondents representing 55% said they park the school vehicles in a garage and 9 of them which represent 45% said they do not park in a garage.

Table 4.8 Responses on asset register.

Do you have an asset register?	Frequency	Percentages (%)
Yes	18	90
No	2	10
Total	**20**	**100**

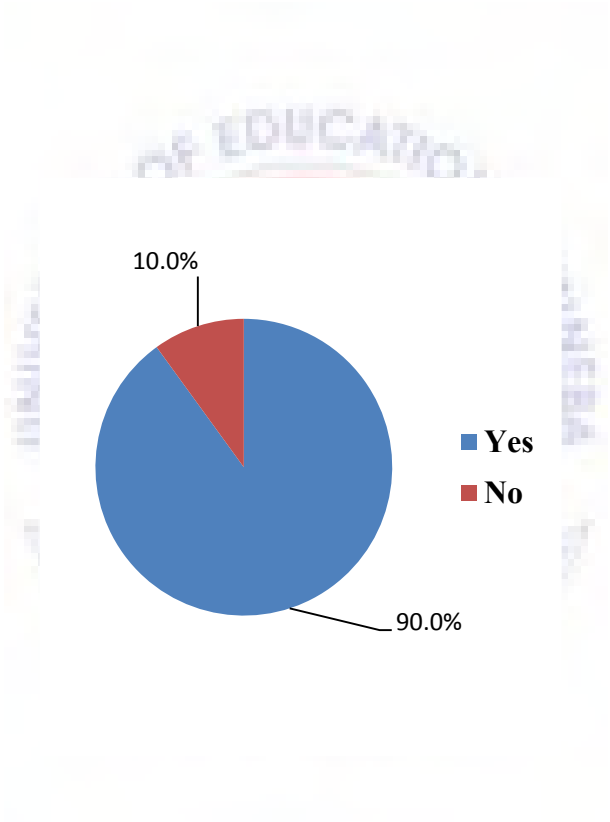

Figure: 4.8 Responses on asset register

Table4. 8 and figure 4.8 above indicate responses given by school Heads and their Assistants. 18 of them representing 90% said that they have an asset register in their schools. 2 of the respondents which represent 10% said they do not have an asset register their schools.

Table 4.9 Responses on maintenance checks.

How often do you go to the mechanic for maintenance checks	Frequency	Percentage (%)
Monthly	11	55
Quarterly	0	0
When the vehicles breakdown.	9	45
Total	**20**	**100**

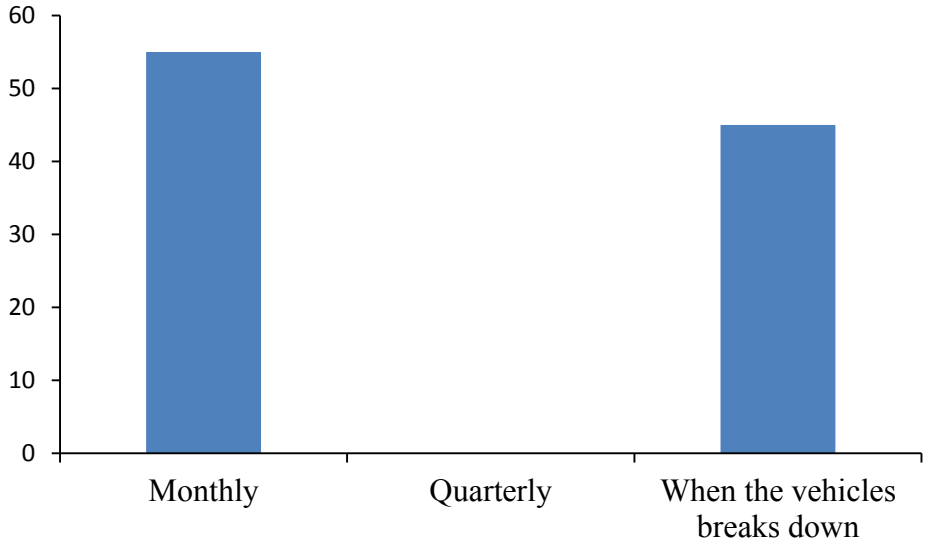

Figure: 4.9 Responses on maintenance checks

Table 4.9 and figure 4.9 shows the responses given by school drivers. 11 of the drivers which represent 55% said that, they go to the mechanic monthly for maintenance checks. 9 of them representing 45% said they go to the mechanic maintenance checks only when the vehicles breakdown.

