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# The Effects of Auto Technicians' Activities on Frequent Breakdowns of Vehicles in Nigeria: A Case Study of Owerri Metropolis-Imo State

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## Abstract

The study identified how the activities of auto technicians affect the frequent breakdowns of vehicles. It adopted a quantitative approach. Primary data were collected by carrying out an assessment by means of observations, questionnaires, and interviews with drivers and auto technicians. A Binary Logistic Regression Model was employed in the data analysis, while a Chi-square test of independence was used for the hypotheses. SPSS software package was used for these analyses. The overall analysis revealed that the activities of auto technicians affect the frequent breakdown of vehicles through the use of fake and refurbished vehicle parts, working without auto shops, tools, and equipment, lack of technical training, poor education background, and lack of knowledge of the use of vehicle digital diagnostic equipment. The situation requires quick intervention to assist the untrained and ill-equipped auto technicians to help improve their services which will improve the social and economic value of the transport system in Nigeria. The paper will be a guide to scholars and researchers who might be dealing with related issues.

## Keywords

Frequent Vehicle Breakdown, Automobile Technicians, Poor Maintenance Services

## 1. Introduction

### 1.1. Background of the Study

A good transportation system is the basis of economic and social development in

every nation including Nigeria, and the commonest means of transport in Nigeria is motor vehicle. Owning a vehicle is a necessity considering its economic and social values, yet some people get scared of owning one due to problems of vehicle breakdown. Vehicles are being used for transportation either for commercial or private purposes, and most times these vehicles are being subjected to breakdown due to one reason or the other. (Hasbollah, 2021) defines vehicle breakdown as when a car suffers a severe electrical or mechanical fault that stops it from working safely, assuming you can get it to move at all. (Cary, 2021) asserted that "At times a breakdown will give you no choice but to leave your car stranded in the middle of the road" Some of the breakdown issues in a vehicle come from the brake, battery, fuel pump, etc. However, it is expected that the auto technicians will handle the maintenance and repair when there is a need for it. Auto technicians can be mechanical technicians, electrical technicians, wheel and alignment technicians, etc. The engagement of auto technicians in vehicle maintenance and repairs is vital and indispensable when there is a need for them, and they are expected to do their job to satisfy their clients and win their trust and confidence for continuous service provider and customer relationships. (Hong et al., 2020) noted that confidence benefits should be consolidated and that professionalism or service quality excellence in maintenance or repair becomes the most important factor in producing customer engagement or long-term relationship continuity in auto maintenance and repair service. That is the reason there is a huge concern among vehicle owners, vehicle fleet managers, delivery companies, etc. to ensure that their auto service providers are doing the right practices of vehicle maintenance and repairs. A good mechanic can fix small problems before they become big problems, they encourage routine check-ups, and the better they are, the less frequently you need them, (Indeed Editorial Team, 2022). Though vehicle breakdown is normal, especially in a country like Nigeria where about 60,000 motor vehicles are imported annually of which more than 85% are used vehicles that were imported from Western countries as reported by (Agbo, 2011), when the breakdown is frequent, it becomes a big concern. Considering these issues surrounding frequent vehicle breakdowns of vehicles, even after maintenance services, this paper intends to evaluate the activities of auto technicians with a view to identifying how they affect the frequent breakdown of vehicles.

### 1.2. Statement of the Problem

Vehicles are necessities of life due to their economic and social values. They however cause nightmares when they frequently breakdown, and this gives room for much concern. Interaction with a table water producer shows that their delivery vans go to auto technicians for maintenance services almost weekly. This affects the company's overall output. It is obvious that society has lost confidence in the performance of many auto technicians due to continuous vehicle breakdowns even after maintenance services. It is overwhelming that after such

maintenance services with the attendant cost implications, the frequency of breakdown remains almost unabated. These concerns triggered the evaluation of the effects of auto technicians' activities on frequent breakdowns of vehicles.

### 1.3. Scope of the Study

This work is to review the activities of auto technicians and how they affect frequent breakdowns of vehicles. The study covers Owerri Metropolis of Imo State, Nigeria. Owerri Metropolis consists of Owerri Municipal, Owerri North, and Owerri West Local Government Areas. The Auto Technicians used in the study are limited to major technicians like mechanical and electrical technicians. Drivers (private and commercial) were involved in the study.

### 1.4. Empirical Review

Scanty-related kind of literature is available on the effect of auto technician activities on the frequent breakdown of vehicles as shown below.

(Agyemang, 2014), studied the "Effects of Poor Engine Repairs and Maintenance by Mechanics Operating in Local Garages" The variables studied are poor engine repairs and maintenance, mechanics, and local garages. The researcher adopted a quantitative research method which involves the use of self-administered structured questionnaires. The response to each of the research questions was analyzed using frequency counts and percentages. Analysis of the results revealed that there is an urgent need for the respondents to undergo retraining in order to raise the level of their technical know-how. Even though some of their practices were right, most of them could lead to frequent breakdowns of the engines. The emphasis was on engine repair, but this paper cares much about the general maintenance of vehicles including engines.

(Akuh & Agyeman, 2019) Published the paper titled "Assessing the Knowledge and Impact of Advanced Automobile Technology on the Repair Business of Informal Automobile Mechanics in Ghana (Ho municipality)" The variables studied are knowledge of informal automobile mechanics (technicians) on advanced automobile technology, diagnostic abilities and the impact advanced automobile technology is having on their repair business. The result shows that the introduction of advanced technology into modern vehicles affects the business of informal automobile repair garages negatively (84.6%) and gradually sends informal automobile mechanics out of business. Though the emphasis was on knowledge of advanced automobile technology, this project cares about the knowledge of auto technicians for both existing technology and advanced ones.

### 1.5. Statement of Hypothesis

1) $H_O$: Auto technicians with poor educational backgrounds do not have challenges in delivering good quality maintenance services.

$H_A$: Auto technicians with poor educational backgrounds do have challenges in delivering good quality maintenance services.

