

Technology and Modern Automobile Industry- Challenges and Opportunities for Roadside Mechanics in Ghana. (Tarkwa Nsueam Municipality).

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Abstract

Over the years there has been enormous technological improvement to the modern day vehicle design for it to be safer, efficient and pleasing to the customer. The most recent achievement in the modern vehicle with regards to repair is the On-Board Diagnostic (OBD). This improvement has made the modern vehicles more efficient with regards to performance and has also made repairs of vehicles simple and less stressful. However, this technological advancement in vehicle design and repairs pose great challenge to most roadside mechanics in Ghana. This research identified changes in modern vehicle technologies, their challenges associated with repairs and possible opportunities available to roadside mechanics in Ghana. Survey research method was used as a data collection tool. Fifty questionnaires were administered to roadside garage owners in the Tarkwa Nsueam township. This paper concludes that, the major challenges facing roadside mechanics in Ghana in the advent of vehicle technology is the lack of skills on the use of the OBD scan tool, and recommend that roadside mechanics in the country could take advantage of the Skills Development Fund (SDF) administered by council for technical vocational education and training (COTVET) in the country to upgrade their skills in the use of the modern methods of vehicle repair.

Key words: Roadside mechanic, On-board-diagnostics, Technology, Challenges, Opportunities.

Introduction

Technology can be defined as all the knowledge, products, processes, tools, methods and systems employed in the creation of goods or in providing services Khalil (2000), Technology and the use of computers have become part of life; things which were done manually centuries ago can now be done technologically with the use of computer. (Bennett et al, 2006). Sameness will be stagnation and people who do things the same ways as centuries ago are said to be archaic. (Robbins and Judge, 2007) Stated that no organisation or individual can afford to accept current level of performance or competitive pressure will drive them out of business. Individuals must continue to improve upon their technological skills in this technological age.

Motor vehicles which were manually operated some centuries back are now electro-mechanically operated. Computers are common place in modern day automobile design; braking, steering, starting and suspensions system are few examples of items now technologically operated. Duffy (1995).

Automobile technology has been evolving since the turn of the century. Santini (1992) stated that during the period from 1930 to 1970, the main body of automotive technology was mechanical; they were relatively simple for any roadside mechanic to repair. By the early 1980's the introduction of information technology in automobiles has triggered the most rapid technological advancement in the automobile industry. With the computers available, automobile designers have developed numerous sensors and controls. Now computers have even been used as a components parts for brakes, steering, chassis systems and other parts of automobile.

Technologies have recently been incorporated in all new automobile subsystems and have become standard implementation on many others. Such features as antilock braking system and airbag could only be achieved practically through the use of technology. These features are rapidly becoming standard features in all new automobile owing to change in customer's taste for automobile and status symbols attached to car ownership. All these systems require maintenance and repairs. The competencies required to maintain automobile of the 1900,s show little similarity with the competency required of the 1970s. Lindsay(2013), Stated that around 1970,s and 1980,s roadside mechanics used what is termed the 'try and error' to repair almost all automobiles. Rapid development of automobile technology has presented some challenging problems for roadside mechanics in the country. Ribbens(1998) , noted that the use of scan tools like On-Board Diagnostic, One, Two and Three (OBDI, OBDII, and OBDIII) are common place in the repair of automobiles in the manufacturer's approved service centre today. The on-board diagnostic (OBD) is an automotive term referring to a vehicle's self-diagnostic and reporting capability. OBD systems give the vehicle repairer access to the status of the various vehicle sub-systems and give the mechanic a clue as to where to look at when a problem occurs on the vehicle. But for one to be able to use this tool the mechanic must be able to understand the principles behind its usage.

The US Department of Labour statistics (2012) estimated that due to the increasing average lifespan of cars and growth in the number of cars being driven, the department projected the demand for automotive mechanics to increase 9% between 2012 and 2022. Those with specialized knowledge or training will have the best opportunities. The rate of change in technology is exponentially increasing. Nations, industries, and individuals must develop their capabilities to keep abreast of technological changes and to harness technology.

In Ghana, most of the vehicle maintenance and repair jobs are performed by roadside mechanics, this research seeks to find the challenges faced by these mechanics in the advent of automobile technology advancement and the opportunities available to these roadside mechanics so as to prevent them from becoming career disabled due to increase in vehicle technology.

Data collection methods and analyses of results

For data collection, survey research method was used. (Floyd and Fowler, 2002) stated that survey research method has the ability to produce statistics, that is quantitative or numerical descriptive about some aspects of the study population. Generally survey research methods also allows the researcher to collect data from a fraction of the population. That is, a sample, rather than from every member of the population.