Table 4.10 Responses on maintenance schedule.

Do you have a maintenance schedule for school vehicles?	Frequency	Percentage (%)
Yes	19	95
No	1	5
Total	**20**	**100**

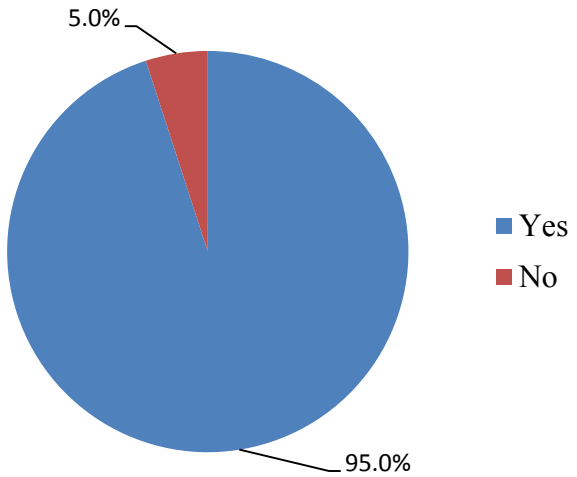

Figure: 4.10 Responses on maintenance schedule

Table 4.10 and figure 4.10 shows responses given by school drivers. 19 of them represent 95% said that they have a maintenance schedule for school vehicles. 1 of the respondent which represents 5% said that, they do not have a maintenance schedule for school vehicles.

Research Question 2: How maintenance issues are handled in the schools.

Table 4.11 Formation of maintenance committee

Do you have a maintenance committee in your school?	Frequency	Percentage (%)
Yes	11	55
No	9	45
Total	**20**	**100**

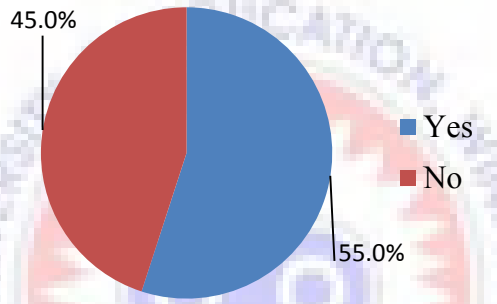

Figure: 4.11 Formation of maintenance committee

Table 4.11and figure 4.11 shows the responses of headmasters and assistant headmasters. 11 of them which represent 55% of the total respondent said, they have a maintenance committee in their schools. 9 of the respondent representing 45% said they do not have a maintenance committee in their Schools. The maintenance committee, is the committee in-charge of maintenance management and administration in schools with the over sight responsibility of helping management to plan and implement maintenance activities.

Table 4.12 Responses on maintenance plan

Do you have a maintenance plan for school vehicles?	Frequency	Percentages (%)
Yes	18	90
No	2	10
Total	20	100

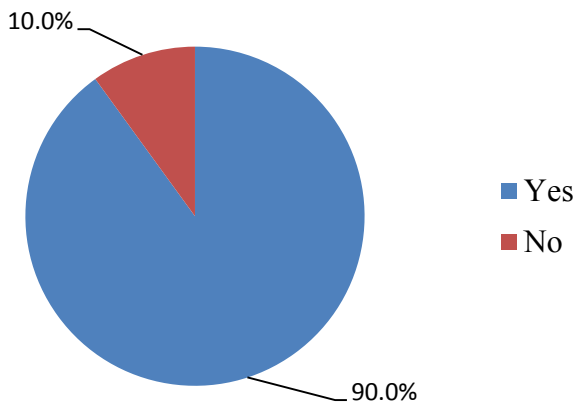

Figure: 4.12 Responses on maintenance plan

Table 4.12 and figure 4.12 indicates that 18 of the respondents representing 90% said have they have maintenance plan for their school vehicles. 2 of them which represent 10% said that they do not have a maintenance plane for school vehicles. These are responses from Headmasters and their Assistants.

Table 4.13 Responses on maintenance policy.