2) $H_O$: Engaging the services of untrained and unskilled auto technicians does not lead to poor vehicle maintenance services.

$H_A$: Engaging the services of untrained and unskilled auto technicians leads to poor vehicle maintenance services.

3) $H_O$: Lack of knowledge of advanced automobile technology like vehicle digital diagnostic equipment does not lead to poor vehicle maintenance services, which contributes to more breakdowns of vehicles.

$H_A$: Lack of knowledge of advanced automobile technology like vehicle digital diagnostic equipment, leads to poor vehicle maintenance services which contributes to more breakdown of vehicles

4) $H_O$: The use of fake and refurbished vehicle parts does not contribute to the frequent breakdown of vehicles

$H_A$: The use of fake and refurbished vehicle parts contributes to the frequent breakdown of vehicles

5) $H_O$: Working without a good auto shop, tools, and equipment does not contribute to the frequent breakdown of vehicles.

$H_A$: Working without a good auto shop, and the right tools and equipment creates problems that lead to frequent breakdowns of vehicles.

## 2. Review of Related Literature

### Conceptual Review

A vehicle breakdown occurs when the vehicle fails to perform its duty due to some problems, and the problems may occur anytime and anywhere. There are so many vehicle breakdown issues such as brake problems, radiator issues, battery problems, suspension issues, etc. It is now clear that vehicle breakdown is not an unusual situation, there will always be a minimum reason why it occurs, but when the vehicle breakdown becomes more frequent than imagined, the instinct to ask why will always be there. The concern most of the time is on the services rendered by vehicles' service providers, considering if they are really doing good quality maintenance services, especially where you notice continuous problems even after maintenance services. A conceptual model is developed to review how the performance of automobile service providers affects the frequent breakdown of vehicles. The model in **Figure 1** below considers the auto technician's performance and its effect on the frequent breakdown of vehicles.

Normally a faulty vehicle is taken to an auto technician for services with the expectation to render good services by rectifying the problem and putting the vehicle back in service, but in a situation where a vehicle is taken to a technician, and after maintenance services, the problem will either still be there or it has increased to another level. The vehicle owner will have no choice, but to take the vehicle back to the technician, or better, to another auto technician for trial. Hence, when your vehicle continues to show a sign of breakdown even after maintenance, it is a big concern that needs urgent attention, and that required attention is the aim and objective of this paper.

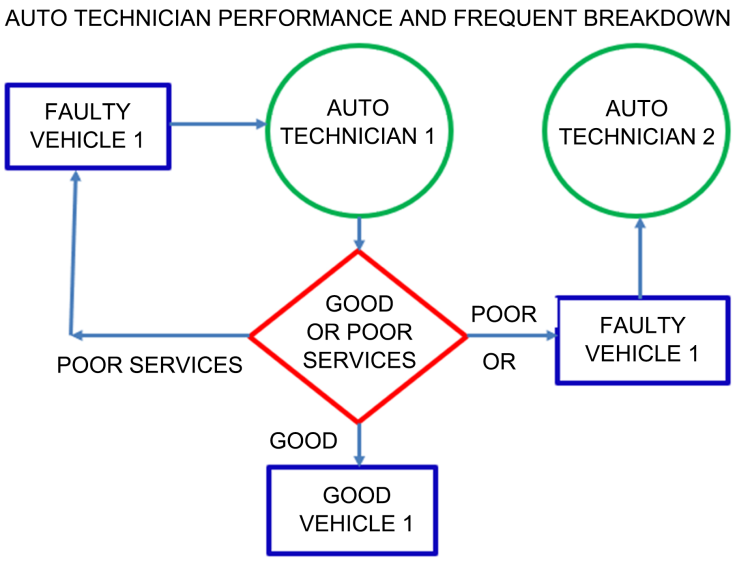


**Figure 1.** Auto technicians' performance and frequent breakdown of vehicles.

## 3. Methodology

### 3.1. Research Design

In this paper, the research adopted a quantitative approach and descriptive design method which involves the use of self-administered structured questionnaires and personal interviews. The study has frequent breakdowns of vehicles as the dependent variable, and inexperienced and ill-equipped auto technicians, fake and refurbished spare parts, and lack of equipped Auto Shop, lack of advanced automobile technology knowledge, poor education background as independent variables. The questionnaires were categorized into two, one for the auto technicians and the other for drivers. The population under study was about 5115 drivers with a sample size of 263. The 263 questionnaires were distributed across Owerri metropolis, and 144 were filled and returned. For the auto technicians, the population size is 920 with a sample size of 213. 213 questionnaires were distributed across Owerri Metropolis, and 131 were filled and returned. (Yamane 1967) model was used in the calculation of the sample sizes, and a probabilistic (Purposive Sampling) technique was used in the sample distribution. The binary Logistic Regression Model was used in the analysis of the driver's data, and the Chi-Square test of independence was used to test the null hypothesis to know if there are associations between the dependent and independent variables. Frequency and percentage were used to evaluate technicians' data. The reliability of the instruments was determined, using the Cronbach Alpha Test, while the validity was analyzed using a Bivariate Correlation Table.

### 3.2. Determination of Sample Size

The sample size was obtained using (Yamane 1967) formula given in Equation (3.1).

$$n = \frac{N}{1 + N(e)^2} \tag{3.1}$$

where $n$ is the required Sample –263 and 213 for Drivers and technicians respectively.

$N$ is the population size (5115 & 920), and e is the margin of error allowed (0.06).

## 4. Data Collection and Analysis

### 4.1. Data Collection (Coded)

See Table 1.