Fifty open-ended questionnaires divided into six sections were randomly administered to fifty garage owners (roadside mechanics) in the TarkwaNsueam township. This was to seek their views about the current changes in automobile technology and its impact on their jobs as garage owners. Section one sought to know whether those garage owners knew about the current technological changes in the repair of modern automobiles. Section two also tried to know how many of those mechanics had the requisite equipment (scan tool) to diagnose and repair modern vehicles. Section three assessed if those garage owners were willing to be trained in the modern methods of repairing automobiles. Section four sought to find out if those garage owners without the scan tools were willing to close down their garages to find a

well-equipped automobile workshop to work for salary. Section five also tried to find the current academic qualifications of those garage owners, and finally section six sought to find out if those garage owners were still interested in using the ‘try and –error’ methods of repairs or will like to upgradetheir knowledge in the form of training or refresher courses on the current use of the OBD scan tool.

Results

This section discusses the results obtained from the questionnaire. The result from the questionnaire is represented in graphical representation for easy understanding and is grouped in sections based on the items in the questionnaire.

Mechanics with and without OBD scan tool

The responses from the questionnaire section one, which sought to find out if the mechanics were aware of the current revolutionary change in automobile technology, revealed that all the roadside mechanics(garage owners) in the TarkwaTownship were aware of a paradigm shift in the modern methods of repairing automobile, i.e. the use of computerised equipment, the scan tool, but the findings showed that 88per cent of the respondents do not have the scan tool to troubleshoot and diagnose fault on the modern vehicles and still use the try-and –error method of repairing. See figure 1.

All the mechanics who do not have the OBD scan tool agreed that if a client’s problems could not be solved with the Try-and Error method, they would be willing to redirect them to a well approved manufacturer’sgarage which uses the OBD scan tool. This in effect is a threat to businesses of the roadside mechanics who do not have the OBD scan tool technology

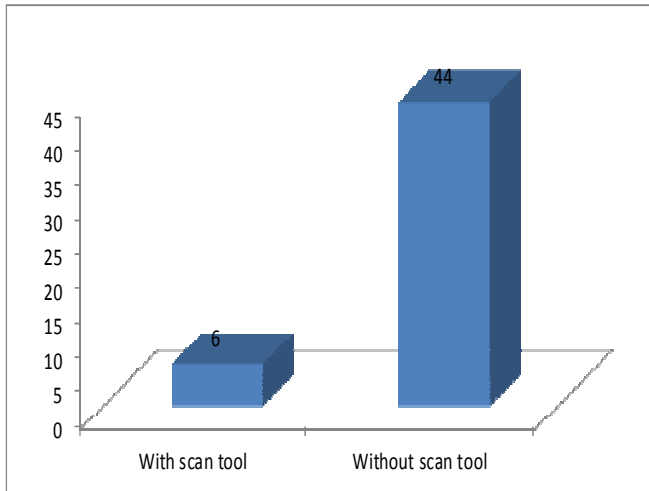


Figure 1. Mechanic with and without scan tool

Eighty eight (88) percent of the respondents agreed that the modern automobile pose a great challenge to the continued existance of their operations especially during trouble shooting and finding a solution to a problem with the try-and-error method, but were not willing to close down their shop to go and work for the manufacturer’s approved serviceshop. See figure 2.

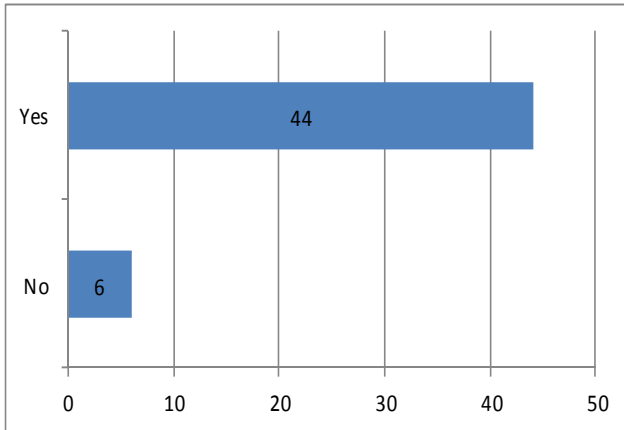


Fig 2. does modern vehicles pose a challenge in terms of repair.

Willing to be trained to use the OBD scan tool

Respondants were asked if they were willing to be trained to use the scan tool to help them in their daily work, (section three). There was 100 a percent affirmative response from the respondents indicating their eagerness to forgo the try-error method of repairing morden automobiles and be trianed in the use of OBD technology.

Garage owners who are willing or unwilling to close their shops

Section four sought to find out if those garage owners without the scan tools are willing to close down their garages to be employed by a well-equipped automobile service garage.. Figure 3 depicts the responses from the respondents.

