Advances in Social Sciences and Management
February 2024, Vol-2, No-2, pp. 37-62.

Determinants of Training Needs, Life Long Education and Learning Among Roadside Motor Vehicle Mechanics Artisans in The Informal Sector in the Maintenance and Repairs of Modern Motor Vehicle for Sustainability

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Abstract:
As a result of the complexity of the innovative technologies embedded in the modern motor vehicles components, systems, sub-systems and because of the increasing sensitivity in technology transfer which has consequently facilitate the assimilation and adaptation of technology, has posed a challenge to the informally trained roadside motor vehicle mechanics in the repairs and maintenance of modern motor vehicles which suffice the training needs and lifelong education and learning for sustainability of service workshops. The study was design to identify the determinants of training Needs and Life Long Education and Learning among Roadside motor vehicle mechanics artisans in the informal sector in the maintenance and Repairs of modern motor vehicle for sustainability and proffering ways government policies could be fashioned towards sustainable lifelong education and learning for the informally trained motor vehicle mechanic artisans. Four research questions were stated in line with the specific purpose of the study. Quantitative analysis using descriptive survey research and qualitative analysis using Interpretive Phenomenology Analysis research design (IPA) design was adopted for the study. The population for the study is 63 comprising the master craftsmen informal sector of motor vehicle repair and service workshops and 25 respondents from the ministry of labour and productivity and the national directorate of employment. Questionnaire items developed from literature to answer research 1 and 2 while in-depth and focus group discussion (FGD) was used to answer research question3 and 4. It was therefore recommended that the efforts of the roadside mechanics in automobile maintenance could be enhanced by providing means for their training needs and lifelong education and learning programme for sustainability and also stakeholders should implement initiates for coping with the challenges of the innovative technologies in modern motor vehicles.

Keywords: Training, Lifelong Education and Learning, Roadside Motor vehicle mechanic, Artisans, Innovative technologies in modern motor vehicle, Informal sector.

INTRODUCTION

Successive Nigerian governments have taken a number of actions to promote the growth of the industry in recognition of the significant role that the car industry plays in the country's economic structure (Ogwo & Ede, 2003). The National Automotive Policy in the Informal Sector is one of the actions the government has made (Francis et al., 2017). The automotive policy for Nigeria was created by the NAC (National Automotive Council) with participation from the Nigerian Automobile Manufacturers Association, NAMA, Nigerian Automotive Technician Association, NATA, and other industry organisations. The policy received presidential assent on December 30, 1992, and the transitional council later approved it on August 10, 1993. On August 23, 1993, the

policy document was finally released. The agreement called for the National Automotive Council to be established as a parastatal under the Federal Ministry of Industry. The council was established with the support of Act No. 84 of August 25, 1993 (Ogwo & Ede, 2003). The main goal of the national automotive policy was to use local personnel and material resources to secure the survival and expansion of the Nigerian automotive sector. This is done in an effort to increase the industry's contribution to the national economy, particularly in the areas of people- and goods-transportation (Vanguard, 2017).

The Nigerian Automotive Industry Development Plan (hence referred to as "NAIDP") and action plans were created by the National Automotive Council (hereinafter referred to as "NAC") and will run from June 2014 to November 2019 (a length of 54 months), with a one-year preparation period from June 2014 to May 2015. This plan aims to support the automotive industry and implement various measures to draw investment, with a focus on developing automotive supplier parks in three regions, actively luring foreign automakers, assisting the growth of local content manufacturing industry, human resources development in the automotive industry by the establishment of industrial standards for certification of safety and quality of products.

The elements of the objective of the NAP according to Vanguard (2017) included; Provision of automotive vehicles for urban and rural areas, accelerated technological development of the Nigerian economy, increased employment opportunities for Nigerians, conservation of scarce foreign exchange, establishment of integrated Automotive Industry in Nigeria, standardisation and rationalisation of the Nigerian automotive industry, increased private sector participation in the establishment of the auto industry, technology acquisition; and creating conducive operational environment for the informally trained roadside motor vehicle mechanic through the introduction of appropriate fiscal policy and monetary incentives.

According to Liimataimen (2003), the term "informal sector" is frequently used to describe the portion of the labour market in developing nations that has taken on a sizable number of job seekers, particularly in self-employment and for workers in very tiny industrial units. Informal activities frequently fall outside the purview of official statistical enumeration, governmental regulations, and formal systems of labour and social protection. They are frequently characterised by low levels of capital, skills, access to organised markets, and technology; low and unstable income; poor and unpredictable working conditions. According to Messina (1994), the informal sector is a process that involves both a group of people that are economically insecure and frequently live below the poverty line.

According to Kent and Musli (1995), the informal sector is defined as people or groups operating lawful businesses, some of which may be subject to governmental regulation, but the vast majority of which operate outside of such laws. According to STATECO (2005), any production units without an administrative registration number and without formal written sets of accounts (accounts allowing the generation of an operational account and a balance sheet) are considered to be part of the informal sector. This definition is the one that is most frequently used in the many statistical studies of the informal economy in Africa, particularly in Nigeria, and it was acknowledged by all the stakeholders as being very operational it nevertheless contributes to reflections on the most legitimate way of approaching the nature and specificities of the sector activities (Walther, 2007).

According to Ekpo and Umoh (2012), the term "informal sector" in Nigeria refers to economic activity carried out in any sector of the economy beyond the scope of governmental rules. According to Magbagbeola (1996) in Ekpo and Umoh (2012), this sector may be undetected, irregular, parallel, non-structured, in the backyard, underground, or subterranean. It may also be undetectable. In Nigeria, informal economic activities cover a wide spectrum of small-scale, mostly self-employed enterprises, and the majority of them are conventional jobs and manufacturing techniques.

In the majority of developing nations, the informal sector is a vital one. Due to the formal sector's poor performance, it has grown in importance as a source of income and employment (Njagi Njeru and Mugi, 2018). For those who do not meet the entry standards for universities, the government has developed efforts for skill development in tertiary institutions. However, these initiatives don't deal with the issues facing young people who drop out of the official education system in primary school and make up the bulk of workers in the unorganised sector, as is the case in Nigeria. In fact, the majority—57% of the authorised Micro, Small, and Medium-Sized Enterprises (MSME)—are run and owned by individuals with at least a primary level certificate and starting salaries or starting capital of less that N200,000 (Ogwo &Ede, 2011).

The unorganised industry in Nigeria includes a variety of trades, including furniture making, woodworking, floor tilling, building, and welding fabrication. Roadside mechanics who operate in the automotive trades of motor vehicle body construction, auto electrician, spray painting, vulcanizing, motor vehicle upholstery making, and motor vehicle mechanic/engine repair work are also included in the informal sector. This essay will concentrate on informal roadside motor vehicle mechanics. According to Arvil, Adams, Johansson de Silva, and Razmara (2013), there is unquestionably a skills gap between what the market demands and the abilities competencies of the artisans in the informal sector. In response to a pressing need for establishment, the National Directorate of Employment (NDE) was established in 1986 following a compelling necessity for the establishment of a permanent organizational mechanism of tackle the problem of unemployment in Nigeria (NDE,2023).

For developing nations in general and Nigeria in particular, the 1980s global economic recession grew steadily worse. The country's industries were completely shut down as a result of a sharp decrease in capacity utilisation. The Structural Adjustment Programme (SAP), the devaluation of the naira, privatisation, and commercialisation of the economy are other macroeconomic policies that were implemented by the government at the time. The NDE's mandate is as follows: Small Scale Enterprises, SSE: Small Scale Enterprises, SSE: The Department promotes the creation of micro businesses as a means of employment and provides business training. Programme for the Development of Vocational Skills. The Department encourages the formation of micro businesses as a means of employment and offers business training, which is the subject of this study; Rural Employment Promotion, REP: The Department encourages the formation of micro businesses as a source of employment and offers business training; Special Public Work (SPW): The Department encourages the formation of micro businesses as a means of employment, such as roadside mechanics, and offers business training.

