EXPLORING THE POTENTIALS IN AUTOMOBILE TECHNOLOGY CAREER PROSPECTS FOR SUSTAINABLE DEVELOPMENT AND NATIONAL SECURITY IN NIGERIA

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Abstract
Education is a vital instrument for national development. Advancement of a nation – technologically, economically and in the area of security is hinged on the educational philosophy been practiced in such a nation. The function of education is to impact knowledge and requisite skills to live as a productive citizen in the society, hence, the need for an education such as Automobile Technology that prepares individuals with the skills needed to live,

learn and earn a decent living. The paper explored career prospects in automobile technology trade that can offer individuals with the saleable skills needed for job creation, and also for effective employment in the world of work. When people are gainfully employed, their quality of lives will be enhanced, security challenges will reduced, and overall country's economy will improve. All these positive indices lead to national development. The paper also pointed out barriers for effective implementation of automobile technology policies, such as faulty curriculum, underestimation of practical teaching, shortage of infrastructure, among others. The paper conclude and recommended that Security of lives and properties should be handled with utmost seriousness by both individuals and government since industrialization, economic growth and national development can only come to fruition in a secure environment, also, there should be a paradigm shift of our education curriculum from a provider – driven training model to demand- driven training model where the training provided by educational institutions is aligned to an identified gap in the labour market, among others.

Keywords: *Automobile technology, Automobile Technology career prospects, Sustainable development and National Security.*

1. Introduction

Education is adjudged as a crucial tool for national development. For education to yield the needed development, it has to be functional, adequate and responsive to the needs, yarning and aspirations of the society. Ogunyemi and Olaniyan, (2023) defined education as a vital instrument for national development, aiming to foster skills, knowledge, and values that contribute to individual growth and societal advancement.

However, Automobile technology is one of the Technical and Vocational Education and Training (TVET) programmes that boarder on the techniques of maintenance, repair and operation of vehicles. According to Ojo and Lampo, (2019) Automobile technology involves the acquisition of scientific knowledge in design, selection of materials, construction, operation and maintenance of motor vehicles. Automobile technology is one of the trades offered in secondary schools, technical colleges and

other post – secondary schools education (Federal Republic of Nigeria, 2015). Automobile technology is a form of education and training that prepares individuals with the skills needed to live, learn and earn a decent living. Therefore, exploring the occupational prospects and opportunities in Automobile technology trade can provide veritable grounds for individuals to set – up his/her own workshop, even employs others and thus contributes to national development by reducing unemployment which is one of the causative factors of security challenges.

Security had taking a center stage in the public discuss both locally and international. Security implies the protection of individuals, organizations, and nations from threats and risks that could cause harm or disruption (Brown & Smith, 2024). Nigeria, no doubt had witnessed a host of security challenges in different dimensions, ranging from the activities of Herdsmen, Boko - haram insurgencies, Armed robber attacks, Kidnapping for ransom, Banditry, and a host of other crimes. Security challenges impede a country's development inform of diverting resources, discouraging investment, disrupting economic growth and destabilize social stability, and hindering progress and prosperity. Since no meaningful development can take place in an unsecure environment; hence, security is crucial to sustainable development.

Sustainable development implies the development that meets the needs of the present generation without preventing the ability of future generations to meet their own needs. According to United Nations, (2023) sustainable development is a process of growth that meets the needs of the present without compromising the ability of future generations to meet their own needs. The author stressed that sustainable development involves balancing economic growth, environmental protection, and social inclusion to ensure long-term viability and equity. However, development is a phenomenon or process that brings about growth, progress, and positive change to state or individual's physical wellbeing, economic, environmental, social, and all other positive indices of human sustenance. Development connotes absence of security challenges; hence security is very essential to national coexistence and national survival.

