

**THE CHALLENGES OF MODERN AUTOMOBILE WORKSHOP AND THE  
TRAINING STRATEGIES FOR ROADSIDE MECHANICS IN LAGOS STATE**

**BY**

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## **CERTIFICATION**

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Name

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Signature

## APPROVAL PAGE

This project has been read and approved as meeting the requirement for the award of B.Tech. degree in Industrial and Technology Education of the department of Industrial and Technology Education, School of Science and Science Education, Federal University of Technology, Minna.

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Supervisor

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Signature - Date

## **DEDICATION**

This project is specially dedicated to my father MrKazeem Salami, my mother Mrs Florence Salami, my brothers and sister.

## **ACKNOWLEDGEMENT**

My greatest thanks goes to God almighty, who has protected, provided and guided me throughout my course of academic pursuit and sustained me through His infinite love. My profound gratitude goes to my supervisor, Mallam Garba Aliyu Usman who despite his schedule, still created time to read, criticize, correct and gave useful suggestion which contributed to the successful completion of this project.

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## **ABSTRACT**

This project was designed to investigate the challenges of modern automobile workshops, and the training strategies for roadside mechanics in Lagos state. To carry out this study three research questions were formulated. A survey research design was used for the study. The population of this study consisted of 56 respondents, 40 automobile mechanics and 16 car owners from modern automobile workshops in Lagos state. A questionnaire containing 30 items was developed and validated by three experts from the Department of Industrial and Technology Education FUT Minna. The data collected was analyzed using mean and standard deviation. The findings revealed that part of the challenges faced by modern automobile workshops in Lagos state, is as a result of the low interest of the government to invest in the automobile industry, it also revealed that modern automobile workshops are not well patronized because they are seen as a place for only the rich. It was recommended that government should make special programmes which collaborates both the roadside mechanics and the modern automobile workshops, it was also recommended that relationships between car manufacturers and the automotive industries in the country should be encouraged.

# CHAPTER 1

## INTRODUCTION

### **Background of study**

Maintenance of modern cars has become a major challenge to the service mechanics. Apparently, it is upon this (maintenance) that the life span of the automobile depends to a great extent. According to Narayan (2004), maintenance is a set of preventive, corrective or breakdown rectification activities. Olaitan, Nwachukwu, Onyemachi and Ekong (1999) defined maintenance as taking specific approved steps and precautions to care for a piece of equipment or machinery and ensure that it attains its maximum life span. These maintenance services should be carried out in an automobile workshop, which is defined as a place where cars are repaired and serviced (Wikipedia, 2012). The modern automobile workshop is a workshop which incorporates the use of sophisticated computerized to diagnose modern vehicles before repair work is carried out. In Nigeria modern workshops are faced with challenges, which include; planning issues and availability of equipment and parts. In the area of availability of parts and equipment the modern automobile workshops have a hard time to liaise with the automobile manufacturers to make available the automobile parts in a direct link to ensure quality of product specification. Sometimes the spare part dealers due to illiteracy and urge to sell their parts they supply wrong parts with the intension of convincing the automobile technicians to amend the parts and manage them, this act alone causes either delay in providing services or provision of substandard service. This lack of communication brings about the use of “second hand” parts which brings about the poor warranty policies of the local modern automobile workshops. The modern automobile workshops face problems with planning in areas such as expansion to cater for demands of the automobile services. Automobile workshops are medium scale industries which are usually limited to their start up size therefore there is growth and development in the company, for example in the whole of

Nigeria there is no modern automobile workshop registered as a public limited liability company as we have other small and medium scale companies grow into public liability companies.

In Nigeria modern automobile workshops are being looked at as a place where only the rich class people should visit to get quality repairs of their cars because of the processes employed by the workshops to ensure quality services (Ukwu and Ajobiewe). This mentality is created because in some of the modern automobile workshops the staffs are trained literates and require a higher salary scheme and therefore the company has to add charges to the services to keep up to the needs of the staffs.

Since the site location has a large influence on the success of the garage, careful consideration must be given to the selection of site location. Moreover, since the publicity effect is large, site selection is something which contributes to the overall expansion of the company. It should face a main road (or be close to a main road), it should be on a level ground, It should be a location where there are no traffic delays, It should be possible to secure and adequate surface area, it should be a location with room for expansion, it should be a location where public facilities can be used, it should be a location without legal restriction, the soil base should be suitably firm.

The modern automobile workshops face competitions from the roadside mechanics due to cost implication it drives the customers up and down between the modern automobile workshops and the roadside mechanics instead of quality motivation. The training of roadside mechanics in Nigeria has proven quite challenging basically because cost implications have enabled roadside mechanics to receive patronage thus making the need for training seem futile to the roadside mechanic themselves. Therefore strategies have been organised to help achieve the effective training of roadside mechanics;

better insurance policies on automobiles which require certified personnel's sign off on every automobile, government regulations on environmental impact of waste management should be stringent to cover oil spills and other solid waste caused by roadside mechanics, technical colleges should restructure and make provision for training and retraining of roadside mechanics, enlightenment seminar should be organised for both automobile owners and roadside mechanics to foster proper automobile maintenance habit and discourage roadside operations.

Roadside mechanic is a mechanic who specializes in automobile repairs, maintenance, and sometimes modification. A roadside automobile mechanic may be knowledgeable in working on all parts of a variety of car makes or may specialize either in a specific area or in a specific make of car for instance he/she may specialize on BMW, Toyota, Ford, Chrysler etc. In repairing cars their main role is to diagnose the problem accurately and quickly. They often have to quote prices for their customers before commencing work or after partial dismantling for inspection. The mechanic uses both electronic means of gathering data. Their job may involve the repair of a specific part or the replacement of one or more parts as assemblies.

With the rapid advancement in technology, the mechanic's job has evolved from being purely mechanical technology, because vehicles today possess complex computer and electronic systems, mechanics need to have a broader base of knowledge than in the past.