When it comes to offering car diagnosis, repairs, and maintenance services, roadside motor vehicle technicians in Nigeria are quite strategic. Roadside motor vehicle mechanics are those who have a skill set involving vision, hearing, smelling, and feeling abilities. They adopt and also apply the "try and error" approach in detecting malfunctions and repairs. These services range

from helping stranded drivers along the road by manually diagnosing and repairing vehicle faults as soon as possible or moving the vehicle to a safe place off the road where they can systematically locate and repair possible faulty components. According to reports, approximately 5,000,000 roadside motor vehicle mechanics in Nigeria employ the "trial and error" method to identify car problems.

The difficulties faced by roadside motor vehicle mechanics have gotten worse as the technology required to diagnose, repair, and maintain modern vehicles advances. This is because the skill set of trial and error alone is insufficient for the best diagnosis, repair, and maintenance of OBD II enabled vehicles (Olaitan and Ujevbe,2020) i.e., vehicles that incorporate the OBD II system and require computer based-software to enable interaction between the vehicle and the roadside motor vehicle mechanic on of which is Alldata (Maigida and Francis,2014).

The number of vehicles, miles driven, and average vehicle performance have all increased significantly as a result of the innovations incorporated into modern motor vehicles, according to National Academies of Sciences, Engineering, and Medicine (2021). This is because of the fuel economy requirements for efficiency and emission control of the motor vehicle. By model year (MY) 2017, many efficiency innovations, such as variable valve timing, gasoline direct injection, 6-speed or higher gearboxes, and decreased tyre rolling resistance, have attained better than 25% penetration (NASEM, 2021). As compared to the regulatory baseline, MY 2017 vehicles also demonstrated better than 15% penetration of variable valve lift, turbocharging, continuously variable gearboxes, stop start, and 10% improvements in both aerodynamics and mass reduction (NASEM, 2021).

Alternative fuel-efficient vehicles have been created, made available as model options, made commercially viable, and enhanced in functioning. In order to advance from 2017 to 2025, automakers may pursue various paths for efficiency improvements, but the least expensive ones may involve lowering road loads like rolling resistance, aerodynamic drag, and mass, as well as engine technologies like the use of Miller and Atkinson cycles along with cooled exhaust gas recirculation (EGR), as well as transmission technologies like 8-, 9-, and 10-speed transmissions (NASEM,2021). This scenario represents the "state of the art" in roadside auto maintenance and auto diagnosis. It is noteworthy that newer models of automobiles are made up of newer technology as mentioned above of which the roadside mechanics are unfamiliar. This situation is the "state of the art" regarding roadside motor vehicle mechanics in again in motor vehicle diagnosis. It is noteworthy that newer models of automobiles are made up of newer technology of which the roadside mechanics are unfamiliar especially in Nsukka urban of Enugu State particular.

According to Ede and Olaitan (2010), the responsibilities of the roadside mechanic include providing services and maintenance work on; adjusting, repairing, rebuilding, and replacing damaged parts of a car engine. Additionally, it entails making major or minor repairs to the motor vehicle's air conditioning/systems, lubrication systems, fuel and exhaust systems, steering, suspension, and braking, as well as computer and electronics/electrical systems, cooling, fuel, and exhaust systems. It also involves performing general service station mechanic work (Salami, 2017). Ogwo and Ede (2010) pointed out that the integration of a huge number of basic and advanced electronic components, computer systems, and various other micro electromechanical systems into the automobile was made possible by advancements in electronics technology. These include, among others, brake-by-wire and throttle-by-wire systems, integrated electronic

braking, integrated electronic ignition, electronic security systems, on-board diagnostic systems, and service interval reminders. Roadside mechanics cannot service and maintain current motor vehicles with this electromechanical component.

Modern motor vehicles have advanced technologies that are beyond the scope of the average roadside mechanic. These systems include steering and suspension systems, braking systems, cooling systems, electrical systems, fuel and exhaust systems, lubrication systems, transmission/transaxle systems, air conditioning/systems, and electronics systems, which are the primary component and engine of today's cars (Erjavec, 2010). Automobile electricity, computer technology, electronic or mechatronics (mechanical components controlled by electronics), use of computers in motor vehicles through the engine control unit (ECU) via sensors and actuators, on-board diagnostics (OBDII) systems, electronic stability programme, anti-lock braking system, traction control systems, and electronic fuel injection systems are among the innovative technologies in modern motor vehicles components, systems, and subsystems exhaust gas circulatory systems, variable valve timing intelligence systems among others (Halderman,2012).

These innovative technologies also comprised of electronic fuel injection, gasoline direct injection, electronic carburetor, variable valve timing intelligent and cam operated (VVTi), electronic ignition, super charging (slow and turbo charging), and the emission control systems (exhaust gas recirculation systems EGR, catalytic converters (Halderman,2014). On the safety innovations according to Halderman, (2014) these include anti-lock braking systems (ABS), all wheel driving and steering systems (AWDS), speed limit alarm systems, electronic stability control, traction control systems and airbags (self-restraint systems, SRS). The maintenance and repairs of these innovative technologies in modern automobiles require some knowledge of auto-electricity/electronic or mechatronics which involves the study of computers/electronics in automobiles (sensors and actuators) which is relatively new to these roadside motor vehicle mechanics in the informal sector. For the informally trained mechanics to service the modern motor vehicle, they must understand not only the mechanical parts, nomenclature and operations, but must also understand the computer/electronics parts, diagnosis and service procedures for each system in the motor vehicle (Hiller and Coombes,2007). Ogwo (2007) stated that in the formal automobile sector, major vehicle distributors are making conscientious efforts at equipping their workshops and retraining their technicians, same cannot be said of those in the informal sector. For the informal automobile sector to be improved, the informally trained motor vehicle mechanics must conform with the innovative technologies in modern motor vehicles for sustainability through lifelong learning and education and also inputs of productive resources like credit facilities, raw materials and tools, technology and training have to be accessible for these craftsmen (ILO, 2012). For the roadside mechanic to continue to be relevant and for sustainability, there is need to identify training needs for Lifelong education and learning in coping with these innovations in modern motor vehicle.

Self-directed education that is centred on personal growth is called lifelong learning. Although the term "lifelong learning" has no agreed-upon meaning, it is typically understood to refer to learning that takes place outside of a traditional educational institution such a school, university, or business training (Valamis, 2023). The continuous, voluntary, and self-driven pursuit of information for either personal or professional objectives is referred to as lifelong learning. In addition to promoting social inclusion, active citizenship, and personal growth, it is crucial for a person's competitiveness and employability. According to Billet (2014), lifelong learning is focused on how individuals may sustain and improve the viability of their workplace and work

together to achieve societal, economic, and political objectives. Similar to this, the OECD (2000) reported that lifelong learning is linked to a person's employability over the course of their working life.

However, lifelong learning does not have to be limited to unstructured learning. It is best described as voluntary and intended to bring about personal fulfilment. This could be accomplished through informal or formal instruction. According to Valamis (2023), lifelong learning can aid us in achieving personal fulfilment and pleasure, regardless of whether we are following our professional aspirations or our personal hobbies and passions. It acknowledges that humans have a natural desire to explore, learn, and grow and exhorts us to do so by paying attention to the principles and objectives that motivate us. The fundamental elements of lifelong learning, according to Valamis (2023), are voluntary, self-motivated or self-initiated, doesn't always involve financial investment, is frequently informal, self-taught or instruction that is sought, and is motivated by a desire for personal growth or interest. Adults must continue their education to remain job-competent in the face of evolving occupational norms and shifting workplace demands (Billett, 2017). According to Valamis (2023), the term "lifelong learning" is typically used to describe learning that takes place outside of traditional educational institutions like schools, universities, or corporate training.