Therefore, there is need for an educational philosophy such as that of Automobile Technology that encourages skill acquisition and job – creation via the occupational prospects available in the trade area. Evidences from literatures revealed that breakdown of security is being perpetrated by youth due to idleness, so, Automobile technology is capable of providing the youth with the skills,

techniques, knowledge and attitude needed for effective employment in the world of work. When people are gainfully employed, their standards of living will improve, the rate of insecurity will reduce, and the overall country's economy will be enhanced. All these are the ingredients of sustainable national development.

2. Literature Review

2.1 Automobile Technology Education

Automobile Technology Education refers to the process of acquiring knowledge and skills related to the design, manufacturing, maintenance and repair and operation of vehicles. According to Oke and Bello, (2024) automobile technology involves the study and application of vehicle systems and repair techniques tailored to local conditions. It focuses on improving vehicle performance, maintenance practices, and adaptation of automotive technologies to suit Nigeria's diverse road environments and economic need. The National Policy on Education Revised edition (2015) describes Automobile Technology Education as that aspect of Technology education that is intended to provide among other things opportunities for immediate employment for the youths in the area of skill acquisition in vehicle repair and maintenance.

Furthermore, The Minimum Standard for Nigeria Certificate in Education, (N.C.E.) (Technical) by the National Commission for Colleges of Education (N.C.C.E.) revised edition (2020) describes the philosophy of Automobile Technology Education (A.T.E.) as a programme that boarders on improving the lives of the individuals and the society in general. However, some of the objectives of Automobile Technology Education adapted from general TVET objectives include:

a. to give training and impart necessary skills leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self-reliant.
b. to provide trained manpower in the applied science, technology and commerce particularly at sub-professional grade.
c. to enable young men and women to have an intelligent understanding of the increasing complexity of technology.

A careful look at the objectives of Automobile Technology as expatiated above revealed that the programme is based on skills and competencies for job creation. Idle hands they say is devils' play grounds. Automobile technology skills can assist

individuals to earn a decent living by creating a means of livelihood that will improve individuals' standard of living, curbs security challenges and thereby contributing to national development.

National Security

Security means different things to different people and in different places – at home it could means domestic security, in the place of work, it is referred to as job security and at national level when it has to do with protection and preservation of nation's sovereignty, territorial integrity and the citizen's well – being, it could be called national security. Security, according to Adeyemi and Bello, (2024) refers to the measures and strategies implemented to protect individuals, communities, and national assets from threats such as terrorism, crime, and civil unrest. Gubak and Bulus, (2018) maintained that security is related to the presence of peace, safety, happiness and the protection of lives and property or the absence of crisis, threats to human survival, among others. Security is one of the important indicators for national coexistence and national survival hence, the need for Automobile technology education that encourages skill acquisition for productivity and self-reliance. When people are gainfully employed, their standards of living will improve, the rate of insecurity will reduce, and the overall country's economy will be enhanced.

National Development

National development is a very controversial concept that had suffered definition pluralism. According to United Nations Development Programme (2021), national development implies the sustained, concerted actions of policy- makers and communities that promote the standard of living and economic health of a specific area with the ultimate goal of improving the overall quality of life of its residents. Lasisi, et al. (2022) opined that national development is any positive change which brings about desirable benefits to the individual and society. Perhaps, at the individual level, development may means growth in knowledge, skills, attitudes and enhanced ability to survive. At the society level, development is associated with modernization, material advancement, industrialization, scientific and industrial progress, new knowledge about man and the universal improvement in standard of living, decrease in loss of lives and social security management towards racial, tribal and gender equality, decrease in unemployment and availability of job opportunities. Therefore, to enhance national development, career opportunities in Automobile technology has enormous potentials for job creation, improving

quality of life, reduce poverty and limiting the incidence of security challenges due to joblessness.