Lately the term automobile mechanic is being used less and less frequently and is being replaced by the title automotive service technician.

## **Statement of Problem**

The rate of rapid technological advancement in the automobile industry has warranted for the need to have well equipped modern automobile workshops in Nigeria, to carry out repair and service work on automobiles. These modern automobile workshops face challenges which range from lack of equipment needed in the workshop to lack of genuine spare part supply to the workshops, this leads to the use of “second hand” parts which result in poor warranty policy of the parts available. This challenge is caused by lack of rapport between the modern automobile workshops in Nigeria and the car manufacturers.

The same advancement in the automobile industry has made it impossible for the normal trial and error employed by the roadside mechanic to be futile, this has made the training and retraining of automobile mechanics imperative. Therefore roadside automobile mechanics have to meet up with the technological advancements in order to repair modern automobiles effectively. Roadside mechanics must be equipped with basic computer skills to enable them use the computerized tools needed to carry out diagnosis before the necessary repair work is carried out (Malone, 2006).

## **Purpose of study**

The purposes of this research study are to:

1. Identify the challenges of the modern automobile workshop.
2. Identify the effective strategies for training roadside mechanics.
3. Find the causes of inadequacy of tools and equipment.

## **Significance of Study**

The findings of this study if implemented will be of immense benefit to serving roadside mechanics, Automobile students apprentices, vehicle owners and the government. The

findings of this study will be of benefit to the roadside automobile mechanics, by retraining them on how to use modern equipment to diagnose and repair faults in modern automobiles. This study will serve as a source of reference for those who are interested in related research work. The study will help students acquire good skills and work experience from the workshop during their Student Industrial Work Experience Scheme (SIWES).

### **Scope of the Study**

This study is determined to identify the challenges of modern automobile workshops and to identify strategies which can be used to train roadside mechanics in Lagos state. The study will also determine the causes of inadequacy of tools and equipment in modern automobile workshops. This research will be carried out in Lagos state due to time, financial and logistic constraints.

### **Assumption of study**

The following assumptions are inherent to this study;

1. The personal interests of the respondents will not affect their honest opinion on the questionnaire item.
2. The validated results of the study would be used to improve the modern automobile workshop standards and make them provide better services.

### **Research Questions**

The following research questions were drawn from the purpose of this study as shown below;

1. What are the challenges of modern automobile workshops?
2. What are the training strategies for roadside mechanics?

3. What are the causes of inadequacy of tools, equipment and automobile workshop organization and management?



## **CHAPTER 2**

### **REVIEW OF RELATED LITERATURE**

The literature related to this study is reviewed under the following subheadings.

1. The development of automobile workshop.
2. The evolution of automobile industry in Nigeria.
3. Review of well-equipped automobile workshop.
4. Problems affecting automobile training.
5. Origin of apprenticeship/artisan training.
6. Need for standardizing programme of artisans skill for effective maintenance of automobile..
7. Artisans and modern changes in the automobile industry.
8. Challenges for modern mechanics.
9. Methods of standardizing auto mechanic programme
10. Organization and management of an automobile workshop department
11. Desirable equipment
12. Summary of literature review

#### **The Development of Automobile Workshop**

At the beginning man travelled from one place to another by foot and carried his load on his back or head. He found out that he could not travel long distance on foot without getting exhausted.

He started using animals like donkey, horse, camel etc to travel on and also carry his load he was not still satisfied with that and later on he developed wheels and carts on which he carried both humans and loads. With this method he carried more humans and heavier loads with ease as the animal is placed in front of the cart to pull it without getting tired as before

but he was still not satisfied. Then he decided to invent cars, in 1769 the first cars were powered by steam engines. Later on in 1806 cars were then powered by internal combustion engines running on fuel gas. This led to the introduction of gasoline engines in 1885 and later diesel engines were produced. At present the majority of people in developing countries are not adequately served by transport systems. In rural areas most people lived at a considerable distance from a conventional road and in spite of great efforts to develop rural road networks, there is little hope that an optimal road density will be needed in the foreseeable future. Moreover even in areas where settlements have road access the economic conditions do not permit a large increase in the use of conventional motorized vehicles on an extended road network.

Advance in technology has influenced the development of automobile. The production of automobile has also influenced where people live, work and how they spend their leisure time. These motor vehicles have life spans which they must live up to, so in order for them to live up to this expected life span they have to be well maintained and serviced, this maintenance and servicing must be carried out in a workshop. And an automobile workshop must be well organised and equipped with tools and machines that are capable of keeping the vehicles on road through good maintenance service rendered by skilled mechanics.

### **Evolution of Automobile Industry in Nigeria**

The automobile industry is an industry that designs, develops, manufactures, markets and sells the worlds motor vehicles (Wikipedia, 2009). The automotive industry is a central agent of creating and managing patterns of technological change or innovation. In Nigeria, the 1970s was a turning point in the development of automobile industry. By this time, government had become aware of the importance of the industry as an engine of growth in economy. Given this strategic importance, government become involved in the sub sector

essentially to aid their integrated developments that will stimulate the growth of the indigenous automobile know how. This led to establishment of Peugeot Automobile of Nigeria (PAN) which assembled cars like 204, 304, 305, 404, and 504, and the Volkswagen of Nigeria (VON) which assembled the Volkswagen beetle and Passat cars that are affordable to average Nigerians during General Gowon's administration. The third national development plan (1975-1980), provided further establishment of commercial truck plants such as Leyland Nigeria Ltd. Ibadan, Anambra Motor Manufacturing Co. Ltd (ANAMCO), National Truck Manufacturing Ltd. (NTM) Kano, and Steyr Nigeria Ltd. Bauchi. Salami, (2007).

The establishment of these assembly plants in the country was mainly to meet the nation's demand for vehicles to counter our transportation problems for both human and goods. They also help the country to save foreign reserve that could be used for other projects instead of purchasing vehicles from abroad and also to earn us foreign currency by exporting to other countries if the local assembly plants could be able to meet our local demands. The establishments of these plants are also to facilitate technological transfer from the parent companies to Nigeria to help us develop our own automobile technology.