On the other hand, lifelong education combines andragogy and paedagogy. It can be delivered through a variety of methods, including correspondence courses, continuing education, e-learning, and distant learning. Due to the lengthening of formal education and the inadequacy of school-acquired skills for future employment and success, the idea of lifelong learning has been evolving continuously. With the goal of improving life quality, lifelong education originally emerged as a combination of informal, formal, and non-formal education. However, the notion has since expanded to include all eras and locations, beginning with birth and continuing until death (Field, 2010).

It is necessary for the government or other relevant agencies to create policies and allocate resources for lifelong education. These agencies encompass a wide range of informal, non-formal, and formal settings where choices are made (Iqbal, 2009). According to proponents of lifelong learning, education is a process that lasts the entirety of one's life. Its goals and forms must be modified to meet the needs of people at various stages of development (Iqbal, 2009).

Formal, informal, non-formal, and independent training is necessary by the concerned individual, in this case, the roadside mechanic, in order to achieve the goal of acquiring knowledge in the relevant field or trade, activation of civic conscience, expansion of employment opportunities, and social integrations. Lifelong education is connected with the aim of improving one's knowledge, skills, and competencies with personal civic and social perspectives (including employment aptitude). According to Zaki (2018), lifelong education is different from institutionalised education since it is more flexible and increases learning chances through reading, study, and instruction. The freedom of persuasions of the training curriculum, of interest to the roadside mechanic, is where there is flexibility in this respect. Typically, learning is a modular system of packages at designated workshop service locations.

The provision of interventions through lifelong learning and education that will facilitate the skill, knowledge ability, employability, sustainability, and empowerment of the entire informal automotive sector should therefore be made to the roadside mechanics in order to help them

cope with the demands of the inevitable effects of globalisation on the automotive industry. This might be accomplished, among other things, by enhancing the roadside mechanics' knowledge base through training.

The results of the study by Njagi Njeru and Mugi (2018) on Skills and Competency Gaps Analysis of Motor Mechanics in the Informal Sector: A Case Study for Meru Township in Kenya show that the market needs for training facilities are not being met by training institutions, and the skills gap does not match the automotive industry's rapidly changing technology. Insofar as it is designed to precisely address the particular demands of the informal sector, the Competency-Based Education and Training (CBET) framework for lifelong education and learning may fill in the gaps.

According to Santander Universidades(2022), sustainability is the ability to meet the requirements of the present without compromising the needs of future generations while maintaining a balance between economic development, environmental protection, and social well-being. Market-based tools called sustainability systems are created to tackle today's most critical social and environmental problems. They empower individuals to have an influence (ISEAL, 2023). Sustainability systems are utilised in various industries worldwide to successfully enhance social and environmental performance by establishing responsible practises, evaluating the application of these practises, and tracking impacts through time. Market change propels advancement on a number of international issues, including the UN sustainable development goals. Multi-stakeholder sustainability systems offer specific rules and indicators to aid in resolving the social and environmental problems outlined in global goals, and in doing so they provide platforms for collective action across sectors and supply chains (ISEAL, 2023).

There are three main types of sustainability, according to Santander Universidades (2022), including environmental sustainability, which emphasises biodiversity preservation without sacrificing economic and social advancement. Protecting water, conserving energy, cutting waste, utilising recyclable packaging, decreasing or eliminating the use of plastics, adopting sustainable transportation, reusing paper, and protecting flora and fauna are the cornerstones of environmental sustainability. Economic sustainability, which is designed in a way that when a company is established, a framework is developed that involves expenses and revenues in the instance of this study, the roadside repair workshop is another type of sustainability. The business makes money once both aspects are in balance. The ability of a company to appropriately manage its resources and produce profits is referred to as economic sustainability in the long term.

The roadside mechanic shop is a classic example of this type of sustainability. It is required or intended to implement a strategy to establish a balance between sustainability and the economic performance of the motor vehicle mechanic workshop through lifelong education and learning. Finally, there is social sustainability, which is sufficient to say that there are three interconnected types of sustainability in any society where economic activities are carried out in a particular environment: environmental, economic, and social. Roadside mechanics are an example of a specialised trade group with a high sense of cohesion, and social sustainability in particular aims to promote the cohesion and stability of these groups (Santander Universidades, 2022). For the Sustainability of the skills, attitude, competence, empowerment and aptitude of the roadside mechanic in their workshop, is will require some level of training in lifelong learning and education.

Training is the process of imparting knowledge and abilities that pertain to certain practical capabilities, either to oneself or to others. A person's capability, capacity, productivity, and performance are all specifically improved by training (Wikipedia, 2023). Eyibe (2000) defined training as the process of giving someone a limited skill set so they can accomplish a task without necessarily knowing the underlying principles. He believed that training's major goals are the development of intelligence and the acquisition of a limited competence or skill.

The kind of training required by roadside mechanics in the informal sector is specifically technical or technology instruction. Mytelka and Tegfachew (1999) defined technological training as the process of creating a firm's technological capacity through which they gain the tacit knowledge necessary to maintain their productivity. The process by which mechanics develop their knowledge bases on the automobiles they service in the informal automotive sector in order to stay in business (Ogwo and Ede, 2010).

In order to increase production, diversification, revenue, a good rate of return, and occupational safety/health, technical training is desperately needed in the unorganised sector (Fluitman and Haan, 2002). Due to the industry's growing sensitivity to technology transfer methods that aid in the assimilation and adaption of technology (Odetola, 1993), training has become essential. Although the ILO (2012) emphasises the need for national training policies to be made more aware of these needs, it has been shown that planned training interventions are generally more successful when beneficiaries (Trade Associations) are involved in their planning and when the existing structure is reoriented towards it (Limatainen, 2002; Fluitman and Haan, 2002).

Training in the informal sector should, however, not strictly be tailored after the formal training design rather it should bear the strengths from both types of training (Limatainen, 2002). Indeed, it is a wrong policy assumption that technological learning/innovations will emerge automatically in time through learning by doing (Oyelaran-Oyeyinka, 2000) especially ones at its emerging stage. A skill empowered informal automobile sector will likely provide better organization, capital accumulation, additional employment and income generation (Voh and Yunussa, 1993). Thus, this valuable sector needs the attention of major stakeholders in order to institute a viable lifelong education and lifelong learning.

Modern motor vehicles use innovative technologies that these technicians are not familiar with and thus require some amount of training on new skill sets through lifelong learning. A person new to diagnostics will not only fail to find the fault but introduce more faults into the system in the process, which if care is not taken can lead to complete breakdown of the motor vehicle system and customers/client dissatisfaction (Denton, 2014). It has been observed that some of these mechanics lack the expertise on the computer and electronic technologies in modern motor vehicles. What they do during diagnosis is trial by error and frequently with the best of intentions (Denton, 2014).

The owners of motor vehicles, as well as the mechanics working in the maintenance, repair, and service industries with less formal training, run the risk of falling behind in knowledge in today's knowledge- and skill-based economy. The untrained auto mechanic should receive assistance in adjusting to the requirements of the unavoidable effects of globalisation in terms of technical skill training. This might be accomplished by increased understanding, the creation of skill-training programmes on advancements in contemporary auto technology, and accurate tracking of the sector's growth. Consequently, the following research topics are addressed in this study:

1. What are the training needs of the roadside mechanics artisans in the informal sector in the service and maintenance of modern motor vehicle for lifelong learning and education for sustainability?
2. What are the modalities for which the training needs can be obtained by the roadside motor vehicle mechanic artisans for lifelong learning and education for sustainability?
3. What are the procedures for the lifelong learning and education as needed by motor vehicle mechanic on the service and maintenance of modern motor vehicle?
4. What are the ways government policies could be fashioned towards evolving sustainable lifelong learning and education for the informal roadside motor vehicle mechanic artisans?