Automobile Technology Career Prospects for National Development

Automobile is a composite of many complex systems. According to Valasek, (2018), Automobile technology is a multidisciplinary field of study that impacts knowledge about the design, operation and maintenance of automobiles, including the integration of cutting-edge technologies such as electric and hybrid propulsion and autonomous systems. Automotive field offers almost unlimited career opportunities for individuals to engage themselves, earn a living, be useful to themselves and people around them, and the society at large. In fact, many service managers, dealers and independents garage owners were once automotive mechanics. Valasek, (2018) observed that the renowned names (Henry Ford, Walter Chrysler, Ransom Olds, among others) in automotive industries all began as automotive mechanics. However, some of the automotive career options include:

a. Automotive Repair Shop: Automotive repair shops are independent garages. Some are one person specialty, while others may be general repairs shops that employ many master automotive technicians. Automotive Service Excellence (ASE) (2023) recognizes the following services specialties: Engine Repair, Automatic Transmission/Transaxle, Manual Drive Train and Axles, Electrical/Electronic System, Suspension and Steering system specialist, Braking system, Heating and Air conditioning, Engine performance and Light vehicles/Diesel engines. According to ASE, (2023), other automotive specialty include:

i. Wheel balancing and alignment.
ii. Tire vulcanizing and repairs.
iii. Battery charging.
iv. Clutch and gearbox repairs.
v. Carwash and engine servicing.



Fig. i: Auto dealer's service and repair facility, Rockville, Maryland, USA, - internet sourced data (2023)



Fig. ii: Auto repair service garage, Ukraine – internet sourced data (2023)



Fig. iii: Wheel balancing and alignment shop – Internet sourced data (2023)

b. Auto Parts Store: This is another automotive career option. An automotive parts store may operate both as a wholesaler and as a retailer. As a wholesaler, the store sells auto parts and related accessories at a discount to other automotive service businesses, while a retailer part store sells parts at non-discounted rate to people who service their own vehicle.



Fig. iv: Interior of an Advance Auto Parts store in Virginia, United States - Internet sourced data (2023)

c. Service Station: Automotive career also include the service station operation. The function of service station is to carry-out vehicles repair and maintenance job, and also to sell automotive fuels. Although, today, most service stations sells only fuel, oil and other automotive fluids without engaging in any repair and maintenance work.



Fig. v: Samimootor, a car repair shop and filling station in Nuorgam, Utsjoki, Finland – Internet source data (2023)

d. Fleet shop: An automotive fleet shop refers to a repair shop that is dedicated to repairing and maintaining a collection of vehicles often owned by a single organization or company. Examples of this include; FUTMIN vehicles, Chanchaga red bricks vehicle, logistics and delivery vehicles, among others, and collection of other vehicles that belong to a single establishment.

e. Engine machine shop: This is an engine machine shop that is dedicated to the repair, modification, and rebuilding of internal combustion engine parts. These workshops utilize large electromechanical machines that are not found in the average automotive repair shops. The tasks performed by engine machine shop include: engine block machining, crankshaft grinding, cylinder head work, balancing of engine parts, among others.

f. Auto Service Adviser: The job of an auto service advisor is to welcome the customers and writes repair orders based on symptoms described by the car owner. Auto Service/repair writers often generally have a sound background in troubleshooting and diagnosis.

Apart from the auto occupational careers mentioned thereof, National Automotive Technician Education Foundation (NATEF), (2019) also pointed-out other career opportunities in automobile technology field, include:
i. Automotive technology instructors
ii. Curriculum developers
iii. Technical trainer educators
iv. On – line course instructors
v. Programme coordinators/managers, among others.
Therefore, exploring any of the career prospects highlighted and discussed above is capable of enhancing an individual's standard of living; tackles security challenges and encourages the national development campaign agenda by the government.