Do you have a maintenance policy?	Frequency	Percentage (%)
Yes	3	15
No	17	85
Total	**20**	**100**

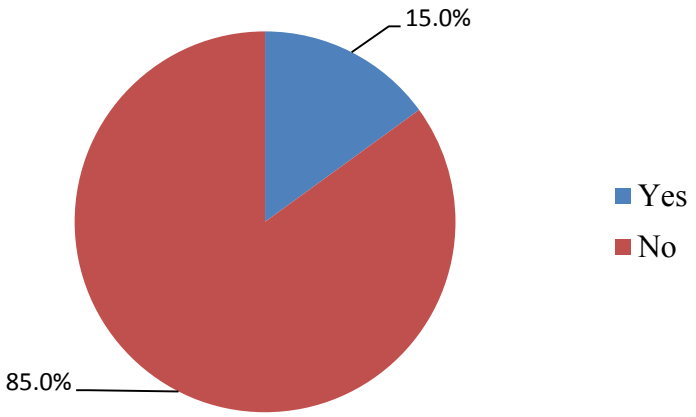

Figure 4.13 Responses on maintenance policy

Table 4.13 and figure 4.13 shows responses from headmasters and assistant headmaster. 17 of them representing 85% said that they have a maintenance policy in their schools regarding the maintenance of school vehicles. 3 of the respondents which represent 15% said that they do not have a maintenance policy in their schools.

Table 4.14 Creation of maintenance fund.

Do you have funds set aside for maintenance?	Frequency	Percentage (%)
Yes	3	15
No	17	85
Total	**20**	**100**

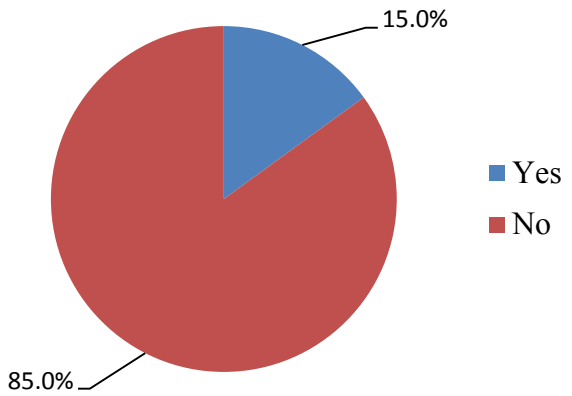

Figure: 4. 14 Creation of maintenance fund

Table 4.14 and figure 4.14 depict responses from heads and their assistants. 3 of the respondents representing 15% said that, they have funds set aside for maintenance while 17 of them which represent 85% said that they do not have funds set aside for maintenance .

Table 4.15 Response to breakdowns

Do you have a decentralized body to respond quickly to breakdowns?	Frequency	Percentage (%)
Yes	3	15
No	17	85
Total	**20**	**100**

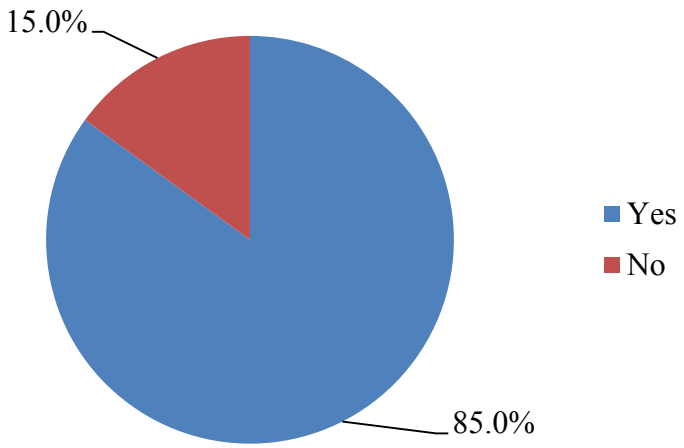

Figure: 4.15 Response to breakdowns

Table 4.15 shows responses from school heads and their assistants. 17 of them which represent 85% said that they do not have an autonomous body that respond quickly to breakdown of school vehicles. 3 of the respondent representing 15% said that they do not autonomous body that respond quickly to breakdown of school vehicles.

Research Question 3

What are the challenges militating against the maintenance of government vehicles.