Consideration was also given to private individuals and organizations such as SCOA MOTORS, General Motors Nigeria Limited (GMNig) etc. to establish plants to assemble vehicles alongside those installed earlier to attain the stated objectives of the local assembly plants.

The assembly plants performed fairly well in the 1970s as Nigeria economy was relatively good. But due to unfavourable government policies all the automobile plants set up in the 1970s closed down except Peugeot Automobile of Nigeria (PAN). The formulation and adoption of the national policy in 1993, and subsequent establishment of the National Automotive Council (NAC) represented a landmark in the development of automobile

industry in Nigeria. At this time, the automotive industry is regarded as an engine of growth whose establishment serves as an important stimulus to other types of manufacturing activities because the industry has capabilities to create many job opportunities and generate acquisition of technology.

### **Review of a Well Equipped Automobile Workshop**

Weber (1983) noted that one of the greatest joys of being an automobile technician is that of owning and using tools. There is something satisfying about using just the right tools for a particular job. A technician's tools are as important as his hands and mind. A technician cannot make a living without them.

Anyone who is truly sincere about a profession as an automobile technician will buy the best tools he or she can afford. Cheap tools may be fine for a person who carries out minor repairs around the house, but the professional mechanic relies on his or her to make a living. The tools will be used many times during the course of a single day, and must be able to endure constant use. Poor quality tools are a waste of tools and money.

Very few mechanics or shops can cope with enormous array of special tools required and often the worn tools are used to do the job. This results in the damage to the parts, or worse yet unsatisfactory repairs. Few mechanics were willing or able to pay for the multitude of costly special tools to service every different make and model of vehicle.

According to Bernard (1975) "the size of workshop and the amount of work expected will have a strong bearing on the equipment to be purchased". No workshop can be efficient without suitable tools and equipment. The service station owner, service manager or other responsible person will decide which equipment is necessary as an aid to efficiency and

profundity in a workshop. An entirely new layout gives a great opportunity for careful selection and planking of equipment to obtain maximum productivity from the repair shop.

### **Problems Affecting Automobile Training**

Nigerian youths are facing myriad challenges but the government does not pay attention to their plights. Many of those who dropped out of secondary school and those who managed to pass through lack the skills to compete in the rather weak economy and tight labour market. Therefore they loiter around from dawn to dark while battling with crushing unemployment and poverty. However the government could improve their sordid state by creating jobs and increase the funding of vocational and technical education from where they could acquire some skills and learn lifelong trade.

Vocational education is designed to offer training to improve individuals' general proficiency, especially in relation to their present future occupations. The provision of vocational and technical education in secondary and post-secondary schools has a long history. Before the industrial revolution between (1750 and 1830), the home and the apprenticeship system (Duffy 1967) were the principal sources of vocational education but societies were forced by the decline of handwork and the specialization of occupational functions to develop institutions of vocational education. Nevertheless manual training, involving general instruction in the use of hand tools was said to have developed initially in technical vocational schools in Nigeria.

### **Origin of Apprenticeship/Artisan**

The system of personal master apprenticeship instruction, itself has an adaptation of the primeval father-son tutorial relationship still practices in Africa and Asia had its roots in the

middle class guides or corporation of the early middle ages. In Europe apprenticeship was a function of the autonomous guilds and not for the state.

Handcraft occupations under the apprenticeship system included building craft, boot and shoe making, printing and rural craft have survived into modern times. For these trades the artisans system in European countries were usually of a three year personal master apprentice contract with classes which were evening instruction in classes which were provided under the educational authorities. However, by the onset of the industrial revolution in Europe, in the nineteenth century the original apprenticeship system had began to weaken (Warren, 1967).

The apprenticeship system though often described as mans oldest method of learning skills has metamorphosed from an earlier method known as the initiation method of learning.

UNESCO, (1984) defined apprenticeship as a period of long time training substantially carried out with an undertaking and negated by statutory law or custom according to oral written contract which imposes mutual obligations on the two parties concerned. The trainee and normally an employer who has assumed responsibility for giving the trainee initial training for recognized occupation subject to apprenticeship. Apprenticeship system is a non formal school education, because it is a non organised series of learning activities acquired outside the formal school system. It is therefore an agreement to train the learner for a specific trade like auto mechanic, auto electrician etc. under this system the tradesman learn their trade by imitation and repeat performance approached.

### **Need for Standardizing Programme of Artisans Skill for Effective Maintenance of Automobile.**

It is generally accepted that the state of ill maintained cars and machineries is a clear testimony that most of the automobile artisans are not up to standard towards the maintenance

of automobiles. There is need therefore to standardize the programmes of automobile artisans for effective maintenance of automobiles. By equipping the automobile artisans with the skills and knowledge required by the society, makes it possible for automobile artisans to meet the standard required by the society towards the maintenance of automobile.

### **Artisans and Modern Changes in Automobile Industry.**

It is obvious that the issues of providing automobile artisans with appropriate knowledge and skills with which to live and function in today and tomorrow would work present certain strategies for technology education for automobile artisans. Changes in technology has given rise to training and retraining needs of automobile artisans, and such needs can be met with considerable success if appropriate planning of technology education programme are undertaken to facilitate and update the skills and knowledge of automobile artisans to suit the modern changes in automobile technology.

New ways of naming things, new products and new methods of manufacturing are affecting repairs and maintenance services in automobile industry and continually causing changes in the kind of jobs available to automobile artisans. This process of change calls for a broad foundation of formal training and education of automobile artisans, so that if a shift in plans become necessary a transition from one occupation or field of work to another may be easily accomplished. It is therefore important for the automobile artisans to understand the dynamic changes that are going on in an economy and society as a whole, which affects repairs and maintenance service in the automobile industries. There is need to update and modify the programmes offered in our trade training centres for automobile artisans from rigid traditional occupation to the ones designed to provide skills and ability for easy adaptation to new situations, ones in which knowledge and skills acquired can be applied under changing conditions.