Table 1. Coded data.

| DV1 | DV2 | DV3 | DV4 | DV5 | DV6 |
|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 1 | 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 1 | 0 | 1 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 0 | 1 | 1 | 0 | 1 | 1 |
| 0 | 1 | 1 | 1 | 1 | 1 |

Continued

| | | | | | |
|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 1 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 0 | 0 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 0 |

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|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 1 | 0 | 1 | 1 |
| 0 | 0 | 0 | 1 | 0 | 0 |
| 1 | 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 1 | 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 1 | 1 | 0 | 0 | 1 |
| 0 | 0 | 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 0 | 1 |

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| | | | | | |
|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 1 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |

Continued

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 0 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 0 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 0 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 1 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 1 |
| 0 | 1 | 1 | 0 | 0 | 1 |
| 0 | 1 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 1 | 0 | 1 | 1 |

where 1 = Yes, and 0 = No.

## 4.2. Data Analysis

### 4.2.1. Reliability and Validity of Instruments

**Reliability Test**

Table 2 below shows that the reliability test conducted on drivers' data using the Cronbach Alpha Test model has a coefficient value of 0.858. The coefficient value of 0.700 to 1 is regarded as a good value for analysis, but a value of 0.8 and above implies that the data is very good and reliable enough to carry out the required analysis. In this case, we have a value of 0.858 which is very reliable and acceptable for the required analysis.

Table 2. Reliability statistics value based on Cronbach's alpha test (driver data).

| Reliability Statistics | | |
|---|---|---|
| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
| 0.858 | 0.857 | 6 |

Table 3 shows that the reliability test conducted on auto technicians' data using the Cronbach Alpha Test model, has a coefficient value of 0.844, indicating the data is reliable to carry out the required analysis

Table 3. Reliability value for auto technician data.

| Reliability Statistics | | |
|---|---|---|
| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
| 0.844 | 0.846 | 6 |

### Validity Test

From Table 4, item 1 Sig. (2-tail) showed that the value is statistically significant at a 1% level of significance with a significant value of 0.000. Since the value 0.000 < 0.01, it is concluded that item 1 is valid. The same thing is applicable to other items in Table 4 below. Where DV1 to DV6 represents the independent variables.

Table 4. Validity table for driver data.

| Correlations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | DV1 | DV2 | DV3 | DV4 | DV5 | DV6 | Total |
| DV1 | Pearson Correlation | 1 | 0.692** | 0.727** | 0.747** | 0.753** | 0.195* | 0.900** |
| | Sig. (2-tailed) | | 0.000 | 0.000 | 0.000 | 0.000 | 0.019 | 0.000 |
| | N | 144 | 144 | 144 | 144 | 144 | 144 | 144 |
| DV2 | Pearson Correlation | 0.692** | 1 | 0.654** | 0.625** | 0.608** | 0.175* | 0.816** |
| | Sig. (2-tailed) | 0.000 | | 0.000 | 0.000 | 0.000 | 0.036 | 0.000 |
| | N | 144 | 144 | 144 | 144 | 144 | 144 | 144 |
| DV3 | Pearson Correlation | 0.727** | 0.654** | 1 | 0.695** | 0.679** | 0.123 | 0.843** |
| | Sig. (2-tailed) | 0.000 | 0.000 | | 0.000 | 0.000 | 0.141 | 0.000 |
| | N | 144 | 144 | 144 | 144 | 144 | 144 | 144 |
| DV4 | Pearson Correlation | 0.747** | 0.625** | 0.695** | 1 | 0.699** | 0.016 | 0.827** |
| | Sig. (2-tailed) | 0.000 | 0.000 | 0.000 | | 0.000 | 0.852 | 0.000 |
| | N | 144 | 144 | 144 | 144 | 144 | 144 | 144 |
| DV5 | Pearson Correlation | 0.753** | 0.608** | 0.679** | 0.699** | 1 | 0.116 | 0.845** |
| | Sig. (2-tailed) | 0.000 | 0.000 | 0.000 | 0.000 | | 0.166 | 0.000 |
| | N | 144 | 144 | 144 | 144 | 144 | 144 | 144 |
| DV6 | Pearson Correlation | 0.195* | 0.175* | 0.123 | 0.016 | 0.116 | 1 | 0.353** |
| | Sig. (2-tailed) | 0.019 | 0.036 | 0.141 | 0.852 | 0.166 | | 0.000 |
| | N | 144 | 144 | 144 | 144 | 144 | 144 | 144 |
| Total | Pearson Correlation | 0.900** | 0.816** | 0.843** | 0.827** | 0.845** | 0.353** | 1 |
| | Sig. (2-tailed) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | |
| | N | 144 | 144 | 144 | 144 | 144 | 144 | 144 |

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

From Table 5, item 1 Sig. (2-tail) showed that the value is statistically significant at a 1% level of significance with a significant value of 0.000. Since the value 0.000 < 0.01, it is concluded that item 1 is valid. The same thing is applicable to other items in Table 5 below. Where AT1 to AT6 represents the independent variables.

Table 5. Validity table for auto technicians data.

| Correlation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | AT1 | AT2 | AT3 | AT4 | AT5. | AT6 | Total |
| AT1 | Pearson Correlation | 1 | 0.330** | 0.311** | 0.823** | 0.003 | 0.289** | 0.614** |
| | Sig. (2-tailed) | | 0.000 | 0.000 | 0.000 | 0.970 | 0.001 | 0.000 |
| | N | 131 | 131 | 131 | 131 | 131 | 131 | 131 |
| AT2 | Pearson Correlation | 0.330** | 1 | 0.940** | 0.296** | 0.679** | 0.873** | 0.911** |
| | Sig. (2-tailed) | 0.000 | | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |
| | N | 131 | 131 | 131 | 131 | 131 | 131 | 131 |
| AT3 | Pearson Correlation | 0.311** | 0.940** | 1 | 0.279** | 0.666** | 0.818** | 0.888** |
| | Sig. (2-tailed) | 0.000 | 0.000 | | 0.001 | 0.000 | 0.000 | 0.000 |
| | N | 131 | 131 | 131 | 131 | 131 | 131 | 131 |
| AT4 | Pearson Correlation | 0.823** | 0.296** | 0.279** | 1 | −0.025 | 0.255** | 0.586** |
| | Sig. (2-tailed) | 0.000 | 0.001 | 0.001 | | 0.774 | 0.003 | 0.000 |
| | N | 131 | 131 | 131 | 131 | 131 | 131 | 131 |
| AT5 | Pearson Correlation | 0.003 | 0.679** | 0.666** | −0.025 | 1 | 0.638** | 0.656** |
| | Sig. (2-tailed) | 0.970 | 0.000 | 0.000 | 0.774 | | 0.000 | 0.000 |
| | N | 131 | 131 | 131 | 131 | 131 | 131 | 131 |
| AT6 | Pearson Correlation | 0.289** | 0.873** | 0.818** | 0.255** | 0.638** | 1 | 0.856** |
| | Sig. (2-tailed) | 0.001 | 0.000 | 0.000 | 0.003 | 0.000 | | 0.000 |
| | N | 131 | 131 | 131 | 131 | 131 | 131 | 131 |
| Total | Pearson Correlation | 0.614** | 0.911** | 0.888** | 0.586** | 0.656** | 0.856** | 1 |
| | Sig. (2-tailed) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | |
| | N | 131 | 131 | 131 | 131 | 131 | 131 | 131 |