Table 4.16 factors militating against maintenance

What difficulty do you have in maintaining vehicles?	Frequency	Percentage (%)
Finance	20	100
Access to qualified mechanics	0	0
Lack of genuine parts	0	0
Total	**20**	**100**

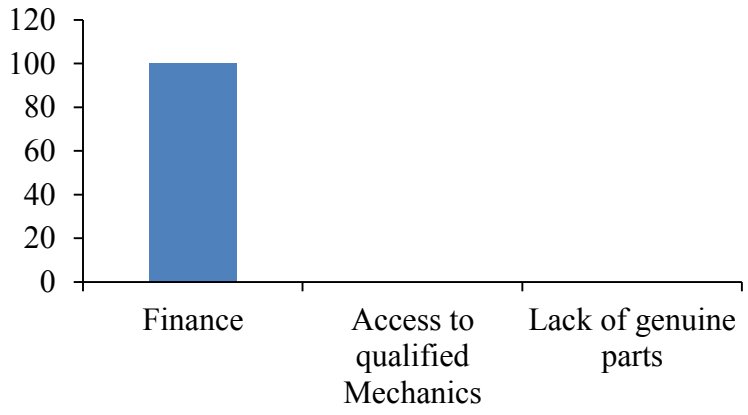

Figure 4.16 Factors militating against maintenance

Table 4.16 and figure 4.16 shows responses from Heads of schools and their Assistants. All the respondent numbering 20 which represent 100% of the total respondents said that finance is their major challenge when it comes to maintenance of the school vehicles.

Table 4.17 Sources of finance for maintenance.

How do you finance maintenance activities?	Frequency	Percentage (%)
Support from government	0	0
Internally generated fund (IGF)	20	100
Donations	0	0
Total	**20**	**100**

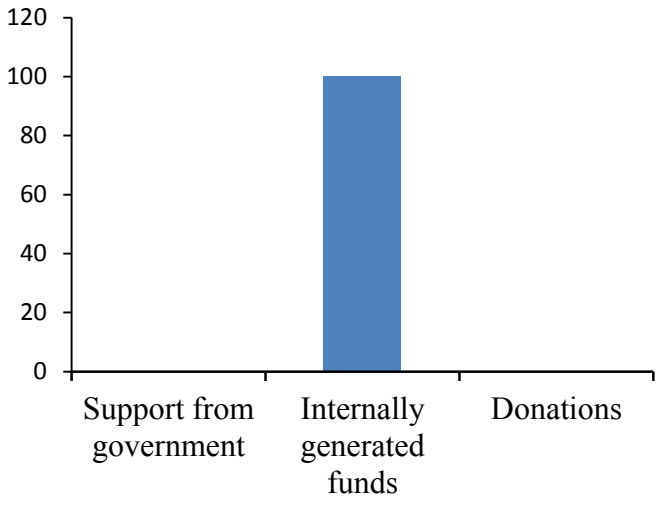

Figure 4.17 Sources of finance for maintenance

Table 4.17 and figure 4.17 indicate responses from heads and their assistants. All the respondents numbering 20 representing 100% of the total respondents said that they finance maintenance activities from internally generated fund (IGF).

Table 4.18 Attitude of drivers

How is the attitude of drivers towards maintenance?	Frequency	Percentage (%)
Poor	0	0
Fair	7	35
Good	13	65
Total	20	100

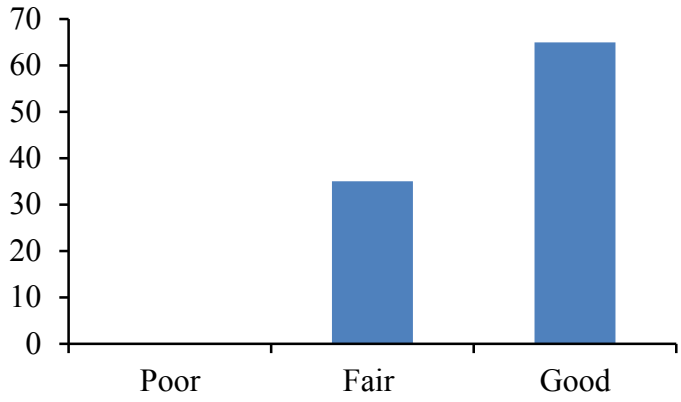

Figure: 4.18 Attitude of drivers

Table 4.18 and figure 4.18 depicts responses from school heads and their assistants. 7 of the respondents which represent 35% rated the attitude of their school drivers towards maintenance as fair. 13 of the total respondents representing 65% rated the attitude of their school drivers towards maintenance as good. None of the respondents rated the attitude of their school drivers towards maintenance as poor resenting 0%.