## **Challenges for Modern Mechanics**

Galiegue, B.F (1982) in his test “service management in retail motor industry” says “To make a successful cake one must first have the right ingredients and the rest of the exercises depend on the skill of the operator. In the same way, to operate a profitable service station, a higher trained workshop staff capable of satisfying the need of the market and providing a reasonable profit are necessary”.

Only those who will learn and understand the principle involved and those who get the training and the real mechanics will be those who devote their energy to being the best in their fields. It takes time, drive, energy, desire and inquisitive like a doctor, lawyer, or business executive, the professional automotive service technician is a triad , discipline workers who must continue to learn all through the career.

According to Webber (1983) “Mechanics are the people who keep all those vehicles running “ unfortunately, the term mechanic has some negative connotations. Too many people have some impression that mechanics are like, too often portrayed on television as matriculate, simple bumbling idiots. The automotive technician (mechanic) is no less a professional than the computer repair technician or television repair technician. It is a profession of which one may be proud of. Without the professional automobile service technician, the country’s transportation would come to a screeching halt. The automobile industry is responsible for getting the part and tools to the right places at the right time with the right people to make the right repairs.

We demand quick and proper repairs for our vehicles; we deserve it when we part with our money. Webber (1983) noted that “an auto repair mechanic or technician, is an important and valuable commodity, and deserves our respect”.



Times and cars have changed, there are of course a few who think it is still possible to get in to the field of automobile repair by the trial and error method. It is not likely however that a person can hold a position of respect or advance without adequate formal training. The self trained mechanic usually becomes known as a “part changer” because all he does is change parts and not actually diagnose and fix problems. May the person has an aptitude for thing that are mechanical and perhaps is also good with both hands, but an untrained person will never become a reliable and discipline automobile technician.

Wilcox (1973) when commenting on the challenges facing the modern automobile garages says. “with the ongoing and predicted advances being made by the car manufacturers research and development engineers, service technicians are meeting new challenges each year at the same time the need is being created for new kind of specialist in the areas of electronics and engine control unit, etc.

Modern automobile workshop personnel should be trained using the proper procedure so that they may be able to cope with the development of motor vehicle industries and to meet the needs for trained service technician. According to Wilcox (1973) “every year new model automobiles have new devices and features. It is becoming more difficult for mechanics to master the service repair of the entire car”.

The professional mechanic must learn and apply his/her trade in a formal manner. This means learning the right way not the trial and error method. Nothing can replace formal training now in the automobile arena; the trend is towards the specialist. Just a quick look at the telephone directory reveals that there are specialists in suspension, brakes, transmission, exhaust, and diesels for autos and trucks, tune-up specialists, body repairs and painter and even management.

Specialization is the wave of the future, it is important for any technician to take a holistic to automotive repair. No specialist can live in a work of his or her own. The automobile technician must be able to see and understand the interrelationship existing between all part of the vehicle and integrate them into the whole. Although specialization may be the trend, it is important for the technician to understand the operation of all the other systems in the automobile, heavy equipment or truck.

As a mobile society, we will always need qualified people to repair our vehicles when they breakdown. Perhaps we won't recognise the cars of the future. They may be powered by gasoline, solar energy, propane, electricity, alcohol.

### **Method of Standardizing Auto-mechanic Programme**

The method of workshop organisation; this method involves acquisition of work experiences through the interaction of the number of people who possess different experiences and techniques using. It involves planning a workshop, preparation, workshop practices and delivery for the purpose of solving a problem in a specific trade.

This method if properly exploited will help the auto-mechanic trainee to develop the work experiences on his own through practice. According to Andah (1988), apprenticeship comprises of instruction in techniques and knowledge, calculating individual in perception, intelligence, memory and social education which ensures the maintenance of the statuesque for the stability method to be standardizing programme. Auto-mechanic is the direct learning method. These methods provide the auto-mechanic trainee the opportunity to acquire functional skills in specific trade on the job and techniques increasing the efficiency and improve their standard of living.

A meaningful training is said to be systematic and geared towards achieving clearly defined objectives Jacob (1996) he further stated that training as a continuing process at all stages of man's life effective learning is the development of the individual of those knowledge, skills attitude which are related directly to the job in context.

Third method to be adopted towards standardizing auto-mechanic is the "link course models" the link course model is an aspect of co-operative training method for assisting auto mechanics trainee gain educational knowledge and vocational skill. It is a training model that facilitates trainee educational awareness through the co-operation of educational institutions may be special, high filed study centres, technical school colleges of technology and universities. According to Wahab (1999) vocational and technical educational and technical education. A modernization of the apprenticeship system can be linked to the challenges posed by new world order of technological development. A renewed interest in the apprenticeship system for its improvement to enhance technology education is imperative. It is argued that effective management of apprenticeship experience can produce experts in the technological field. Government should fund vocational and technical education appropriately and look into the modern apprenticeship system capability of turning around the country's technological education.

### **Organization and Management of an Automobile Workshop Department.**

According to Benard (1975) "a service station cannot be ran on a bit of miss basis and work must be planned ahead and handled in a systematic manner if it is to function consequently, a service manager must organize his own duties and how often these need attention. For an automobile shop to function efficiently departmental relationship cannot be overemphasized. Automobile workshop should have its department based on its function. The following

information concerning the relationship of each department in an automobile workshop setup to achieve viability was provided by Galigue (1982).

### **The Service Department**

The function of this department is to satisfy the customer's needs for repair and services and to offer advice to the customer when requested. The sales department is probably one of its greatest customers and every effort should be made to carry out new vehicle preparation promptly and to a high standard to devise the same department of every opportunity to make a sale and to carry out warranty work as and when required.