**. Correlation is significant at the 0.01 level (2-tailed).

#### 4.2.2. Test of Hypotheses—Chi-Square Test of Independence

**Hypothesis Testing 1: Null hypothesis—Auto technicians with poor educational background does not have challenges in delivering good quality maintenance services.**

From the Fisher's Exact Test value in Table 6 below, the exact Sig. (2-sided) column has a *p*-value of 0.000 which is statistically significant because it is less than the alpha value of 0.05, implying that the null hypothesis is rejected, and the alternate accepted, showing it has an association with frequent breakdown of vehicles.

Table 6. Hypothesis testing 1.

| Chi-Square Tests 1 | | | | | |
|---|---|---|---|---|---|
| | Value | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square | 68.871[a] | 1 | 0.000 | | |
| Continuity Correction[b] | 65.393 | 1 | 0.000 | | |
| Likelihood Ratio | 67.210 | 1 | 0.000 | | |
| Fisher's Exact Test | | | | 0.000 | 0.000 |
| Linear-by-Linear Association | 68.392 | 1 | 0.000 | | |
| N of Valid Cases | 144 | | | | |

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 10.45. b. Computed only for a 2 × 2 table.

**Hypothesis Testing 2: Null hypothesis—Engaging the services of untrained and unskilled auto technicians results in poor vehicle maintenance services.**

From the Fisher's Exact Test value in Table 7 below, the exact Sig. (2-sided) column has a *p*-value of 0.000 which is statistically significant because it is less than the alpha value of 0.05, implying that the null hypothesis is rejected, and the alternate which says "Engaging the services of untrained and unskilled auto technicians result to poor vehicle maintenance services that lead to more vehicles breakdown accepted, which implies that it has an association with frequent breakdown of vehicles".

Table 7. Hypothesis testing 2.

| Chi-Square Tests 2 | | | | | |
|---|---|---|---|---|---|
| | Value | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square | 76.178[a] | 1 | 0.000 | | |

**Continued**

| | | | | | |
|---|---|---|---|---|---|
| Continuity Correction[b] | 72.444 | 1 | 0.000 | | |
| Likelihood Ratio | 75.309 | 1 | 0.000 | | |
| Fisher's Exact Test | | | | 0.000 | 0.000 |
| Linear-by-Linear Association | 75.649 | 1 | 0.000 | | |
| N of Valid Cases | 144 | | | | |

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 9.85. b. Computed only for a 2 × 2 table.

**Hypothesis Testing 3: Null hypothesis**—Lack of knowledge of advanced automobile technology like vehicle digital diagnostic equipment does not lead to poor vehicle maintenance services, which contributes to more breakdowns of vehicles.

From the Fisher's Exact Test value in Table 8 below, the exact Sig. (2-sided) column has a *p*-value of 0.000 which is statistically significant because it is less than the alpha value of 0.05, implying that the null hypothesis is rejected, and the alternate accepted, showing that it has an association with frequent breakdown of vehicles.

Table 8. Hypothesis Testing 3.

| Chi-Square Tests 3 | | | | | |
|---|---|---|---|---|---|
| | Value | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square | 80.397[a] | 1 | 0.000 | | |
| Continuity Correction[b] | 76.793 | 1 | 0.000 | | |
| Likelihood Ratio | 80.525 | 1 | 0.000 | | |
| Fisher's Exact Test | | | | 0.000 | 0.000 |
| Linear-by-Linear Association | 79.839 | 1 | 0.000 | | |
| N of Valid Cases | 144 | | | | |

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 11.94. b. Computed only for a 2 × 2 table.

**Hypothesis Testing 4: Null hypothesis—The use of fake and refurbished vehicle parts does not contribute to the frequent breakdown of vehicles**

From the Fisher's Exact Test value in Table 9 below, the exact Sig. (2-sided) column has a *p*-value of 0.000 which is statistically significant because it is less than the alpha value of 0.05, implying that the null hypothesis is rejected, and the alternate" accepted, showing that it has an association with frequent breakdown of vehicles.

Table 9. Hypothesis testing 4.

| Chi-Square Tests 4 | | | | | |
|---|---|---|---|---|---|
| | Value | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square | 81.666[a] | 1 | 0.000 | | |
| Continuity Correction[b] | 78.133 | 1 | 0.000 | | |
| Likelihood Ratio | 83.137 | 1 | 0.000 | | |
| Fisher's Exact Test | | | | 0.000 | 0.000 |
| Linear-by-Linear Association | 81.099 | 1 | 0.000 | | |
| N of Valid Cases | 144 | | | | |

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 13.14. b. Computed only for a 2 × 2 table.