LITERATURE REVIEW

Lifelong Learning and Lifelong Education

Lifelong learning which is equally referred to as Self-directed education that is centred on personal growth is called lifelong learning. Although the term "lifelong learning" has no agreed-upon meaning, it is typically understood to refer to learning that takes place outside of a traditional educational institution such a school, university, or business training (Valamis, 2023). The continuous, voluntary, and self-driven pursuit of information for either personal or professional objectives is referred to as lifelong learning. Additionally, to promoting social inclusion, active citizenship, and personal growth, it is crucial for a person's competitiveness and employability.

According to Billet (2014), lifelong learning is focused on how individuals may sustain and improve the viability of their workplace and work together to achieve societal, economic, and political objectives. Similar to this, the OECD (2000) reported that lifelong learning is linked to a person's employability over the course of their working life.

On the other hand, according to Marjan (2011), stated that lifelong learning and education combines andragogy and pedagogy. It can be delivered through a variety of methods, including correspondence courses, continuing education, e-learning, and distant learning. Due to the lengthening of formal education and the inadequacy of school-acquired skills for future employment and success, the idea of lifelong learning has been evolving continuously. Lifelong education was initially emerged as a blend of informal, formal and non-formal education with the aim of improvement in quality of life but now the concept covers all times and all places, starting from birth and ending at death (Field, 2010).

According to Biao (2010), the term "lifelong education" was coined in the 1970s when people began to realise that if they didn't start accepting the idea of lifelong learning, the speed and effects of technological advancements would eventually overwhelm them and cause them harm. Therefore, the idea of lifelong education was born out of the need for man to learn about technology and to continuously learn how to use technical advancements, which were flooding the market at a dizzying rate, safely. From this point forwards, numerous researchers looked into the advantages of lifetime learning and education; their work has thus far shown us that, although the development of lifelong education was justified by the necessity to use technology and its by-products safely, the promotion of lifelong education can indeed be justified on biological, economic and social grounds.

The terms "life," "lifelong," and "education" make into the term "lifelong education" (Field, 2001). Lifelong education encompasses all stages of education; it includes formal, non-formal, and

informal patterns of education, planned as well as incidental learning (EU, 2018). Education does not end with the completion of formal schooling; rather, it is a continuous process. To enhance life quality, lifelong education aims for continuity and articulation as well as vertical and longitudinal integrations and dimensions at every stage of life.

It is important to understand what lifelong education and learning entail. Lifelong education is a set of experiences generated in the social world, manifested in the form of social suggestions that comprises specific forms, norms, and practices with the intention to realise specific kinds of change in people, according to Billet (2003). Lifelong education is initiated and enacted by individuals, quite likely in a personal particular way as shaped by ontogenetic development or legacies of life histories.

At least three other factors make these two ideas distinct from one another. First, most, if not all, of the learning that adults acquire to maintain their employability throughout their working lives occurs from experiences in their working lives rather than through educational programmes. We need settings that recognise, allow for, and foster learning, frequently in ways that are dissimilar from those offered by traditional educational settings. Second, it is not enough to directly link the learning processes of people to the experiences that make up teaching or guiding (such as educational programmes). The process by which people interpret their experiences—both inside and outside of deliberate educational experiences—results in a large portion of what they learn (Donald, 1991).

Despite the kinds of assurances that governments and employers desire, curriculum theorists fully comprehend that there can be no assurances regarding what will be learned for educational or other activities. In the end, how and what people learn depends on how they interpret and build the information they come across. To see lifetime learning as either compatible with or a byproduct of lifelong education is therefore insufficient. Third, it's critical to comprehend which contributions to lifetime learning make way for particular types of learning. If employers and government agencies are concerned about the skills necessary for employability, it is important to understand what experiences people need to engage in in order to gain these skills. Beyond acknowledging what is afforded by workplace, educational, and community settings, accounting for how individuals' experience and mediate those affordances is essential.

Billet (2010) developed a set of categories based on the following premises to analyse the relationship between lifelong learning and lifelong education: foundation category, enactment, outcomes, antecedents, meditational means, and manifestation of paid employment. Billet (2010) provided a more detailed breakdown of each of these sets of categories based on the differences between lifelong learning and lifelong education. Lifelong learning includes personal factors and goals, the process of experiencing learning and development, individual knowing and knowledge, knowing what one knows, can do, and values, while lifelong education includes institution/social factors and goals, the provision of experiences, and societal continuity. These are all elements that the roadside auto mechanic should consider in skills upgrading, workplace attitude and sustainability.

Innovative Technologies, Learning and Evolution of Skills in Modern Motor Vehicle Systems

Modern motor vehicles feature a number of cutting-edge technologies that have influenced consumers and led to significant advancements in automobiles. Electronic fuel injection, gasoline direct injection, variable valve timing intelligence, double overhead cam (DOHC) operation,

electronic ignition, supercharging, turbocharging, emission control system, exhaust gas recirculation, catalytic converter, electronic stability control (ESC), traction control, and variable headlamp control systems are just a few of the technologies mentioned (Schwaller, 1993; Nice, 2001; Erjavec, 2010; Halderman, 2012; Halderman, 2014). Additionally, dual fuel systems that enable the use of either gasoline or natural gas by simply switching the supply circuit have proven to be quite cost-effective. The solenoid-operated fuel injector used in the full electronic system opens at a predetermined (intermittent) moment in the engine cycle and is held open for a duration proportional to the amount of fuel required (Hiller, 2004). The method used to monitor the air flow—indirect (indirect-sensed) versus direct air flow measurements—distinguishes completely electronic systems from those of various manufacturers.

Innovations in the area of safety features include, for example, the Electronic Stability Programme (ESP), Traction Control System, All Wheel Steering System, Speed Limit Alarm, Air Bags, and so forth (Nice 2000; Halderman 2014; Denton,2011). Complete tyre lock during emergency braking, which frequently results in loss of vehicle control, is avoided by the ABS. In the event of a significant crash, airbags are nylon bags that inflate and deploy to protect the car's occupants. The airbag, which is folded like a parachute (at the wheel hub or seat side panel), inflates if an impact of a particular minimal severity is detected by the vehicle's crash sensors. It's critical to emphasise that these modifications to the automobile technology had been primarily changing from mechanical to electronics component (Denton,2011).

There are a variety of elements that have been found to affect technological education, innovation, and skill evaluation in emerging nations. The likelihood of adopting new technology is directly and considerably influenced by the target group's degree of education (Mbanefo, 2001). Following are the learning channels that Oyelaran-Oyeyinka (2000) identified as having an impact on technological learning: the apprentice system of training; the support mechanisms offered by public institutions; learning through transactions with local and external agents and learning by doing; production and maintenance.

These elements influence technological learning in the unorganised motor vehicle repair sector in various ways regarding supply variables, informal sector technological learning is mainly influenced by the nature of the technology, technological information, education, and stimuli/maturation (Dodgson, 1991). The degree to which motor vehicle technicians are able to meet the needs of motor vehicle repair and maintenance is influenced by a number of different elements, both separately and in combination. Combinatorial is prone to knowledge lag and minimal learning when novel motor vehicle technology become increasingly complicated against the background of the motor vehicle mechanic's poor degree of education. On the basis of the demand factor, input, market, and modifications in global technology transfer, the informal sector's technical learning is significantly impacted. It's critical to observe the dearth of writing on literature on firm level dynamics of technological learning in the informal sector (Dodgson, 1991) There are many definitions of technological learning and how it relates to the development of automobile technology in the literature. For instance, Mytelka and Tegfachew (1999) defined it as the process of technological capability building through which firms acquire the tacit knowledge necessary to sustain their productivity. In the case of the informal sector motor vehicle mechanic, it is the process by which the mechanic develops their knowledge in the processes/products. The maintenance activities in the informal motor vehicle repair entails "firm" level technological learning, especially lifelong learning and education in repair and rectifying faults in vehicles and fabrication of products over improving replacement parts. Hence, the need

to determine the training needs and lifelong learning and education among roadside motor vehicle mechanics artisans in the informal sector in the repairs and maintenance of modern motor vehicle in Nigeria.