### **The Sales Department**

Apart from this department's responsibility to sell new and second hand vehicles it should also:

- Notify the service department of all sales, allowing time to carry out the preparation for delivery without disorganizing the flow of work.
- Supply the service department with full demand of the fall sales and introduce new customers to the service department.
- Ensure that customers are fully aware of the facilities offered by the service department.

### **The Parts Department**

There is no doubt that in most organisation the service department is the best customer of the parts department and the effective operation of this department will depend on:

- The promptness with which replacements are issued to the mechanics.
- Notification of slow moving parts in order to increase the turnover.

- Notification of parts which are in short supply.
- Operation of replacement under warranty system.

### **Desirable Equipment**

Any piece of equipment will increase production or raise the standard of the work done can be considered desirable and where a request comes from the workshop floor it may be prompted by a desire to;

- a) Offer a service which is not available elsewhere in the area.
- b) Speed up an existing operation.
- c) Increase the profitability of an operation.
- d) Increase the volume of the sale of replacement.

The list that follows mentions many of the important items other than small tools that a modern service station should possess, followed by additional equipments for the larger workshop. An independent operator, however will choose for himself the tools and equipment listed below what exactly suits his needs.

### **Motor Vehicle Workshop Equipment:**

- Car lift
- Axle stand
- Hydraulic jack
- Lubrication bay
- Plug cleaning and testing equipment
- Battery charging and testing equipment
- Vacuum gauge
- Wheel balancer

- Decelerometer
- Valve reseating kit
- Compression gauge
- Tyre repair equipment

#### ADDITIONAL EQUIPMENT

- Camber, castor, and king-pin alignment gauge
- Brake bleeder and filler
- Tyre spreader and changers
- Chassis alignment equipment
- Tyre test tank and vulcanize
- Drill machine
- Healam beam checker
- Valve grinder
- Con-rod boring and aligning equipment
- Stroboscope
- Carburettor and fuel pump testers

#### **Summary of The Literature Review**

So far in this chapter we are exposed to innovation and development technology of automobile vehicle and job security of roadside mechanics. We also were exposed to the importance of the tools and equipments in an automobile workshop, we talked about the problems affecting and hindering automobile training. We talked about the organization and management of an automobile workshop. The system of personal master apprenticeship

instruction, itself has an adaptation of the primeval father-son tutorial relationship still practices in Africa and Asia had its roots in the middle class guides or corporation of the early middle ages.

## **CHAPTER 3**

### **METHODOLOGY**

This chapter describes the research design, area of the study, population, sample study and instrument for data collection, and validation of the instrument and method of data analysis.

#### **Research design**

The study was conducted using a descriptive survey research design. A descriptive survey research can be defined as a descriptive study in which the entire population or respective sample of the entire population is studied by collecting and analysing data from the group through the use of questionnaire. This design is suitable since the study solicited information from the individuals who patronize modern automobile workshops and roadside mechanics, the mechanics that actually work in the workshops, some workshop owners in Lagos state.

#### **Area of study**

This study was carried out in Lagos state of Nigeria. Lagos state is located in the south-western part of Nigeria. It is arguably the most economically important state of the country, which has a large number of automobiles (Wikipedia, 2009).

The research was carried out in Mushin LGA which has the highest population of roadside mechanics. The following are the automobile workshops which information was gotten from; Smats automobile services Lagos state and Coscharis Lagos state Nigeria limited.

#### **Population**

The population of this study comprises of the general public which include(16) motor vehicle owners, who actually visit the automobile workshops, (40) auto- mechanics who work in the workshops.



These two groups that form the population are located in various areas in Lagos state.

### **Instrument for data collection**

The instrument used for data collection for the study is a questionnaire. The questionnaire was designed for the general public who visit modern automobile workshops and the auto technicians that work in the automobile workshops. The questionnaire items were formulated on four-point scale type. The questionnaire contained four responses. These responses were;

Strongly Agree                                 = SA

Agree   = A

Disagree   = D

Strongly Disagree                             = SD

These response categories were assigned numerical values of 4, 3, 2, and 1 respectively. The respondents were expected to check or tick against response category that best satisfied their opinion.

### **Validation of the instrument**

It is important to validate the instrument used for data collections so as to ensure that it measures what it is designed to measure. Therefore, the instrument used for this study was validated by the project supervisor and two other experts in the Department of Industrial and Technology Education.

## Administration of the instrument

The administration of the instrument to the respondents for collection of data was carried out personally by the researcher. This enabled the researcher to communicate with the respondent on the study.

## Method of data analysis

The data generated from the use of the instrument were analyzed using mean, standard deviation. The mean and standard deviation were used to answer research question 1-3, while the t-test was used to test the null hypothesis.

Four points rating scale was developed using:

Strongly Agree - SA = 4

Agree - A = 3

Disagree - D = 2

Strongly disagree - SD = 1

Acceptance level for the four points rating items are:

$$\frac{4 + 3 + 2 + 1}{4} = \frac{10}{4} = 2.50 \text{ above}$$

Mean

$$= \frac{\sum FX}{N}$$

Where

$\sum$  = Summation of values

X = Nominal values of option

$\bar{X}$  = Mean of each item

N = Number of respondents of items

F = Frequency of respondents of each option

The standard deviation (SD) for each group of respondent was computed using the formula

$$S. D = \frac{\sqrt{\sum f(x-x)^2}}{N}$$

N

Where SD = Standard Deviation

$\bar{X}$  = Mean of each item

X = Grand mean of all the items

$\sum$  = Sum of

N = Total number of items

### **Decision rule**

To determine the acceptance, a mean of 2.50 was selected as a cut off point, in other words any item with a mean response at 2.50 and above was considered accepted while items with less than 2.50 mean responses was considered unaccepted.

## CHAPTER FOUR

### PRESENTATION AND ANALYSIS DATA

This chapter deals with the presentation and analysis of data with respect to the research questions and hypothesis formulated and also the findings of the study are discussed.

#### Research Question 1

What are the challenges of modern automobile workshops?