**Hypothesis Testing 5: Null hypothesis—Working without a good auto shop, and the right tools and equipment does not create problems that lead to frequent breakdown of vehicles**

From the Fisher's Exact Test value in Table 10 of Test 5 below, the exact Sig. (2-sided) column has a *p*-value of 0.024 which is statistically significant because it is less than the alpha value of 0.05, implying that the null hypothesis is rejected, and the alternate accepted, showing that it has an association with frequent breakdown of vehicles. (Table 11 and Table 12)

Table 10. Hypothesis testing 5.

| Chi-Square Tests 5 | | | | | |
|---|---|---|---|---|---|
| | Value | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square | 5.454[a] | 1 | 0.020 | | |
| Continuity Correction[b] | 4.532 | 1 | 0.033 | | |
| Likelihood Ratio | 5.228 | 1 | 0.022 | | |
| Fisher's Exact Test | | | | 0.024 | 0.018 |
| Linear-by-Linear Association | 5.416 | 1 | 0.020 | | |
| N of Valid Cases | 144 | | | | |

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 11.35. b. Computed only for a 2 × 2 table.

**Table 11.** Regression analysis-respondents, frequency, and percentage (Drivers).

| Frequency of Response and Percentage | | | | |
|---|---|---|---|---|
| | | Respondents | Frequency | Percentage |
| DV6- Working without a good auto shop, and the right tools and equipment creates problems that lead to frequent breakdowns of vehicles | False | 144 | 38 | 26% |
| | True | 144 | 106 | 74% |
| DV3- Engaging the services of untrained and unskilled auto technicians result in poor maintenance services. | False | 144 | 33 | 23% |
| | True | 144 | 111 | 77% |
| DV4- Lack of knowledge of advanced automobile technology like vehicle digital diagnostic equipment, leads to poor vehicle maintenance services. | False | 144 | 40 | 28% |
| | True | 144 | 104 | 72% |
| DV5- The use of fake and refurbished vehicle spare parts contributes to the frequent breakdown of vehicles | False | 144 | 44 | 31% |
| | True | 144 | 100 | 69% |
| DV2--Auto technicians with poor educational backgrounds do have challenges in delivering good quality maintenance services | False | 144 | 35 | 24% |
| | True | 144 | 109 | 76% |

**Table 12.** Regression analysis-respondents, frequency and percentage (Technicians).

| Frequency of Response and Percentage | | | | |
|---|---|---|---|---|
| | | Respondents | Frequency | Percentage |
| AT6-Are you Familiar with the use of vehicle diagnostic equipment? | No | 131 | 100 | 76% |
| | Yes | 131 | 31 | 24% |
| What type of training did you attend to equip yourself for vehicle maintenance and repair job | On-The-Job Training | 131 | 97 | 74% |
| | Vocational Training | 131 | 34 | 26% |
| AT4 -Do you use fake and refurbished vehicle parts | No | 131 | 35 | 27% |
| | Yes | 131 | 96 | 73% |
| AT5-Do you have a good auto shop with equipment and tools for vehicle maintenance services? | No | 131 | 96 | 73% |
| | Yes | 131 | 35 | 27% |
| What is your level of education? | Primary and Secondary | 131 | 100 | 76% |
| | Polytechnic and University | 131 | 31 | 24% |

#### 4.2.3. Binary Logistics Regression Analysis

Table 13 below shows the overall Classification Accuracy in Percentage of the Logistic Regression Model Block 0 before any independent variable is added to the model as 70.1%.

Table 13. Regression analysis-classification table for block 0 (drivers).

| Classification Table for Block 0 | | | | |
|---|---|---|---|---|
| Observed | | Predicted | | |
| | | DV1- Have you experienced frequent vehicle breakdowns? | | Percentage Correct |
| | | No | Yes | |
| DV1- Have you experienced frequent vehicle breakdowns? | No | 0 | 43 | 0.0 |
| | Yes | 0 | 101 | 100.0 |
| Overall Percentage | | | | 70.1 |

Table 14 below shows, the Classification Table which assessed the effectiveness of the predicted classification against the actual classification. 96.0% of participants who experienced frequent breakdowns were correctly predicted by the model to experience frequent breakdowns while 86.0% of the participants who did not experience frequent breakdowns were also correctly predicted.

Table 14. Regression analysis-classification table for block 1 (drivers).

| Classification Table for Block 1 | | | | |
|---|---|---|---|---|
| Observed | | Predicted | | |
| | | DV1- Have you experienced frequent vehicle breakdowns? | | Percentage Correct |
| | | No | Yes | |
| DV1- Have you experienced frequent vehicle breakdowns? | No | 37 | 6 | 86.0 |
| | Yes | 4 | 97 | 96.0 |
| Overall Percentage | | | | 93.1 |

When the independent variables were added to Logistic Regression Model Block 1, the overall Classification Accuracy in Percentage increased from 70.1 to 93.1%.

In Table 15 which shows the Model Summary, the variation in the dependent variable based on our model ranges from 57.2% to 81.1%, depending on whether you reference the Cox & Snell R2 or Nagelkerke R2 models respectively, but in this study, Nagelkerke R2 was used which has a value of 81.1% variation in the dependent variable (Frequent Vehicle Breakdown) because of addition of independent variables.

Table 15. Regression analysis-model summary (drivers).

| Model Summary | | | |
|---|---|---|---|
| Step | −2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
| 1 | 53.510[a] | 0.572 | 0.811 |

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than 0.001.

Table 16 shows the Hosmer-Lemeshow test which is very important in evaluating the fitness of the model. A nonsignificant chi-square indicates that the model fits the data very well. From Table 15, the $p$-value is 0.723 which is not statistically significant, because it is greater than the 5% level of significance (0.05), and this implies that the model fits the data very well.

Table 16. Hosmer and Lemeshow test (drivers).

| Hosmer and Lemeshow Test | | | |
|---|---|---|---|
| Step | Chi-square | df | Sig. |
| 1 | 2.070 | 4 | 0.723 |

After the addition of independent variables to the logistics regression model block 1, values that are statistically significant emerge in the "Sig." Column of Table 17 below which shows that for DV2, $p = 0.021$; For DV3, $p = 0.040$; For DV4, $p = 0.003$; For DV5, $p = 0.005$, and for DV6 = 0.042. These values added significantly to the model, and that has a positive effect on the likelihood of frequent vehicle breakdowns.