METHODOLOGY

A mixed method research design was employed for the study using quantitative analysis and qualitative analysis. Mixed methods research is a research method that combines and integrates qualitative and quantitative research methods in a single research study. It involves collecting and analyzing qualitative and quantitative data to understand a phenomenon better and answer the research questions. The central premise of using mixed methods research is that it makes the most of the strengths of each data type while neutralizing their weaknesses. Researchers combine qualitative and quantitative methods to expand their evidence, improve the credibility of their findings, and illustrate the results from one method with the results from the other one (Johnson, & Schoonenboom,2017). The quantitative analysis employed in this study is survey research design to elicit information from the master crafts men who happens to be the owner of the road side workshop. Survey research as explained by Frankael, Wallen and Hyun (2012) is seeking opinion from large or small population or sample using questionnaire, interview schedule, observation in order to determine the opinion, attitude, perception, preferences of people. It is also a method of data collection using questionnaires or interviews to collect data from a sample that has been selected to be a representative of the population to which the findings of the data analysis can be generalized. While the qualitative analysis employed in this study is Interpretive Phenomenology Analysis research design (IPA) using an in-depth interview schedule and focus group discussion (FGD). Phenomenological research is a qualitative research approach that seeks to understand and describe the universal essence of a phenomenon. Interpretive Phenomenological Analysis (IPA) is a qualitative research methodology that explores how individuals make sense of their experiences (Delve and Limpaecher, 2023)). Which suffice that IPA is an experiential methodology that focuses on how people make sense of what happens to them. This makes it particularly useful in fields such as psychology, sociology, and healthcare where understanding an individual's lived experience is the ultimate goal (Delve and Limpaecher, 2023)) The approach investigates the everyday experiences of human beings while suspending the researchers' preconceived assumptions about the phenomenon. In other words, phenomenological research studies lived experiences to gain deeper insights into how people understand those experience (Delve and Limpaecher, 2023) According to (Delve and Limpaecher, 2023) researchers using phenomenological research design assume that people use a universal structure or essence to make sense of their experience. They interpret the participants' feelings, perceptions, and beliefs to clarify the essence of the phenomenon under investigation. Phenomenological research design requires the researcher to bracket whatever a priori assumption they have about the experience or phenomenon.

Area of the Study

The study was conducted at the mechanical village also known as the industrial site where there are concentrations of workshops and at several locations, such as University Road, Catherine rest house road, Isi Uja, Barracks, Odenigbo, Onuiyi link road and Beach junction along Obollo road where there is equally concentration of roadside mechanic workshops in Nsukka, Enugu. Nigeria. Nsukka metropolis is situated in the coordinates 6051'24' N and $7^{0}23^{'}45^{'}$ E with a total area of 2,141.08 Sq mi (5,545.38 Km^2) and a population of 309,633(NPC,2006). Nsukka town share common boundaries with Edem, Opi, Ede-Oballa, Obollo-afor, and Obimo (NIPOST,2009). Nsukka is University town that is home to the prestigious University of Nigeria, a modern

market and several other striving businesses scattered around the town and also with some Federal presence with its parastals and agencies. Nsukka is a fast growing economically viable town contributing to the growth of the Enugu state and Nigeria as a whole.

Population of the Study

The data drawn upon for this study was gathered through questionnaire on 63 roadside mechanics officially registered with NATA, the controlling body/association of all motor vehicle repair mechanic in Nsukka. The population comprised both at the mechanic village where their concentration of workshops and from both scattered around the locations previously mentioned above in the area of the study. The population for the study also comprised government agencies from the federal ministry of labour and productivity and the national directorate of employment (NDE) they are 25 from both sectors. No sampling was done. All the populations were used for the study.

Instrument for Data Collection

Two sets of instruments were used for the study. One was the questionnaire with items generated form an extensive literature search to answer the research questions number 1 and 2 by the roadside mechanic who happen to be the master crafts men and the owner of the workshops. The questionnaire was divided in to two parts, Part I was design to find out the demographic information of the mast crafts men, level of education, if training had been received before and of what kind etc. while the part II was subdivided into sections A and B in line with research question 1 and 2. An in-depth interview schedule was develop with focus group discussion guide (FGD) which was answered by selected few based on the years of experience of the master crafts men, the staff of the ministry of labour and productivity and staff of the national directorate of employment. The FGD was conducted on the selected master craft men on previous visit to elicit information on the years of experience on the job before the FGD in their respective workshops while the FGD was conducted on the staff of the ministry of labour and productivity and national directorate of employment in their respective offices. A portion of the in-depth interview was devoted to discussing the backgrounds and demographics of the staff of the ministry of labour and productivity and national directorate of employment. Items were created to elicit data on the procedures that can be employed for the lifelong learning and education as needed by motor vehicle mechanic on the service and maintenance of modern motor vehicle and the ways government policies could be fashioned towards evolving sustainable lifelong learning and education for the informal roadside motor vehicle mechanic artisans. An informed consent was obtained before the commencement of the interview.

Method of Data Collection

The questionnaire was administered on the roadside mechanic master crafts men with the assistance of three research assistance, portion of the questionnaire items which the master crafts men could not attempt on their own was interpreted to them by the research assistance and the opinion were recorded against the relevant option of their choice. The FGD was conducted on the respondent and their responses were recorded using a tape recorder and some field notes were taken which was further transcribed.

Method of Data Analysis

Frequency counts, percentages, mean and standard deviation were used to analyse the quantitative data on research questions 1 and 2 obtained from the fieldwork using the computer

package of SPSS while the qualitative data on research question number 3 and 4 the collected data was analyzed using the Delve qualitative data analysis tool (Delve and Limpaecher, 2023) to quickly and rigorously analyze the qualitative data and then export the data into spreadsheets to analyzed it along with the quantitative data. Delve is qualitative data analysis software. It's a simple to use, collaborative online qualitative analysis tool that allows you to find rigorous, human insights quickly. Delve is an online qualitative research software that allows one to stay organized and analyze qualitative data efficiently when completing your dissertation or other research (Delve and Limpaecher, 2023).

RESULTS ON THE QUANTITATIVE ANALYSIS

The results for this study are presented according to the headings that correspond to the research questions as indicated below:

1. What are the training needs of the roadside mechanics artisans in the informal sector in the service and maintenance of modern motor vehicle for lifelong learning and education for sustainability?