Table 4.19 Responses on driver's challenges.

What is your major challenge?	Frequency	Percentage %
Late release of funds for maintenance	19	95.0
Non – availability of genuine parts	1	5.0
TOTAL	**20**	**100.0**

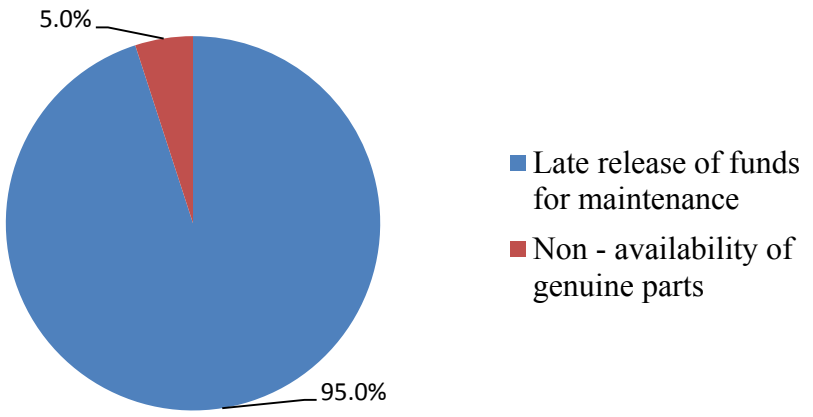

Table 4.19 Responses on driver's challenges

Table 4.19 and figure 4.19 shows the responses from school drivers. 19 of the total respondents representing 95% said that the late release of funds for maintenance is their major challenge. 1 of them which represent 5% said that non-availability of genuine parts for maintenance is his major challenge.

Qualitative Response to the Research Questions

Research Question 1. What are the maintenance practices in the school?

Findings: The following were the responses given by the various groups of respondents on the maintenance culture of government vehicles in senior high schools.

Qualitative responses from school drivers on research question 1. They were asked what the maintenance practices in their schools are. 80% of them said even though there are laid down policies and plans for maintenance activities in the schools, maintenance of the school vehicles are at the sole discretion of the Headmasters. Mostly, maintenance is done only and when the vehicles are broken down. Some also responded that they practice preventive maintenance by following a laid down maintenance schedule but sometimes not strictly followed. About 85% of the drivers said that they have not attended any workshop or training on maintenance. The above phenomenon retards their ability to manage and undertake minor maintenance activities. Some lamented about their inability to keep records on maintenance activities due to the fact that they have never had any form of training in maintenance. This they said affect the management of maintenance practices in the school.

Qualitative Responses from School Heads and Their Assistants on Research Question 2

Research Question 2: How is maintenance issues handled in the school?

Findings: Only eleven (11) school have maintenance committee whose over sight responsibility is to do periodic maintenance checks and recommend to management what maintenance activity they should embark upon. They stated clearly that the maintenance committee is not an autonomous body and their activities are not decentralized therefore they do not receive funds to

undertake their mandate. Some of the respondents said that maintenance issues are centralised in the school and that the head is responsible for the maintenance of the school vehicles upon advice from the school driver.

About 55% of the respondents admitted that they have maintenance committee in their schools but they do not have the powers to effectively handle maintenance issues because they are not resourced to do so. Hence maintenance of the vehicles is done only and when they breakdown. This phenomenon they said, has contributed to high cost of maintenance and frequent breakdowns on the road.

Qualitative Responses from School Heads and Their Assistants on Research Question 3

Research question; what are the challenges militating against the maintenance of government vehicles.

Findings: All the respondents said that finance is their major challenge when it comes to the maintenance of the school vehicles. They said that, even though they receive grant from the government for maintenance activities in the schools, the government delayed it payment. According to them the grant is also inadequate so most a times they rely on their internally generate funds (IGF) and the Parent Teacher Association (PTA) for support.

A bout 90% of the respondents said that, they are not allowed to levy the students for the maintenance of the school buses. So sometimes the buses breakdown and because of the high cost of repairing them, they are left unattended to.

Also, most of the respondents lamented about the challenge of having to send their buses all the way to Accra for servicing, coupled with a very high cost of servicing by Svani motors supplies of Eicher buses because the company has no servicing centers in the regional capitals.

Furthermore about 65% of the respondents who are school Heads mentioned that the attitude of some school drivers towards maintenance is a challenge to them. And that most of them do not follow the basic routine maintenance checks on the vehicles which sometimes results into major breakdown.