Table 17. Regression Analysis-$p$-Values for Drivers (Only Significant values were shown).

| Variables in the Equation | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | B | S. E. | Wald | df | Sig. | Exp (B) | 95% C. I. for EXP (B) | |
| | | | | | | | | Lower | Upper |
| Step 1[a] | DV2 | 1.940 | 0.839 | 5.340 | 1 | 0.021 | 6.956 | 1.342 | 36.046 |
| | DV3 | 1.999 | 0.976 | 4.197 | 1 | 0.040 | 7.382 | 1.090 | 49.979 |
| | DV4 | 2.701 | 0.895 | 9.110 | 1 | 0.003 | 14.899 | 2.579 | 86.091 |
| | DV5 | 2.145 | 0.772 | 7.720 | 1 | 0.005 | 8.539 | 1.881 | 38.762 |
| | DV6 | 1.863 | 0.916 | 4.142 | 1 | 0.042 | 6.446 | 1.071 | 38.785 |
| | Constant | −6.372 | 1.551 | 16.874 | 1 | 0.000 | 0.002 | | |

Variable(s) entered on step 1: DV2-Auto technicians with poor educational background do have challenges in delivering good quality maintenance services, DV3-Engaging the services of untrained and unskilled auto technicians results in poor maintenance services., DV4-Lack of knowledge of advanced automobile technology like vehicle digital diagnostic equipment, leads to poor vehicle maintenance services., DV5-The use of fake and refurbished vehicle spare parts contributes to the frequent breakdown of vehicles, DV6-Working without a good auto shop, and the right tools and equipment creates problems that lead to frequent breakdown of vehicles.

The information in Table 17 is also used to predict the probability of an event occurring based on a one-unit change in an independent variable when all other independent variables are kept constant. For DV2, with an odds ratio of 6.956, a unit increase in DV2, increases the odds of frequent vehicle breakdown by 596%. For DV3, with an odds ratio of 7.382, a unit increase in DV3, increases the odds of frequent vehicle breakdown by 638%. For DV4, with an odds ratio of 14.899, a unit increase in DV4, increases the odds of frequent vehicle breakdown by 1390%. For DV5, with an odds ratio of 8.539, a unit increase in DV5, increases the odds of frequent vehicle breakdown by 754%. For DV6, with the odd ratio of 6.446, a unit increase in DV6, increases the odds of frequent vehicle breakdown by 545%.

Meanwhile, DV2 to DV6 represent the independent variables as shown in Table 17 above.

#### 4.2.4. Discussion of Findings

**Results of the Reliability Test**

The Alpha Cronbach's test statistic is used to check the reliability of the data. The coefficient of reliability range is between 0 and 1, with higher values indicating that the data is more reliable. Table 2 and Table 3 show that the reliability values of the drivers and technician data are 0.858 and 0.844 respectively, which implies the instruments are very reliable and good for the required analysis.

**Results of the Validity Test**

One of the ways of evaluating the validity of an instrument is using the Pearson correlation table as shown in Table 4 and Table 5. With a 1% level of significance (0.01), and sig. (2 tail), the *p*-values are shown to be 0.000 for all the items, and $0.000 < 0.01$ which implies that the instruments are valid and good for the required analysis.

**Hypotheses Testing Results**

The Chi-Square Test of Association was carried out on the five hypotheses to know if the independent variables have a significant association with the dependent variable using a significant level of 5% with an alpha value of 0.05, and the following results appeared:

**Hypothesis Test 1**—The result shows that the *p*-value is statistically significant with a value of 0.000 as shown in Table 6, implying that the null hypothesis is rejected and the alternate which says, "Auto technicians with poor educational background have challenges in delivering good quality maintenance services" is accepted. This means that "Auto technicians with poor educational background have challenges in delivering good quality maintenance service" have an association with frequent vehicle breakdowns. Hence, poor maintenance services due to poor education background create more problems that cause frequent breakdowns of vehicles.

**Hypothesis Test 2**—The result shows that the *p*-value is statistically significant with a value of 0.000 as shown in Table 7, implying that the null hypothesis is rejected and the alternate which says "Engaging the services of untrained and

unskilled auto technicians leads to poor vehicle maintenance services which result in more vehicle breakdown" accepted. This means that the independent variable has an association with the dependent variable (frequent vehicle breakdown), implying that engaging auto technicians who are not well-trained and skilled enough to handle vehicle repairs is a recipe for more vehicle breakdowns.

**Hypothesis Test 3**—The result shows that the *p*-value is statistically significant with a value of 0.000 as shown in Table 8, implying that the null hypothesis is rejected and the alternate which says "Lack of knowledge of advanced automobile technology like vehicle diagnostic equipment leads to poor vehicle maintenance services that contributes to frequent breakdown of vehicles" accepted. This means that the independent variable has an association with the dependent variable (frequent vehicle breakdown). Obviously, there is no way auto technicians can do a good job without a thorough diagnosis of the problem using diagnostic equipment, but because they do not have the knowledge, they do trial by error, thereby creating more problems on the vehicles that lead to frequent breakdowns.

**Hypothesis Test 4**—The result shows that the *p*-value is statistically significant with a value of 0.000 as shown in Table 9, implying that the null hypothesis is rejected and the alternate which says, "The use of fake and refurbished vehicle parts contributes to frequent breakdown of vehicles" accepted. This means that the independent variable has an association with the dependent variable (frequent vehicle breakdown). The association implies that using fake and refurbishing vehicle parts creates more problems for the vehicles that result in more breakdowns.