Table 1: Mean scores responses master craftsmen on the training needs of the roadside mechanics artisans in the informal sector in the service and maintenance of modern motor vehicle for lifelong learning and education for sustainability)

S/n	Items	Mean	Rmks
1.	Knowledge and skills required in the operations of on-board diagnostics (OBD II) vehicles' engines diagnosis.	3.00	Agree
2	Knowledge and skills required in troubleshooting issues relating to the operations of sensors and actuators.	3.51	Agree
3	Identification and location of all the sensors and responding actuators on the motor vehicle	3.69	Agree
4	Skills required in locations and types of the various sensors in motor vehicle engine systems.	2.90	Agree
5	Knowledge, skill and ability to use a scanner or other hand-held diagnostic tools	3.01	Agree
6	Ability to read and interpret efficiently the digital trouble codes (DTC)	3.50	Agree
7	Knowledge, skills, ability to use an engine analyzer and be able to interpret the data displayed on the screen.	3.00	Agree
8	Knowledge about power train, body, chassis and control electronics technology in motor vehicle.	3.22	Agree
9	Knowledge and ability to effectively interpret the information / symbols displayed on the vehicle dashboard.	3.33	Agree
10	Ability to carry out repairs on repairs on Anti-lock braking systems (ABS)	3.45	Agree
11	Knowledge, skill and ability to effectively to perform operations and repairs on double overhead cam (DOHC)	3.02	Agree
12	Knowledge, skills and ability to carry out repairs effectively on a faulty variable valve timing intelligence (VVTi)	3.33	Agree
13	Knowledge, skill and ability to carry out repairs effectively on continuously variable transmission (CVT)	3.49	Agree
14	Knowledge, skill and ability to carry out repairs effectively on electronic fuel injection (EFI) systems	3.55	Agree
15	Knowledge, skills and ability to carry out repairs on the traction control systems	3.47	Agree
16	Knowledge, skills and ability to troubleshoot, operations and repairs on the Power- train control module (PCM) or the Engine control unit (ECU).	3.59	Agree
17	Knowledge and skill about automatic transmission and transaxle diagnosis and in-service vehicle.	3.67	Agree

18	Knowledge and skill on continuous variable transmission systems (CVT)	3.48	Agree

Table 1 revealed that all the 18 items had their means ranged from 3.00-3.67 and were above the cutoff point of 2.50 on a four-point rating scale. This revealed that the respondents (Mastercrafts-man) agreed that all the 18 items might affect the different complexity areas, component, systems and sub-systems of the modern motor vehicle where the motor vehicle mechanic requires competence in the maintenance, repairs and service of modern motor vehicles for sustainability of their service workshops.

2. What are the training needs of the roadside mechanics artisans in the informal sector in the service and maintenance of modern motor vehicle for lifelong learning and education for sustainability?

Table 2: Mean scores responses of master craftsman training need as roadside mechanics artisans in the informal sector in the service and maintenance of modern motor vehicle for lifelong learning and education for sustainability (N=63)

S/N	Item	Mean	Rmk
1	Organizing training workshops for the motor vehicle mechanic based on the innovative technologies in modern motor vehicle.	3.56	Agree
2	Arranging training programmes in modules based on the identified areas of need and use the developed training module in training the motor vehicle mechanic	3.44	Agree
3	Empowering the National Directorate on Employment (NDE) towards skill training in the identified areas of need of the motor vehicle mechanic by developing training module.	3.66	Agree
4	Through Public-private partnership (PPP). The association of motor vehicle mechanic (NATA) partnering with automobile manufacturing company in the private sector by providing training update on the latest technologies to the motor vehicle mechanics.	3.25	Agree
5	The motor vehicle mechanic can avail themselves the opportunity of identifying with an automobile training centre close them for necessary regular skill updates on the identified areas of needs	3.22	Agree
6	Consulting with a more experienced and versatile motor vehicle mechanic who has undergone training on the innovations in motor vehicle for assistance and necessary skill updates.	3.14	Agree
7	Ministry of Labour and productivity and the Central Bank of Nigeria through their small and medium scale enterprises (SME) partnering with the association of motor vehicle mechanics in providing training that will involve lifelong training and education and also incentives for the motor vehicle mechanic.	3.27	Agree
8	Allowing the informally trained motor vehicle mechanic assess to fund without collateral to enable them acquire workshops space and modern service tools for repair work.	3.33	Agree
9	Regular access to training opportunities and frequent outlets where the motor vehicle mechanic could be trained and improve their level of skill.	3.48	Agree
10	Government should step into the informally trained motor vehicle mechanic by granting soft loans through the SMEs to enable them equip the service workshop	3.57	Agree
11	The motor vehicle mechanic should be motivated to attend automotive training institute closer to them through the Industrial Training Fund (ITF) for skill updates that will include lifelong training and education.	3.12	Agree
12	Government and local authorities or other agencies involved in the issue of acquisition of land/ workshop space should step in for the motor vehicle mechanic in land acquisition.	3.51	Agree

13	The motor vehicle mechanics can all come together to form an association in form of cooperative society that will be formidable to enable them have access to fund .and for their voice to be heard.	3.21	Agree
14	Government and relevant agencies or whoever have the mandate to make serious effort in developing a unified standard training curriculum comprising lifelong training and education in line with the innovations in motor vehicle technology for training and re training as against the training received informally.	3.14	Agree

Table 2 revealed that all the 14 items had their means ranged from 3.12-3.66 and were above the cutoff point of 2.50 on a four-point rating scale. This revealed that the respondents (Master crafts-man) agreed that all the 14 items training needs of the roadside mechanics artisans in the informal sector in the service and maintenance of modern motor vehicle for lifelong learning and education for sustainability of their workshop and for effective competence in the service of modern motor vehicle.

RESULTS ON THE QUALITATIVE ANALYSIS

The respondents for the quantitative analysis comprised staff of the NDE and Ministry of Labour and Productivity. The instrument for data collection for this section in an in-depth interview and Focus group discussion (FGD) by key informant from the two parastatals. The research design employed is Interpretive Phenomenological Analysis (IPA) which has been used to explore the ways in which individuals construct their social identities and how these identities are shaped by broader cultural and social contexts (Delve and Limpaecher, 2023). It is also a qualitative research methodology that explores how individuals make sense of their experiences. IPA can also mean an experiential methodology that focuses on how people make sense of what happens to them. This makes it particularly useful in fields such as psychology, sociology, and healthcare where understanding an individual's lived experience is the ultimate goal (Delve and Limpaecher, 2023). There are 25 participants from the two agency who were interviewed and their responses were recorded and transcribed based on the research questions

3. What are the procedures for the lifelong learning and education as needed by motor vehicle mechanic on the service and maintenance of modern motor vehicle?

The participants from both agencies views and responses were reported below;

One of the participants from the NDE proposed the National Vocational Qualifications Framework (NVQF) and which some other staff corroborates with;

> "*Which is a system for the development, classification, and acknowledgement of the information, skills, and competencies that individuals have gained, regardless of the location or method of instruction. Whether the learning took place in a formal setting such as a classroom or an informal setting such as on-the-job training, the system provides a clear explanation of what the learner must know or be able to perform. The framework shows how different certifications can be compared and how one might advance from one level to another. He added that the NVQF will offer explanations of the required occupational skills and a standard skill level grid for all qualifications included in the framework. The NVQF's primary goal is to offer standards that will improve quality, accountability, transparency, access, progression, and comparability of qualifications in relation to the labour*

market needs as outline in the national policy of education" as stated by Okorie (not real name).

With the increasing nature of the globalization of science and technology, there are many car owners today in the society and the main problem that arises is that of repairs and maintenance. There is therefore need to apply appropriate cognitive strategies that will be used in learning the motor mechanic skills (Clark & Graves, 2005). One of the participants examines the following cognitive strategies; diagnostic strategies, problem solving strategies, practical strategies, interpersonal and that will be used in the learning of motor mechanics and other related trade areas such as Panel biting/bodyworks, electric work, general maintenance and engine repairs) Different strategies may have different characteristics in terms of their time and space complexity, memory requirements, etc. and therefore in terms of their error characteristics.