CHAPTER FIVE

DISCUSSIONS ON THE FINDINGS

Introduction

In this chapter, significant novel findings are identified, interpreted and discussed .The discussions focuses on the major findings of the research and draws inferences from them by comparing them to other previous studies.

Discussions

Maintenance as an activity is important in every organisation because it support the business performance of the organisation to ensure that the structure, system and equipment are in good condition as being stated by Wordsworth (2010). But from the information gathered, it is an undeniable fact that maintenance of government vehicles in senior high schools is faced with some challenges.

From the findings in chapter four (ref. table 4.12) 90% of the respondent admitted that they have a maintenance plan that they work with. This confirm what Adrelia (2007) said. According to Adrelia(2007) an efficient and effective maintenance requires detailed planning of repairs and services and that for each asset in the system, a maintenance plan is required. Having the plan is one aspect and implementing the plan is another. This is where most of the schools are challenged because the needed financial support to fully implement the plan is lacking.

Also the findings in chapter four (ref. table 4.12) shows that 85% of the respondents have maintenance policies in their schools which means that, there is a policy frame work or guidelines

to direct their actions when it comes to maintenance issues. This affirms what Wilson Alan (2002) asserted to. He said that an effective maintenance system should have a maintenance policy.

The findings from chapter four (ref. table 4.15) indicates that 85% of the schools do not have a decentralized body that respond quickly to breakdowns. Hence they do not achieve higher plant availability in their schools. This means that vehicle maintenance is discretional and that maintenance is done whenever the vehicles breakdown hence increasing maintenance cost and reducing institutional productivity.

According to Levitte Joel (1997), in maintenance organisation a decentralised structure would probably experience a lower utilisation than a centralised one but would be able to respond quickly to breakdowns and would achieve higher plant availability. On that basis, there is the need to encourage the decentralization of maintenance activities in the schools.

15% of the schools have a decentralised structure that responds quickly to breakdowns. This affirms what Levette Joel said. Also findings from chapter four (ref. table 4.10) indicated that 95% of the respondents who are school Drivers said they have a maintenance schedule for the buses they drive. This means that maintenance activities are carried out as ascribed in the maintenance schedule hence reducing frequent breakdowns on the road and indirectly reducing the cost of repairing the buses. This affirms what Levitte Joel (2007) asserted to. He said a maintenance schedule which is a mechanism for planning and scheduling the work and feeding back the information that is needed for correctly directing the maintenance effort towards defined objective.

The information gathered from the respondents also confirms what Kelly Anthony (2006) said. He suggested that preventive maintenance should be adopted by all. This includes maintenance

actions such as inspection, lubrication, cleaning, adjustment and replacement are under taken at fixed intervals of hours or kilometers. It can also be seen from table 4.15 in chapter four that, on research question 3, all the respondent representing 100% said, finance is their major challenge with regards to the maintenance of the school vehicles.

Even though they receive grant from the government for maintenance activities, it is inadequate and it delays in coming. Most of the respondents who are Headmasters said, at times they fall on the schools Parents Teachers Association for help. Because of this phenomenon some school vehicles have been abounded due to non-availability of funds to repair them.

However, findings from chapter four (ref. table 4.8) on research question 1, respondents were asked if they have an Asset Register in their schools. 90% of the respondent said they have. This confirming what Adrelia (2007) said. He suggested that in maintenance management and Administration there is the need to have an Asset Register to help provide rapid access to information to ensure that relevant data is always available and has not been misplaced. This will also enable the centralization of data for use in planning maintenance work.

Findings on qualitative responses on research question 3 indicates that even though there is a maintenance plan for the new Eicher buses and Mahindra 4×4 vehicles given to the schools, it is difficult for the schools to follow the plan due to the fact that these vehicles have to be taken to svani company in Accra for servicing coupled with very high charges. Hence they prefer going to the road side Mechanic for servicing. In effect they compound the problem.

On research question 1, respondents were asked if they keep records on maintenance activities. 90% of them said yes. This affirms what Kelly Anthony (2006) asserted to. He said, one of the major functions of a maintenance system or department is record keeping.

Further qualitative responses on the same question revealed that 10% of the respondents have challenges in record keeping hence the need for frequent training workshops for them to be efficient.