**Table 1: Mean Responses of Car Owners and Auto-mechanics on the challenges of modern automobile workshops.**

$N_1=40, N_2=16$

S/N	ITEMS	$X_1$	$X_2$	$X_t$	REMARKS
1.	Modern automobile workshops are seen as a place for only the rich	3.63	3.38	3.50	Agree
2.	Modern automobile workshops do not have good rapport with car manufacturers to request for spare parts.	3.63	3.50	3.56	Agree
3.	The new spare parts produced by contracted manufacturers are not of high quality	3.63	2.94	3.28	Agree
4.	Spare parts don not have good warranty policy	3.70	3.31	3.51	Agree
5.	There is usually delay in supply of spare parts by suppliers	3.53	3.06	3.29	Agree
6.	There is no trust in mechanics by the customers which prevents the customer from releasing money to buy parts	3.70	2.75	3.23	Agree
7.	Bridge in communication between part suppliers and mechanics	3.55	3.75	3.65	Agree
8.	Poor workshop organization prevent the easy	3.33	3.38	3.35	Agree

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	flow of operations				
9.	Tools required for operations in new model vehicles are too sophisticated	3.85	2.75	3.30	Agree
10	Competition due to price difference between roadside mechanic and modern automobile workshops	3.60	3.38	3.49	Agree

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Key:

$N_1$ = Number of auto mechanics

$N_2$ = Number of car owners

$X_1$ = Mean score of the car owners      where  $X_t = \frac{X_1 + X_2}{2}$       \_\_\_\_\_

$X_2$ = Mean score of the auto-mechanics 2

$X_t$ = Average mean score of both groups

Table 1 reveals that the groups agree with items 1 to 10 with mean responses ranging from 3.23 to 3.65. Therefore, the result shows that the items agreed by respondents indicate that there are actually challenges in the modern automobile workshops in the country in Lagos state.

### **Research question II:**

What are the training strategies for roadside mechanics?

### **Table 2: Mean Responses of Car Owners and Auto-mechanics on the training strategies for roadside mechanics.**

$N_1=40, N_2=16$

S/N	ITEMS	$X_1$	$X_2$	$X_t$	REMARKS
11.	Technical colleges should restructure and make provision for training and retraining of roadside mechanics	3.78	3.69	3.73	Agree
12.	Policies which require certified personnel to sign off on any repair work carried out on a car before it is fit to be on the road should be created	3.88	3.50	3.69	Agree
13.	Partnership should be created between roadside mechanics and modern automobile workshops	3.95	3.38	3.66	Agree
14.	Enlightenment seminars should be organized for roadside mechanics to foster proper automobile maintenance habit and discourage roadside operations	3.25	3.75	3.50	Agree
15.	Government should make regulations on environmental pollution in other to make roadside mechanic seek knowledge for proper disposal methods.	3.73	2.44	3.08	Agree
16.	Government should provide programmes which collaborate the roadside mechanic with modern workshops to teach them of the new technology employed in new cars.	3.90	3.13	3.51	Agree

17.	Car owners should make sure that mechanics have a degree of technical educational background before releasing their vehicles.	3.65	3.44	3.54	Agree
18.	Government should provide scholarships for admission into technical colleges to enable interested individuals in automobile field have technical education background.	3.75	2.81	3.28	Agree
19.	Introduction of computer classes into technical programmes to stand as a stepping stone for the future encounter with computerized vehicle.	3.83	3.69	3.76	Agree
20.	Recruitment of workers from the roadside mechanics with educational background.	3.90	3.47	3.69	Agree

Key:

$N_1$ = Number of auto mechanics

$N_2$ = Number of car owners

$X_1$ = Mean score of the car owners where  $X_t = X_1 + X_2$

$X_2$ = Mean score of the auto-mechanics 2

$X_t$ = Average mean score of both groups

Table 2 reveals that the groups agree with items 11 to 20 with mean responses ranging from 3.08 to 3.76. Therefore, the result shows that the items agreed by respondents indicate that there are actually training strategies for training roadside mechanics in the country in Lagos state. This revealed that the mean responses of individuals and the motor vehicle mechanics

to all the items were greater than 2.50. this implies that all the items in table are actually relevant strategies for training roadside mechanics.

**Research question III:**

What are the causes of inadequacy of tools and equipment?

Table 3: Mean responses of car owners and auto- mechanics on the causes of inadequacy of tools and equipments.

**N<sub>1</sub>=40, N<sub>2</sub>=16**

S/N	ITEMS	X <sub>1</sub>	X <sub>2</sub>	X <sub>t</sub>	REMARKS
21	Inadequacy of financial services for the automobile industry in Nigeria	3.95	3.75	3.85	Agree
22	Some special tools that are available in the local outlets are extremely expensive	3.88	3.75	3.81	Agree
23	Most of the special tools have to be imported from overseas this causes discouragement to purchase them	3.78	3.5	3.64	Agree
24	Lack of technical knowhow in the use of special tools result in the damage of tools	3.75	3.88	3.81	Agree
25	Lack of maintenance facility of special tools in the country which results in sending the equipment overseas for repair	3.73	3.38	3.55	Agree
26	The government should invest more in the development of automobile workshops	3.6	3.44	3.55	Agree
27	Poor system of inventory control which gives room for carelessness of technicians	3.37	3.38	3.55	Agree
28	Improper planning of the workshop could lead to organizational deficiency	3.53	3.75	3.64	Agree
29	Purchasing of cheap tools with the purpose of saving money results in the purchase of low quality tools which do not last long	3.55	3.69	3.62	Agree



30	Seminars should be organized to appraise maintenance culture which helps in workshop organization	3.35	3.88	3.61	Agree
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Key:

$N_1$  = Number of auto mechanics

$N_2$  = Number of car owners

$X_1$  = Mean score of the car owners      where  $X_t = \frac{X_1 + X_2}{2}$

$X_2$  = Mean score of the auto-mechanics      2

$X_t$  = Average mean score of both groups

Table 3 shows that respondents agreed with items 21 to 30 with mean responses ranging from 3.52 to 3.85. Therefore, the result indicated that there are inadequacies of tools, equipments and workshop organization. And with the suggested measures in practice, the inadequacies will surely be reduced, if at all not completely abolished.