"Asogwa (not real name), one of the participants noted this these many cognitive techniques can be used for acquiring various abilities. Cognitive methods are practical aids for helping pupils who struggle with learning. In its most basic sense, the word "cognitive strategies" refers to the use of the mind (cognition) to resolve a dilemma or finish a task. Engine Sound Another name for cognitive techniques is procedural facilitators. The term "diagnostic strategies" refers to a person's capacity to recognise and define a certain issue"

When a customer brings in their car for a repair, motor mechanics are often stressed and overwhelmed. A great technician acknowledges this and is able to find the source of the problem quickly and efficiently. Once they've diagnosed the vehicle, they use their mechanical and electrical skills to complete the repair and get the vehicle back up and running. Another participant suggested problem- solving strategy; in his statement he said,

"A mechanical problem-solving approach involves applying standard techniques and tools in a systematic way in order to identify and rectify faults and providing solutions to problems. The day-to-day work of a technician will inevitably involve issues, as with any career. This calls for quick thinking and problem-solving skills. A technician's goal is to find a solution that is best for the customer and the motor vehicle mechanic service shop, whether a repair is taking longer than anticipated or a customer is dissatisfied with their car." 'Adeoye'

Adeyi mentioned technical strategy a procedure for the lifelong learning and education as needed by motor vehicle mechanic on the service and maintenance of modern motor vehicle;

"Technical strategies are the skills and information required to carry out particular jobs. They are useful and frequently relate to duties in the fields of science, mathematics, computer technology, or mechanical engineering. He added that technical skills are knowledge and abilities that are unique to a given occupation or group of vocations. Technical skills are hard skills involved with the use of tools, equipment related to work properly and efficiently, as well as all technical matters. Technical expertise in this study refers to the capacity to expertly repair, service, and maintain engine components in line with established standards or manufacturer instructions."

One of the participants name Okafor also noted that interpersonal skill is adequately necessary for lifelong learning and education among the mechanics: Interpersonal skills range from communication and listening to attitude and deportment.\

> *"Okafor claims that a mechanic must possess the following interpersonal skills: good customer service relation, follow up on the rectified fault and so on in dealing with clients. One may only work as a mechanic for as long as people are willing to bring their cars in for maintenance and repairs. So, engaging with clients frequently will be necessary if you want to succeed in your career.*

Oluwatoyin, one of the participants mentioned Heutagogy as a strategy or a procedure for the lifelong learning and education as needed by motor vehicle mechanic on the service and maintenance of modern motor vehicle'

> *"Oluwatouin believe that Heutagogy, is the teaching of oneself. The main goal of this learner-centered, all-encompassing, future-focused learning is for the mechanic to learn how to learn or gain "lifelong learning" abilities through independent, proactive, and active learning processes. It emphasises mechanics' autonomy and encourages learners' active participation in the formation of new knowledge in authentic contexts, leading to a learning process where the mechanic is crucial to the development of contents and contexts. Heutagogy is a form of self-education that was developed in response to the frustration with the way teaching-learning monopolised education. The goal of this self-discovery learning process is to transform the traditional "teaching-learning" process into a "learning/teaching" approach. Heutagogy is a system of learning that is focused on the learner. It holds that mechanics must be committed to dictating, initiating, and directing the learning process in their chosen field of motor vehicle mechanic repair work for education to achieve its intended goals, especially for mechanics."*

On what are the ways government policies could be fashioned towards evolving sustainable lifelong learning and education for the informal roadside motor vehicle mechanic artisans? key informant interviews and focal group discussion) and policy document analysis, the following are the stakeholders' views:

1. reduce the age limit of imported used automobiles from eight to 10-20 years;
2. reduce the tariffs and port charges for importation of spare parts;
3. local component parts manufacturers should be monitored over maintenance of set standard; there should be automobile component test centre, an independent centre for certifying parts made locally; since Assembly Plants refuse to patronize them on the excuse of low standard;
4. imported spare parts should be inspected and its quality established before they leave the ports of exporting countries. These ports should also be tested at the Automobile component test centre. Countries found to collaborating with dubious businessmen should be sanctioned;
5. provision of a steady re-training programme;
6. establishment of a central fault diagnosis centre within the mechanic villages;
7. organized linkage with non-formal training agencies like IDC, ITF and NDE;

8. provision of public utilities especially electricity and permanent physical structures in the mechanic villages;
9. re-introducing UNDP programmes for up-grading their skills; more so as they pay stipends to participants
10. Provision of access for fund and financial capacity

DISCUSSION OF FINDINGS

The study's findings, which are presented in Table 1, showed that each of the 18 items was a different area, component, system, or subsystem of a modern motor vehicle, about which a mechanic must remain knowledgeable throughout their career to be proficient in maintaining, repairing, and servicing such vehicles and to ensure the viability of their service shops given the complexity of modern motor vehicles. All items had high average responses that were significantly higher than the cutoff of 2.50. These include the expertise and abilities necessary for using on-board diagnostics (OBD II) to diagnose a vehicle's engine. the expertise and abilities needed to identify and resolve problems with sensors and actuators, Having the knowledge, expertise, and ability to efficiently conduct double overhead cam (DOHC) operations and repairs Ability to successfully fix a malfunctioning variable valve timing intelligence (VVTi), knowledge, and abilities. the capacity to efficiently read and interpret digital trouble codes (DTC), Ability to properly perform repairs on continuously variable transmissions (CVT) by knowledge, skill, and ability. These findings are in substantial agreement with Ogwo (2010) who had earlier stated that due to the sophistication of vehicles imported from North America to Nigeria popularly known as "Tokunbo" has made the job of the master craftsman in the informal sector motor vehicle repair more difficult. The results are also consistent with those of a study by Njagi Njeru and Mugi (2018) titled "Skills and Competency Gaps Analysis of Motor Mechanics in the Informal Sector: A Case Study for Meru Township in Kenya," which found that the training facilities provided by training institutions do not adequately prepare students for the demands of the labour market. As long as the Competency Bases Education and Training (CBET) framework, lifelong learning, and is tailored to explicitly address the special demands of the informal sector, it may close any gaps (Oparaugo,2003).

According to Oparaugo (2003), the difficulties faced by roadside motor vehicle mechanics have gotten worse as the technology required to diagnose, repair, and maintain modern vehicles advances. This is because the skill set of trial and error alone is insufficient for the best diagnosis, repair, and maintenance of OBD II enabled vehicles, i.e., vehicles that incorporate the OBD II system and require computer based-software to enable interaction between the vehicle and the roadside motor vehicle mechanic. Once again, this circumstance represents the "state of the art" in terms of roadside motor vehicle mechanics and vehicle diagnosis.

Since the establishment of this democratic government, Olaitan and Ede (2010) noted that there has been an unprecedented influx of fairly used imported vehicles known as "Tokunbo" into the nation. This has placed a heavy demand on the quality of service expected from the skilled auto mechanic master craftsmen in Nigeria. According to Ogwo (2007), the more advanced cars get in North America, Europe, and Japan, the harder it is to maintain those exported to developing nations, leaving the informal motor vehicle mechanic with the difficult task of maintaining cutting-edge technology in contemporary cars.

The information in table 2 showed that all 14 of the items were related to lifelong learning and education, which is how a mechanic for modern cars can get training and raise their level of

proficiency in maintaining, repairing, and servicing them based on the identified areas of need that capacity is necessary for. All items had high average responses that were significantly higher than the cutoff of 2.50. The government and relevant agencies, or whoever has the mandate, should make serious effort to develop a unified standard training curriculum in line with the advancements in motor vehicle technology for training. Other examples include organising training workshops for the motor vehicle mechanic based on their identified areas of need for training and re training as against the training received informally. Ministry of Labour and productivity and the Central Bank of Nigeria through their small and medium scale enterprises (SME) partnering with the association of motor vehicle mechanics in providing training and incentives for the motor vehicle mechanic among others.

These results are in line with those of Ekpo and Umoh (2012), who believe that transformation that is created and sustained over time from within is a necessary component in growing capacity. Transformation of this kind extends beyond executing tasks to change mindsets and attitudes. Similar to this, according to Di Pierro et al (2021), actions for capacity building need to be done that are focused and specialised. Conferences/workshops, individual training programmes, business development activities, workshops for in-depth discussion of specific skill training, institutional development of internal policies, organisational and procedural restructuring, and systemic advocacy initiatives, consultations, open dialogue, and reforms are all examples of potential capacity building initiatives.