CHEPTER SIX

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

Introduction.

This chapter seeks to summarize the research in terms of the research questions, methodology and recommendations as to the challenges of maintaining Government vehicles in Senior High School.

Summary of Findings

This research assessed the maintenance culture of Government vehicles in Senior High Schools. It was found that maintenance management and administration structure exist in the schools but the system is not allowed to work or function due to financial constraint and administrative lapses.

In most of the schools, the attitude of the school drivers towards maintenance was not the best. Most of them overlooked the basic maintenance practices that needed to be carried out periodically. It was revealing that the new buses (EICHER) given to the schools come with a maintenance plan, where after a certain period they must be taken to the company that supplied them for servicing. This most of the schools do not comply with instead take the buses to road side mechanics for servicing hence compounding their problems. Also the Government grant given to the schools for maintenance activities is inadequate, so in case of major breakdowns the schools appeal to their P.T.A for assistance. In cases where the P.T.A too cannot help the vehicles are left unattended to resulting into further deterioration. The responses to maintenance activities by some of the Heads is worrying, most of them delayed in releasing funds for minor repair works

which later causes major breakdowns hence increasing maintenance cost which eventually the schools cannot afford.

Furthermore, the companies that supplied the Mahindra and the EICHER buses to the schools do not have servicing centers in the Regional capitals. This is a big challenge to the schools because they have to go Accra for servicing.

Conclusion

The maintenance of government Vehicles in Senior High Schools is faced with numerous challenges ranging from finance, management and administration. This is coupled with not a good posture towards maintenance by school Drivers and Administrators.

The establishment of a formalized maintenance department to be headed by a maintenance officer will help strengthen maintenance administration and management in the schools. Also Headmasters and mistresses should ensure that the policy guidelines given by the Ghana Education service on maintenance is fully implemented, monitored and supervised. This is necessary because maintenance is key in the development of every organization or institution especially in this current age of technology.

Recommendations

Based on the conclusions drawn from the findings, it is recommended that

1. Maintenance fund should be setup in the schools to take care of maintenance activities. This will ensure easy access to fund to carry out maintenance activities without delay.

2. A formalised maintenance department should be setup in the schools to be headed by a maintenance officer. This will allow the decentralisation of maintenance issues. Hence quick and faster responds to maintenance activities.

3. Companies that supply vehicles to the schools should establish service centers in the regional capitals to ease the burden of going to Accra for servicing. This will ensure easy access hence reducing the tendency of going to road side mechanics to compound their problems.

4. Frequent workshop and training on maintenance should be organized for school drivers. This will enhance their ability to undertake basic maintenance checks on the vehicles and also keep proper records on maintenance activities.

5. The GES should enforce the implementation of the policy frame work on maintenance in the schools by monitoring and supervision and also bringing to book Heads who fail to comply with the directive.

Suggestion for Future Research

I suggest that in future this research should cover all the schools in the Eastern Region of Ghana and the sample size be increased to 200.This will enable us make a conclusive general statement on the issues.

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UNIVERSITY OF EDUCATION-WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION

DEPARTMENT OF DESIGN AND TECHNOLOGY EDUCATION

QUESTIONNAIRE FOR SCHOOL DRIVERS

Dzineku Alexander is my name. I am a final year Post Graduate Student of the university of Education Winneba-Kumasi campus pursuing a Master of Technology Degree in the Department of Design and Technology Education. The questionnaire seeks your view on the maintenance culture of government vehicles in senior high schools and it is purely for academic purpose. You are assured of confidentiality so please answer the questions as frankly as you can by ticking [√] or marking appropriately in the of box provided.

(1) **Sex**

(a) Male [ ]

(b) Female [ ]

(2) **Age**

(a) 18-25 [ ]

(b) 26-30 [ ]

(c) 31-35 [ ]

(d) 36-40 [ ]

(e) 41-45 [ ]

(f) 46-50 [ ]

(g) 51 and above

(3) **Academic qualification**

(a) MSLCE [ ]

(b) SSSCE [ ]

(c) GCE „O" Level [ ]

(d) GCE „O" Level

(e) NVTI [ ]

(4) How often do you wash the car?

(a) Weakly [ ]

(b) Every 2 weeks [ ]

(c) Monthly [ ]

(5) How often do you change the engine oil?