### Findings:

Based on the data collected, the following findings were reviewed under each research question;

1. What are the challenges of modern automobile workshops?
  - Both respondents generally agreed that;
    - a. Modern automobile workshops do not have good rapport with car manufacturers to request for spare parts.
    - b. The new spare parts produced by contracted manufacturers are not of high quality

- c. Spare parts don not have good warranty policy
- d. Modern automobile workshops are seen as a place for only the rich.
- e. There is no trust in mechanics by the customers which prevents the customer from releasing money to buy parts
- f. Tools required for operations in new model vehicles are too sophisticated

2. What are the training strategies for roadside mechanics?

- a. Policies which require certified personnel to sign off on any repair work carried out on a car before it is fit to be on the road should be created.
- b. Partnership should be created between roadside mechanics and modern automobile workshops.
- c. Car owners should make sure that mechanics have a degree of technical educational background before releasing their vehicles.
- d. Government should provide scholarships for admission into technical colleges to enable interested individuals in automobile field have technical education background.
- e. Introduction of computer classes into technical programmes to stand as a stepping stone for the future encounter with computerized vehicle.
- f. Government should provide programmes which collaborate the roadside mechanic with modern workshops to teach them of the new technology employed in new cars.
- g. Enlightenment seminars should be organized for roadside mechanics to foster proper automobile maintenance habit and discourage roadside operations.

3. What are the causes of inadequacy of tools, equipments and automobile workshop management?
  - a. Inadequacy of financial services for the automobile industry in Nigeria.
  - b. Most of the special tools have to be imported from overseas this causes discouragement to purchase them
  - c. Lack of maintenance facility of special tools in the country which results in sending the equipment overseas for repair
  - d. Lack of technical knowhow in the use of special tools results in the damage of tools
  - e. Purchasing of cheap tools with the purpose of saving money results in the purchase of low quality tools which do not last long.
  - f. The government should invest more in the development of automobile workshops.
  - g. Seminars should be organized to appraise maintenance culture, which helps in workshop organization.
  - h. There is lack of maintenance facility of special tools in Lagos this incurs more money as special tools are sent overseas for repairs.

### **Discussion on findings:**

The discussion of the findings were organized and presented in line with the research question.

The purpose of the study is to identify the challenges of the modern automobile workshop and strategies for training roadside mechanics and also find out the causes of inadequacy of tools, equipments and automobile workshop management and organization. The results in table 1 showed that the mean responses of the respondents with 3.23 and above. Items 1 to 10 all where agreed which shows that individuals are aware of the fact that the modern automobile workshops are experiencing some challenges and that these challenges can be

solved with the cooperation of both the government and the workshop owners. It was found out that the extreme price tags on the special tools available for purchase in the country is a major cause of tools inadequacy in automobile workshop. The result from table 2 showed by mean responses of the respondents. The statements from Items 11 to 20 were agreed to and this showed that the suggested measures have the potential of providing solution to the defective means of training roadside mechanics and this could actually reduce the level of illiteracy in the country.

The research showed that if government invests more in the maintenance sector of the automobile industry most of the workshop challenges would be solved and that special bank loan services should be provided to assist private individual and a strategized pattern in the manner of collecting interest should be provided to suit the nature of the job.

If the educational system is reviewed to favor individuals who choose to pick career options of the technical fields most the problems encountered by the roadside mechanics like their inability to operate tools as a result of maybe not knowing how to read instructions will be solved or reduced to the nearest minimum. It was also discovered that the inculcation of maintenance culture into the automobile technicians makes them more responsible and this act of responsibility helps in the organization of the workshop. Furthermore the organization of the workshop also assists in inventory keeping which minimizes the rate at which tools are misplaced this will also solve issues of tools inadequacy due to carelessness of the worker. The findings of this study have shown that the lack of maintenance facilities of special tool and equipments has a part to play in the causes of inadequacy of workshop tools. The Federal Government should make policies which should have the ability to make roadside mechanics seek additional knowledge to what they already know. This would reduce the amount of roadside mechanics thereby helping the nation in planning issues when it comes to environmental issues.

## CHAPTER FIVE

### SUMMARY, CONCLUSION, RECOMMENDATION AND SUGGESTIONS FOR FURTHER STUDIES

#### Summary of the Study

The purpose of this study is to identify the challenges of modern automobile workshop and the training strategies for roadside mechanics in Lagos state, related literatures were reviewed in the study under the following sub-headings; The development of automobile workshop, The evolution of automobile industry in Nigeria, Review of well equipped automobile workshop, Problems affecting automobile training, Origin of apprenticeship/artisan training, Need for standardizing programme of artisans skill for effective maintenance of automobile, Artisans and modern changes in the automobile industry, Challenges for modern mechanics, Methods of standardizing auto mechanic programme, Organization and management of an automobile workshop department

Desirable equipment.

A questionnaire which contained 30 items was used to get information from two sets of respondents which were car owners and auto-mechanics, which was then analyzed by the use of statistical tools like mean and standard deviation. The questionnaire was validated by the researcher's supervisor and three other lecturers from the department of Industrial and Technology Education.

A descriptive survey approach was used to develop the instrument for the study. Three research questions were formed for the specific purpose for guiding the study. The study identified some modern automobile workshop challenges and some ways of tackling these

challenges were talked about. The study showed that computer knowledge has become very important in the operational work of an automobile workshop.

Strategies have been found to be effective in the training of roadside mechanics and they include the suggestion that modern automobile workshops should form partnerships with the roadside mechanics.