**Hypothesis Test 5**—The result shows that the *p*-value is statistically significant with a value of 0.024 as shown in Table 10, implying that the null hypothesis is rejected and the alternate which says, "Working without good auto shop, and the right tools and equipment create problems that lead to frequent breakdown of vehicles" Accepted. This means that the independent variable has an association with the dependent variable (frequent vehicle breakdown). The association of the two variables implies that working without the right tools and equipment leads to poor maintenance services. Working without good auto shops leads to poor quality maintenance services and create more problems for the vehicles that lead to frequent breakdown.

### 4.3. Logistics Regression Analysis

The binary logistic variable(s) in block zero (the null model) showed a regression model Test conducted with the frequent vehicle breakdown as the dependent variable without any independent variable. The overall classification ability of the logistic regression model before the addition of the independent variable is 70.1%, as shown in Table 13. As the independent variables were added to the Block 1 model, overall classification accuracy in percentage, increased from 70.1% in the Block Zero model to 93.1% in the Block 1 model as shown in the classification Table 14. This is an indication that the model predicts correctly.

Nagelkerke's $R^2$ = 0.825, indicating 82.5% of the variation in frequent vehicle breakdown is attributed to the model. It demonstrates the strength of the model.

With a 5% level of significance (0.05), the statistical significance of the test is found in the "Sig." Column of Table 17 which shows that for DV2, $p$ = 0.021; For DV3, $p$ = 0.040; For DV4, $p$ = 0.003; For DV5, $p$ = 0.005, and for DV6 = 0.042. These values added significantly to the model, and that has a positive effect on the likelihood of frequent vehicle breakdowns.

The information in Table 17 is also used to predict the probability of an event occurring based on a one-unit change in an independent variable when all other independent variables are kept constant. For DV2, with an odds ratio of 6.956, a unit increase in DV2, increases the odds of frequent vehicle breakdown by 596%. For DV3, with an odds ratio of 7.382, a unit increase in DV3, increases the odds of frequent vehicle breakdown by 638%. For DV4, with an odds ratio of 14.899, a unit increase in DV4, increases the odds of frequent vehicle breakdown by 1390%. For DV5, with an odds ratio of 8.539, a unit increase in DV5 increases the odds of frequent vehicle breakdown by 754%. For DV6, with odd ration of 6.446, a unit increase in DV6, increases the odds of frequent vehicle breakdown by 545%.

Meanwhile, DV2 to DV6 represent the independent variables as shown in Table 17.

The overall analysis identified that the auto technician's poor maintenance performance contributes to the frequent breakdown of vehicles due to the following defects of auto technicians:

1) No technical skills and formal training in vehicle maintenance services.

2) The use of fake and refurbished vehicle parts in maintenance services.

3) Auto technicians with poor educational background

4) Lack of knowledge of advanced automobile technology like vehicle diagnostic equipment.

5) Working without good auto shops with tools and equipment

All these defects culminated in poor performance of the auto technician which contributes to frequent breakdown of vehicles. These factors are discussed in detail below using graphical data.

**1) The defects of Auto Technicians and knowledge of diagnostic Equipment**

Figure 2 below highlights those with poor educational backgrounds (ended up in primary and secondary school), auto technicians who have no technical training, and those who have no good auto shops, tools, and equipment, comparing how familiar they are with digital diagnostic equipment. The figure shows that 97% (86 + 8 + 1 + 2) of those who are not familiar with the use of vehicle digital diagnostic equipment are those who ended their educational career with primary and secondary school. It is an indication that poor educational background contributes to poor performance of maintenance services which contributes to frequent breakdown of vehicles. On the contrary, 90.3% (74.2 + 16.1) of those who are familiar with the use of vehicle digital diagnostic equipment are people who have gone through polytechnics and universities.

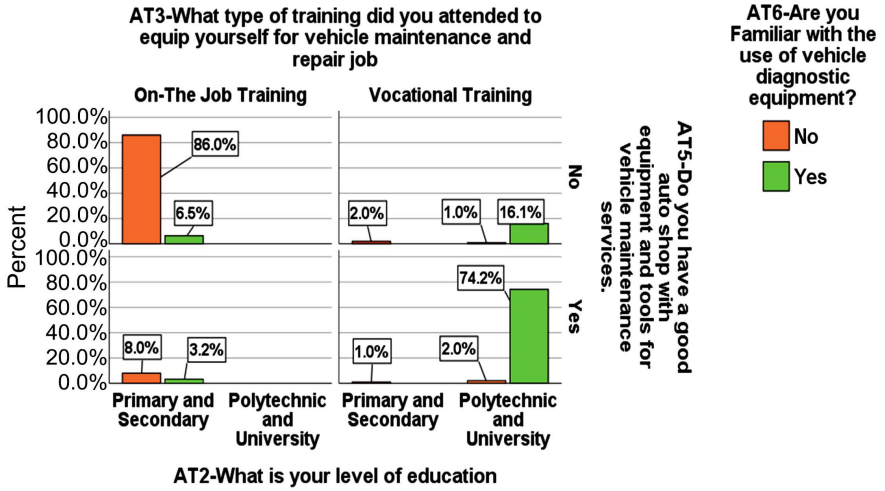


Figure 2. Shows how the defects of auto technicians affect their knowledge of vehicle digital diagnostic equipment.

94% (86 + 8) of those who are not familiar with the use of vehicle digital diagnostic equipment are those who are not technically trained to do vehicle maintenance services, rather they are recruited and trained on the job, which is a recipe for poor quality vehicle maintenance services which will cause more vehicles breakdown. On the contrary, 93.3% (74.2 + 16 + 1 + 2) of those who are familiar with the use of vehicle digital diagnostic equipment are people who had technical training through vocational schools. For auto shops and tools, 89% (86 + 2 + 1) of those who are not familiar with the use of vehicle digital diagnostic equipment are those who do not have good auto shops, no good tools, and equipment to do a good job, rather they stay in open places and use anything available as tools. All these defects are the major causes of poor vehicle maintenance services which results in frequent breakdown of vehicles.