(a) Monthly [ ]

(b) Every 2 month [ ]

(c) After the required mileage is covered [ ]

(d) As when I deem fit [ ]

(6) How often do you take the car to the mechanic for maintenance checks?

(a) Monthly [ ]

(b) Every 2 month [ ]

(c) Quarterly [ ]

(d) When it breaks down [ ]

(7) Do you park in a garage?

(a) Yes [ ] (b) No [ ]

(8) Do you have a maintenance committee in your School?

(a) Yes [ ] (b) No [ ]

(9) Do you have a maintenance schedule for the vehicle you drive?

(a) Yes [ ] (b) No [ ]

(10) Do you follow the daily routine maintenance checks?

(a) Yes [ ] (b) No [ ]

(11) Do you normally experience breakdown on the road?

(a) Yes[ ] (b) No [ ]

(12) If yes, how long does it take management to move it from the road?

(a) 1 day [ ]

(b) 2-5 days [ ]

(c) A week [ ]

(13) In the event of breakdown, how long does it take management to repair it?

(a) 1-5 days [ ]

(b) 1 week [ ]

(c) 1 month [ ]

(d) 1-2 month [ ]

(14) How is the response of management to maintenance issues?

(a) Poor [ ]

(b) Fair [ ]

(c) Good [ ]

(d) Very Good [ ]

(15) Do you have access to qualified mechanic?

(a) Yes [ ] (b) No [ ]

(16) Is management ready to buy genuine parts?

(a) Yes [ ] (b) No [ ]

(17) What is your major challenge?

(a) Late release of funds for maintenance? [ ]

(b) Unavailability of genuine parts [ ]

(18) Do you know about preventive maintenance?

(a) Yes [ ] (b) No [ ]

(19) Have you ever had any training on maintenance?

(a) Yes [ ] (b) No [ ]

(20) Do you have a tool box for basic maintenance checks?

(a) Yes [ ] (b) No [ ]

(21) Do you keep records on maintenance activities?

(a) Yes [ ] (b) No [ ]

(22) Do you have an asset register in your school?

(a) Yes [ ]

(b) No [ ]

(23) Any other comments

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Thank you.

UNIVERSITY OF EDUCATION-WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION

DEPARTMENT OF DESIGN AND TECHNOLOGY EDUCATION

QUESTIONNAIRE FOR HEADS OF SCHOOLS

Dzineku Alexander is my name. Iam a final year Post Graduate Student of the university of Education Winneba-Kumasi campus pursuing a Master of Technology Degree in the Department of Design and Technology Education. The questionnaire seeks your view on the maintenance culture of government vehicles in senior high schools and it is purely for academic purpose. You are assured of confidentiality so please answer the questions as frankly as you can by ticking [√] or marking appropriately in the of box provided.

(1) **Sex**

(a) Male [ ]

(b) Female [ ]

(2) **Academic qualification**

(a) First Degree [ ]

(b) Second Degree [ ]

(c) Doctorate Degree [ ]

(3) Do you have a maintenance unit in your school?

(a) Yes [ ]

(b) No [ ]

(4) Do you have a maintenance plan for school vehicles?

(a) Yes [ ]

(b) No [ ]

(5) Do you have a maintenance policy?

(a) Yes [ ]

(b) No [ ]

(6) Do you practice preventive maintenance?

(a) Yes [ ] (b) No [ ]

(7) How do you finance maintenance activities?

(a) Support from government [ ]

(b) Internally generated fund (IGF) [ ]

(c) Donations [ ]

(8) What difficulty do you have in maintaining the vehicles?

(a) Finance [ ]

(b) Lack of personnel [ ]

(c) Lack of genuine parts [ ]

(9) What is the attitude of your drivers towards maintenance?

(a) Poor [ ]

(b) Fair [ ]

(c) Good [ ]

(10) Do you have decentralized structure that respond quickly to breakdowns?

(a) Yes [ ]

(b) No [ ]

(11) Do you have funds set aside for maintenance?

(a) Yes [ ]

(b) No [ ]

(12) Do you organize maintenance workshops for your drivers?

(a) Yes [ ]

(b) No [ ]

(13) If yes how often?

(a) Monthly [ ]

(b) Termly [ ]

(c)Annually [ ] (d)As when deem it fit. [ ]

(14) **Do you have an asset register in your school?**

(a) Yes [ ]

(b) No [ ]

(15) **Any other comments**

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Thank you.