Barriers to Effective Implementation of Automobile Technology Education Policies in Nigeria

Despite the significant role of TVET in the areas of human resource development for productivity in Nigeria, little progress had been made due to a number of

problems which have continued to bedeviling the programme. Uwaifo, (2015) identified the following among others as some of the challenges of Automotive technology policy implementation in Nigeria. These challenges are as follows:

a. Under - estimation of practical teaching

Technical and Vocational Education and Training programme of which Automobile technology is an aspect is targeted at cultivating the habit of practical application of skills by students. Technical and Vocational Education and Training (TVET) schools should therefore place extra emphasis on basic competences and skills required for practice in TVET fields as their major focus. However, due to influence of traditional education for quite a long time, TVET schools still followed the traditional education mode which at times de-emphasis experiment and practice. For instance, experiment and practical courses are not qualitatively distinguished from courses of knowledge impartation, teachers just echo what the books say, students copy notes, and experiments and practical courses become courses of an armchair strategist. In terms of teaching content, theory is overemphasized, while practical training is down – played.

b. Lack of regular training and re-training opportunities for the teachers

Teachers remain the most important resource in any educational enterprise; therefore, they need to continue to update their knowledge since the world is dynamic. Many TVET teachers still practice the traditional chalk and board method of delivering instruction in the class. Regular training will therefore keep teachers updated with the latest educational practices, teaching pedagogies and advancements in automotive trade. All these will assist them (teachers) to stay current and relevant in their field.

c. Financial constraints

While general education programmes, for instance, humanity, may only require buildings for lecture halls, Automobile technology programme require in addition, the buildings and equipment for special laboratories and workshops. All these cost a large sum of money of which the Federal and State governments appear unable to meet adequately in view of other pressing national and economic priorities.

d. Poor electricity supply

Epileptic power generation and supply is another factor that has hindered the implementation of Automobile technology education policies in Nigeria. Most schools find it difficult to conduct practical as most machines are electrically operated. Most companies and industries had folded up due to incessant power failure. With the current removal of fuel subsidy, private firms that provide schools-industries linkages to our students have gradually shifted their production-base to other West African countries. All these have led to production of unskilled graduates, job- losses and reduction in the quality of lives of the citizens and as such cannot contribute to national development.

e. Faulty Curriculum

A close examination of the current Automobile technology curriculum generally reveals a lot of inadequacies, such as mismatched course contents, obsolete teaching methods and materials, outdated textbooks, grossly insufficient practical time, to mention but a few. There seems to be no emphasis anymore on the inculcation of job skills and competencies in line with the philosophy of the programme. Therefore, our education curriculum needs a paradigm shift from a provider – driven training model, where the training provided by the schools is not aligned to any identified need in the labour market, to a demand - driven training model where the learning experiences provided by the schools is tied to identified skill gaps in the labour market.

5.1 Conclusion

A country's progress and development is a function of the nature of the education model being practiced in that country because, school is seen as the mirror to the society. A country's education is dependent on the needs and aspiration of the country, therefore, for national coexistence and national survival, there is need for an educational philosophy such as that of Automobile technology that encourages skill acquisition for productivity, economic growth and self-reliance. However, the goals of Automobile technology education as enshrined in the national policy have been very difficult to achieve due to a number of challenges such as under – estimation of practical teaching, lack of regular training and retraining of technology teachers, financial constraints, among others.

Therefore, by addressing the challenges enunciated thereof, Automobile technology career prospects can offer individuals with the saleable skills,

techniques, knowledge and attitude needed for effective employment in the world of work. When people are gainfully employed, their quality of lives will be enhanced, security challenges will be ameliorated, the overall country's economy will be transformed, all these are elements of national development which can only be achieved in a secured environment.

5.2 Recommendations

In the light of the issues discussed in the paper, the following recommendations are drawn:

a. Security of lives and properties should be handled with utmost seriousness by both individuals and government since industrialization, economic growth and national development can only come to fruition in a secured environment.

b. There is need for regular training and retraining of TVET teachers as this will keep them updated with the latest educational practices, teaching pedagogies and advancements in their trade areas.

c. Automobile technology programme, being an aspect of TVET programmes is capital intensive hence; more funding should be allocated to ensure a smooth running of the programme.

d. Automobile technology programme courses should be designed to have enough practical relevancies that are required to set-up one's workshop or to secure a paid job in the industry.

e. There should be a paradigm shift of our Technology education curriculum from a provider -driven training model to demand - driven training model where the training provided by educational institutions is aligned to identified gaps in the labour market.,

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