### **Implication of the study**

The findings from this study have shown the various strategies of improving the modern automobile workshops performance by solving some of the challenges which they face, the strategies include; the provision of funds for the development of the workshops, the active services of loan banks for the automobile industry, the building of a rapport between the workshops and the car manufacturers to provide authentic spare part, which helps in making good warranty policies. The findings from this study have revealed that environmental pollution caused by roadside mechanics due to lack of proper disposal practices can be reduced to the nearest minimum level possible. The implication of this study could result in the gradual extinction of roadside auto-technicians which would help in the planning and development of modern cities. And it will be difficult to prevent the unnecessary obstruction of traffic caused by breaking down of vehicles as a result of poor maintenance practices. Some suggested policies were mentioned which assists in the training of roadside mechanics.

### **Conclusions**

From the findings of this study, it is clear that the inadequacy of tools, the challenges of modern automobile and the poorly trained roadside mechanic can be reduced, through the making of policies which would require everybody in the automotive field to seek education as it will be a major requirement for practicing in the industry. It is also clear that the

environmental pollution caused by roadside mechanics is caused as a result of the high illiteracy rate amongst them, and it is abolished through the creation of awareness of the proper methods of disposal and the creation of offices to checkmate defaulters of the laws placed. It is drawn from the findings of this study, that the challenges of modern automobile workshops can be solved in Lagos state.

### **Recommendations**

Based on the findings of the study the following were recommended;

1. Government should make special programmes which collaborates both the roadside mechanic and the modern automobile workshop.
2. The teaching of basic computer operating techniques should be made mandatory in technical colleges
3. Government should provide scholarship programmes into technical colleges
4. Automobile loan banks should be created to provide special loaning services
5. Maintenance facilities for the special tools used in the automobile industries should be provided around the country.
6. Relationships between car manufacturers and the automotive industries in the country should be encouraged.

### **Suggestion for further study**

1. Implication of the appraisal of maintenance culture in the modern automobile workshops.
2. Problems militating against the establishment of standard automobile workshops by indigenous mechanics in Lagos state.

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Technology.

**APPENDIX II**

**QUESTIONNAIRE**

**FEDERAL UNIVERSITY OF TECHNOLOGY MINNA, NIGER STATE**

**SCHOOL OF SCIENCE AND SCIENCE EDUCATION**

**DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY AND TECHNOLOGY EDUCATION**

**THIS RESEARCH WORK IS ON THE CHALLENGES OF MODERN AUTOMOBILE WORKSHOPS AND THE TRAINING STRATEGIES FOR ROADSIDE AUTOMOBILE MECHANICS.**

**SECTION A**

**RESPONDENT: CAR OWNER**

**AUTOMOBILE MECHANIC**

Instruction: please be objective and sincere in answering the questions below. Your answer shall be treated confidentially. Thanks for your anticipated cooperation.

Section B, C, D below are research questions and their items, kindly indicate a tick ( ) against each statement in the appropriate column which describe the extent to which you agree with the statement by using the following key.

Strongly Agree - SA

Agree - A

Disagree - D

Strongly disagree - SD

**SECTION B**

**RESEARCH QUESTION 1:**

What are the challenges of modern automobile workshops?

S/NO	ITEMS	SA	A	D	SD
1	Modern automobile workshops are seen as a place for only the rich.				
2.	Modern automobile workshops do not have good rapport with car manufacturers to request for spare parts.				
3.	The new spare parts produced by contracted manufacturers are not of high quality				
4.	Spare parts don not have good warranty policy				
5.	There is usually delay in supply of spare parts by suppliers				
6	There is no trust in mechanics by the customers which prevents the customer from releasing money to buy parts				
7.	Bridge in communication between part suppliers and mechanics				
8.	Poor workshop organisation prevent the easy flow of operations				
9.	Tools required for operations in new model vehicles are too sophisticated				
10.	Competition due to price difference between roadside mechanic and modern automobile workshops				

## SECTION C

### RESEARCH QUESTION 2:

What are the training strategies for roadside mechanics?

<b>S/NO</b>	<b>ITEMS</b>	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
1.	Technical colleges should restructure and make provision for training and retraining of roadside mechanics				
2.	Policies which require certified personnel to sign off on any repair work carried out on a car before it is fit to be on the road should be created				
3.	Partnership should be created between roadside mechanics and modern automobile workshops				
4.	Enlightenment seminars should be organised for roadside mechanics to foster proper automobile maintenance habit and discourage roadside operations				
5.	Government should make regulations on environmental pollution in order to make roadside mechanic seek knowledge for proper disposal methods.				
6.	Government should provide programmes which collaborate the roadside mechanic with modern workshops to teach them of the new technology employed in new cars.				
7.	Car owners should make sure that mechanics have a degree of technical educational background before releasing their vehicles.				
8.	Government should provide scholarships for admission into technical colleges to enable interested individuals in automobile field have technical education background.				
9.	Introduction of computer classes into technical programmes to stand as a stepping stone for the future encounter with computerised vehicle.				
10.	Recruitment of workers from the roadside mechanics with educational background.				

## **SECTION D**

### **RESEARCH QUESTION 3:**

What are the causes of inadequacy of tools, equipments and automobile workshop management?

<b>S/NO</b>	<b>ITEMS</b>	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
1.	Inadequacy of financial services for the automobile industry in Nigeria				
2.	Some special tools that are available in the local outlets are extremely expensive				
3.	Most of the special tools have to be imported from overseas this causes discouragement to purchase them				
4.	Lack of technical knowhow in the use of special tools results in the damage of tools				
5.	Lack of maintenance facility of special tools in the country which results in sending the equipment overseas for repair				
6.	The government should invest more in the development of automobile workshops				
7.	Poor system of inventory control which gives room for carelessness of technicians.				
8.	Improper planning of the workshop could lead to organisational deficiency.				
9.	Purchasing of cheap tools with the purpose of saving money results in the purchase of low quality tools which do not last long.				
10.	Seminars should be organised to appraise maintenance culture which helps in workshop organisation.				