About the study's qualitative component, the participants endorsed the practises for motor vehicle mechanics' ongoing education and training about the upkeep and repair of modern motor vehicles. Through in-depth interviews with key informants for focus group discussions, government policies could be developed to promote sustainable lifelong learning and education for informal roadside motor vehicle mechanic craftsmen. There are many car owners in society today as a result of the growing globalisation of science and technology, and the major issue that arises is that of repairs and maintenance. There is therefore need to apply appropriate cognitive strategies that will be used in learning the motor mechanic skills (Clark & Graves, 2005). The following cognitive strategies are therefore examined in this paper: interpersonal, practical, problem-solving, diagnostic, and those that will be employed in the learning of motor mechanics (Panel biting/bodyworks, electric work, general maintenance, and engine repairs). The time and space complexity, memory requirements, etc. of various methods may vary, as well as the error characteristics of those strategies. These many cognitive techniques can be used for acquiring various abilities. In order to help pupils with learning difficulties, cognitive techniques are effective tools.

In its most basic sense, the word "cognitive strategies" refers to the use of the mind (cognition) to resolve a dilemma or finish a task. The term "procedural facilitators" can also be used to describe cognitive techniques. Vehicle Sound A person's capacity to recognise and define a certain issue is referred to as their diagnostic techniques (Swamidass, 2000). Through formal instruction, practise, and experimenting, these abilities are developed. Motor mechanics are frequently under pressure and overburdened when a customer brings their car in for repairs. An excellent technician understands this and can swiftly and effectively identify the issue's root cause.

After diagnosing the vehicle, they repair it and get it working again by utilising their mechanical and electrical expertise. Mechanical problem-solving techniques involve employing standard techniques and tools in a systematic way to find solutions to difficulties. The day-to-day work of

a technician will unavoidably involve challenges, just like in any career (Swamidass, 2000). This calls for quick thinking and problem-solving skills. The role of a technician is to find a solution that is best for the customer and the service shop, whether a repair is taking longer than anticipated or a customer is dissatisfied with their car.

Technical strategies are the skills and information required to carry out particular jobs. They are practical and frequently involved in mathematical, scientific, information technology, or mechanical work (Ferry, 2012). Technical skills, according to Medina (2011), are hard skills connected to using tools, equipment necessary for work to be done properly and efficiently, as well as all technical topics.

Technical skills, in the opinion of Abinu (quoted in Agada, 2014), are the knowledge and abilities particular to a given occupation or range of occupations. Technical expertise in this study refers to the capacity to expertly repair, service, and maintain engine components in line with established standards or manufacturer instructions. The actions and techniques a person employ to communicate with others successfully are known as interpersonal strategies (Gullick, 2015). The phrase describes a worker's capacity to collaborate effectively with others in the business sector. Communication and listening are two examples of interpersonal skills, as are attitude and demeanour. Ferry (2013) asserts that a mechanic must possess the following interpersonal skills: dealing with clients. One can only work as a mechanic for so long as one has customers will to bring their vehicles for repairs and maintenance.

Self-teaching is referred to as heautagogy. The main goal of this learner-centered, all-encompassing, future-focused learning is for the student to learn how to learn or acquire "lifelong learning" abilities through independent, proactive, and active learning processes. It emphasises the autonomy of the learner and promotes their active participation in real situations for the creation of new information, resulting in a learning process where the learner is key to the creation of contents and contexts (Hase, 2011, Blaschke, 2012). The frustration with the monopolisation of education by a process gave rise to heutagogy, a form of self-education known as teaching-learning. The goal of this self-discovery learning method is to transform the traditional "teaching-learning" process into a "learning teaching" approach. Heutagogy is a system of learning that is focused on the learner. In its opinion, students must be committed to dictating, initiating, and guiding the learning process in their chosen field of study—in this case, motor vehicle mechanic work—for education to achieve its worthwhile goals, particularly for learners (Blaschke, 2012).

CONCLUSION

Training becomes imperative for the informal automobile sector because of its increasing sensitivity to technology transfer and innovations in automobile technology from automobiles imported from North America, Europe and Japan which has consequently facilitate the assimilation and adaptation of technology. Some of these components, systems and sub-systems are new to the informally trained motor vehicle mechanic for the maintenance, repairs and services of modern motor vehicles which suffice the need for lifelong learning and education in modern motor vehicle system for sustaining service workshops.

Hence there's need by the stakeholders to find a means of integrating lifelong learning and educational initiatives into the activities of the master craftsmen, journey men and the apprentices in the informal sector motor vehicle mechanic in maintenance and repair work towards improving effective service delivery so that the informal motor vehicle mechanic

performing operations in the maintenance and repair work can be sustainable. Again, the master craftsman should be encouraged to embark and participate in training on new technologies to enable him to impart and transfer the new knowledge learnt to his apprentices.

The primary goal of the study was to identify the factors that influence roadside mechanics in the informal sector's need for lifelong learning opportunities and training in the maintenance and repairs of contemporary motor vehicles for sustainability. The specific research questions were to determine the training needs of roadside mechanics artisans in the informal sector in the service and maintenance of modern motor vehicles, determine the methods by which the roadside motor vehicle mechanic artisans can obtain the training they require for lifelong learning and education for sustainability, and determine the processes for the lifelong learning and education for sustainability, find out are the modalities for which the training needs can be obtained by the roadside motor vehicle mechanic artisans for lifelong learning and education for sustainability, find out the procedures for the lifelong learning and education as needed by motor vehicle mechanic on the service and maintenance of modern motor vehicle, and find out the ways government policies could be fashioned towards evolving sustainable lifelong learning and education for the informal roadside motor vehicle mechanic artisans . Considering the findings of this study, it can be concluded that, for lifelong learning and education of the motor vehicle mechanic include; problem-solving strategy is required, interpersonal skill/ strategy is equally required, technical skill and diagnostic strategies is highly required, Heautologogy strategy is also required. National Vocational qualification framework as specified in the national policy on education should be implemented.

The results of this study have important ramifications for the automobile industry, notably for the informal sub-sector of the motor vehicle mechanic artisan. Making provisions for their training, continued professional development, and lifelong learning and education programmes could improve the efforts of motor vehicle mechanics working in the informal sector to fabricate replacement components. There are numerous ways to facilitate their training, including reorienting existing technical colleges to adapt their modular curriculum to suit the less educated motor vehicle mechanic artisans, networking the skilled mechanics through their association (NATA) and through (NAC) in establishing regular internal knowledge exchanges between the mechanics themselves (Ogwo and Ede, 2011). Other initiatives include working with the ILO/UNDP and non-governmental organisations to offer specialised skill-development programmes for master craftsmen and journeymen. The National Board for Technical Education (NBTE), National Business and Technical Examination Board (NABTEB), Ministry of Education, Ministry of labour and productivity, Industrial Development Centre (IDC), Industrial Training Fund (ITF), and NATA and NAC should be responsible for developing training policies and educational programmes for mechanics working in the unofficial sector (Ogwo and Ede, 2011). Furthermore, rather than relying solely on the master craftsman's granted certification about the duration of training, proper certification of apprentices based on gained skills by NATA officials, the National Automotive Council (NAC), and pertinent agencies have to be pursued. The rates charged for training across three to five years in the informal sector are a pitiful number in comparison to the term-based tuition fees at public and private schools. Through the National Poverty Education Programme (NAPEP), the government could give master craftsmen the authority to accept additional trainees while ensuring that they all benefited from the lifelong training and education. This is especially important given that older workers outnumber younger ones, more graduates of higher education are having trouble finding work in the formal sector, and more master craftsmen need to up skilling in motor vehicle mechanic work, according to the study's findings. Youth unrest may be resolved

more effectively through skill empowerment through training than through the use of force by law enforcement. By taking such action, the government will effectively leverage the informal sector to support the formal sector (Ogwo and Ede, 2011).

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