**2) The defects of Auto Technicians and frequent breakdown of vehicles**

Figure 3 below highlights engaging the services of untrained and unskilled auto technicians, the use of fake and refurbished vehicle parts, and auto technicians who do not have good auto shops with tools and equipment. 97% (68.3 + 20.8 + 7.9) of those who have experienced frequent breakdowns of vehicles are those who have engaged the services of untrained and unskilled auto technicians. Approximately, 92% (68.3 + 20.8 + 3) of those who have experienced frequent breakdowns of vehicles, are those who have experienced the use of fake and refurbished vehicle parts for maintenance services. Approximately 79% (68.3 + 7.9 + 3) of those who have experienced frequent breakdowns of vehicles are those who have engaged auto technicians without good auto shops, tools, and equipment. What do you expect from the auto technician who has no auto shop, tools, and equipment to work, rather than creating more problems for the vehicle? Below is Figure 4 showing auto technicians working in open space come rain or shine. They do not have good auto shops, no tools and equipment. They end up creating problems that will cause the breakdown of vehicles.

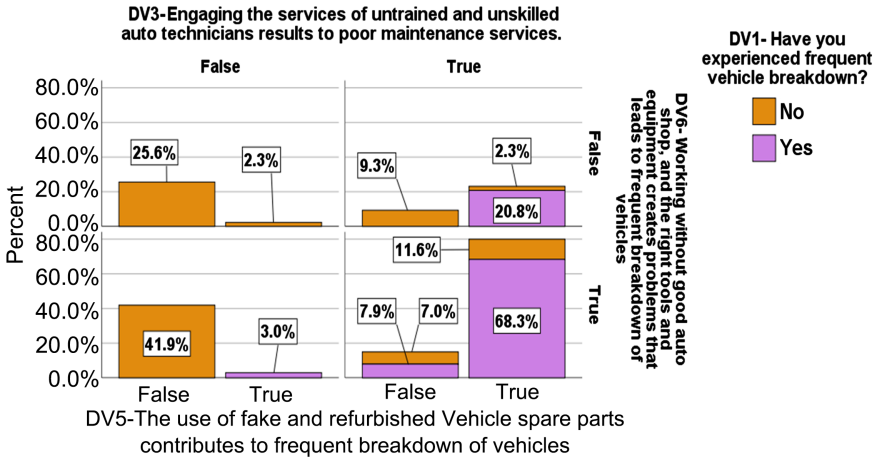


Figure 3. Show the defects of auto technicians affect frequent breakdown of vehicles.

Figure 4. Shows auto technicians working in open spaces, with no good auto shop, and no good tools and equipment.

## 5. Summary of Findings, Conclusion, and Recommendations

### 5.1. Summary of Findings

1) The reliability analysis using the Cronbach Alpha Test model yielded satisfactory results, with an Alpha value of 0.858 and 0.844 for data collected from drivers and auto technicians respectively.

The validity analysis which used Pearson Correlation Table 4 and Table 5 yielded good results with the items' $p$-values statistically significant at 1% level significance, all the $p$-values are 0.000, and $0.000 < 0.01$, hence the instrument is valid.

2) The Chi-square test model for hypothesis testing also yielded significant results at a 5% significance level (0.05), with $p$-values of 0.000, 0.000, 0.000, 0.000, and 0.024 for tests 1 - 5, respectively.

3) The Binary Logistic Regression model showed an increase in classification accuracy in percentage from 71.2% to 93.1% after the addition of independent variables. Nagelkerke's $R^2 = 0.811$, indicating 81.1% of the variation in frequent vehicle breakdown which is attributed to the model.

The independent variables added to model 1 were statistically significant at a 5% level of significance (0.05) with value for DV2, $p = 0.021$; For DV3, $p = 0.040$; For DV4, $p = 0.003$; For DV5, $p = 0.005$, and for DV6 = 0.042. These values added significantly to the model, and that has a positive effect on the likelihood of frequent vehicle breakdowns.

The probability of an event occurring based on a one-unit change in an independent variable when all other independent variables are kept constant shows that there is an increase in the odds of frequent breakdown by 596%, 638%, 1390%, 754%, and 545% for DV2, DV3, DV4, DV5, and DV6 respectively, representing the independent variables.

4) The overall analysis identified that the auto technician's poor maintenance services contribute to the frequent breakdown of vehicles due to the poor education level of the auto technician, working without good auto shops, tools, and equipment, lack of technical training, the use of fake and refurbished vehicles parts, and lack of knowledge of the use of vehicle digital diagnostic equipment.

### 5.2. Conclusion

Based on the investigation of the five anchored research questions, the study confirmed the reliability of the data collected using appropriate statistical methods. It was established that the independent variables have an association with the dependent variable, and the analysis revealed that auto technicians affect frequent vehicle breakdowns through the use of fake and refurbished vehicle parts, working without auto shops, tools, and equipment, lack of technical training, poor education background, and lack of knowledge of the use of vehicle digital diagnostic equipment. With all these vital defects on the side of auto technicians it will be almost impossible to render good quality maintenance services on vehicles, instead, their services will create more problems that will lead to frequent breakdowns of vehicles. The situation requires a quick intervention, and if nothing is done to remedy the situation, the issue of frequent breakdown of vehicles, even after maintenance services will be endless.

### 5.3. Recommendations

To address the issue of frequent breakdown of vehicles through poor vehicle maintenance services by auto technicians, especially the issues of carrying out vehicle maintenance services without good auto shops, tools, and equipment, and lack of technical training, the government should come up with a clear pol-

icy that is realistic and achievable to help auto technicians. The policy should center on the provisions of vocational centers for training of auto technicians, and to provide financial assistants in the form of grants or soft loans to enable trained technicians to establish good auto shops with tools and equipment, and that will enable them to face the challenges of advance technological development in the automobile industry.

### 5.4. Contribution to Knowledge

This paper will be a guide to vehicle owners, vehicle fleet managers, and other drivers who might wish to carry out vehicle maintenance services to realize that the choice of auto technician you make, determines the state of your vehicle. Researchers and scholars dealing with a related issue will also find this paper very useful.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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