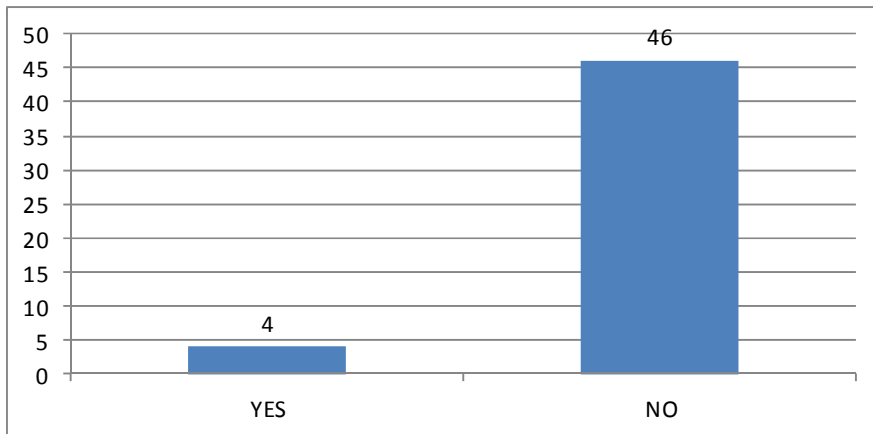


Fig 3. garage owners who are willing or unwilling to close their shops

Qualification for the roadside mechanics

Section five also sought to find the current academic qualification of these garage owners. Figure 4 shows the current qualification levels for the garage owners in the TarkwaNsueam Township. The figure shows that 28 of the respondents (representing 56%) of these mechanics had Trade Test Grade Two which is a minimum qualification for someone to become a motor vehicle mechanic in Ghana. Four of the respondents (representing 8%) had a Trade Test Grade One which is one step higher than the Trade Test Grade Two. Other four of the respondents, (representing 8%) had City and Guilds intermediate qualification from technical collages. Fourteen of the respondents (representing 28%) had no formal educational qualification. (Illiterate).

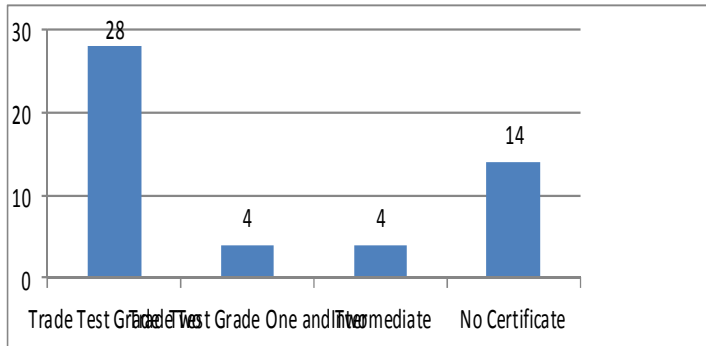


Fig4. Qualification for roadside garage owners

Respondents interested in using OBD Scan tool

Section six of the questionnaire sought to know whether the respondents were interested in continued use of the try-and-error method of repairing automobiles in the advent of the increased intechological advancement. One hundred per cent of the respondents indicated their preference in the use of the OBD scan tool to troubleshoot and diagnose a problem against the try-and-error method.

Discussion

Lack of the required equipment (OBD scan tool) was observed as one of the major factors contributing largely to the challenges facing roadside mechanics in the Tarkwa Township. Figure 3 revealed that out of the 50 respondents (representing 100%), of garage owners (roadside mechanics) in the Tarkwa Township only six of them (representing 12%) had a OBD scan tool for troubleshooting and diagnosing a problem. All modern vehicles have an OBD point installed in them for scanning purposes and require a scan tool to enable correct diagnosis of faults. Another challenging factor was the lack of education and proper upgrading of skills among the roadside mechanics. Figure 2 shows that 28 respondents (representing 56%) of the garage owners had only trade test grade two certificates; 14 of them (representing 28%) of the mechanics had no trade test qualifications qualifying them to be mechanics. Four of them had trade test Grade One certificate, and the rest, (representing 8%) had intermediate certificate in automobile engineering from senior high technical school. It was also observed that only 6 of the garage owners, (representing 12%), had the basic knowledge in the repair of modern vehicles using the scan tool (OBDII) as they owned the tool (See figure 1). Aside from the normal practical skills, modern vehicle using OBD system require a complete knowledge of the function and operation of various parts before one can be able to carry out an effective repair on OBD- equipped vehicles.

Conclusions

Obviously as the vehicle becomes more technological in nature the task of repairing it also changes. The days of being only mechanically inclined are gone for most roadside mechanics. Now the general engineering mechanic and roadside mechanics or diagnosticians must be able to understand and appreciate the use of technology as a business tool. Once the mechanic understands how the technology behaves, the vehicle of today will not be complicated to repair as they may think. If roadside mechanic in Tarkwa Township fails to adapt to technological changes and advance accordingly, Ghana will lose competent mechanics some few years to come because of their inability to convert or adapt technological changes to modern methods.

Recommendations

There is a social cost that a nation pays if those with the needed skills were untrained or neglected. For a country like Ghana to sustain and support businesses, roadside mechanics who contribute to economic growth of the country should be given every opportunity to undergo a series of training to upgrade their technical knowledge in the use of the On-Board-Diagnostics tool (OBD) and basic vehicle electronics training through the Skills Development Fund (SDF) initiative. A government subsidy given to roadside mechanics (entrepreneurs) to upgrade their knowledge in their trade area is likely to bring more benefits in terms of employment generation. The government of Ghana could also give these tools (scan tool) for these mechanics on hire purchase.

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