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## **Bridging the Skills Gap among Automobile Technology Graduates in Nigeria through Innovative TVET Policies and Practices**

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### **Abstract**

*The critical role played by Technical Vocational Education and Training (TVET) in national development has long been acknowledged in providing skilled workforce required for sustainable industrial development in Nigeria. The level of skill possessed by TVET graduates, particularly, Automobile Technology Graduates (ATGs) for employment, has been a worrisome issue for employers of labour in automobile related industries in Nigeria. Despite the several formulated policies geared towards reforming TVET to addressing skills gap challenges in the country, there are yet indications of the prevalence of skills gap mostly in technical and occupational areas. In particular, most ATGs often struggle to carry out technical tasks upon employment basically due to the absence of adequate relevant skills. This is due to the grave deficiency of modern equipment, facilities and competent personnel to equip students with the right skills set to enable them fit properly into and adapt to the rapidly changing labour market demands in the 21<sup>st</sup> century workplace. Consequent upon this, the current paper identified and expounded on skills gap and elucidated on its precursor factors. Additionally, this paper critically observed and elicited innovative TVET policies and practices that can actually bridge the skills gap among ATGs in Nigeria, some of which are assembling political will to facilitate vocationalization; compulsory two-years Students' Industrial Work Experience Scheme (SIWES); need for Public-Private Partnership (PPP) among others. Some recommendations that were proffered include among others, the government of the day should look more closely into TVET to ensure existing TVET related policies are implemented through the stipulated bodies; industries, government and TVET institutions should establish robust and dynamic partnership that will enhance and deepen the skills of automobile technology students through a thoroughly monitored two-years compulsory SIWES in relevant industries to strengthen employment prospects upon graduation; and review and reformation of TVET curriculum should be carried out by the various key players to adequately reflect all-inclusiveness.*

**Keywords:** *Automobile Technology, Automobile Technology Graduates (ATGs), Technical Vocational Education and Training (TVET), Skills Gap, Innovative TVET Policies and Practices.*

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### **Introduction**

The issue of skills gap among automobile technology graduates has been a source of major concern to employers of labour in the automobile related industries in Nigeria as to whether tertiary institutions where technical and vocational programmes are offered are actually meeting the need for their

establishment. Skills gap can harm the productivity and profitability level of industries and as well inflate average labour costs (McGuinness & Ortiz, 2016). Studies have revealed that automobile firms often invest a lot of resources in organizing retraining programmes for newly employed graduates of automobile technology because the skills they possess are often inadequate to enable them

cope with the 21<sup>st</sup> century workplace demands (Rufai, Abdulkadir & Kagara, 2013; Murgor, 2017; Okwelle & Ojotule, 2018; Moldovan, 2019). Literature on skills gap have identified three broad reasons for skills gap globally, namely shortcomings in the academic system that fails to equip students with basic interpersonal and ICT skills that prepare them to quickly adapt to a work environment (Rosenberg, Heimler & Morote, 2012; Hobson, Strupeck, Griffin, Szostek & Rominger, 2014), secondly, unimplemented policies and practices (Okorafor & Nnajofofor, 2017; Oviawe, 2018), and thirdly, rapid and constant technological change (Osilon, 2015). Therefore, this paper seeks to investigate and suggest innovative TVET policies and practices that can solve the problem of skills gap among automobile technology graduates in Nigeria.

### **Automobile Technology**

Automobile technology bothers on how vehicle systems function in relation to each other to enable locomotion. As some authors consider automobile technology as technological advancements in today's automobiles, such as the On-Board Diagnostics, sensors, Advanced Driver Assistance System and autonomous driving that provides increased passenger safety, (Fleming, Allison, Yan, Stanton & Lot, 2018), others consider automobile technology as a programme run at the university level, and structured to prepare students for the 21<sup>st</sup> century workplaces in automobile related industries (Ismail & Mohammed, 2015). Mechanical/Automobile Technology as it is often called in universities in Nigeria is a sub-unit of the Department of Industrial Technical Education, offered in the Faculty of Vocational and Technical Education (National Open University of Nigeria, 2015).

The main aim of automobile technology as stated by the Federal Republic of Nigeria (FRN) (2013), is to provide high-level skilled graduates who will be facilitators of automobile education in tertiary institutions, entrepreneurs in automobile trades and or gain employment in automobile related institutions. Moreover, Bindu et al, (2017), noted that the modular arrangement of automobile technology in tertiary institutions enables easily assimilation

of learning contents and components. The authors further emphasized that quality time must be given to practical as separate from theory such that, seventy percent of the total time is dedicated to practical, while thirty percent to theory. When these are put into full practice, which will normally span across five years in universities, a high-level skilled workforce will be produced upon graduation (FRN), and they are referred to as automobile technology graduates.

### **Automobile Technology Graduates (ATGs)**

Automobile technology graduates are the bedrock of automobile related industries and educational institutions. Scholars consider ATGs as individuals who have had school and industrial-based training in the repair and maintenance of vehicle systems, including the use of computerized gadgets in diagnosing vehicle faults (Idris & Ogbuanya, 2015; Beako, 2017). In Nigeria, ATGs are outputs of Industrial Technical Education which is one of the five year courses offered in the Faculty of Vocation and Technical Education (FRN, 2004, 2013). ATGs have been exposed to rigorous trainings in technical and engineering drawings; workshop practices, teaching practices and a compulsory Students' Industrial Work Experience Scheme (SIWES), among others (Ugwuanyi & Ezema, 2010; Ibegbulam, Ejikeme & Enem, 2017).

Upon graduation, ATGs are expected to possess skills required by automobile related industries for employment (Industrial Trust Fund (ITF) & United Nations Educational, Scientific and Cultural Organization (UNESCO), 2016). However, studies reveal that in spite of the exposure of automobile technology students to both school-based training and SIWES, there still exist skill gaps between the demand and supply of skilled personnel among ATGs (Ayonmike & Okeke; ITF & UNESCO, 2016). More so, the ITF and UNESCO reveal that the annual output of tertiary institutions where automobile technology is taught, reflects a grave disconnect from the expectations of employers of labour in automobile industries in Nigeria. Accordingly, most ATGs cannot use auto-diagnostic tools and equipment to read or clear fault codes in

modern vehicles despite their years of training (Akanbi, 2017; Okwelle, Beako & Ajie, 2017). These amass from the fact that most universities where ATGs are trained neglect the holistic approach of the learning domains. More attention is given to cognitive and affective domains with little or no attention to psychomotor domain. This has been the ordeal as graduates who went through such inappropriate approach to learning, leave school with only paper qualification but devoid of the requisite skills to be employed (ITF & UNESCO). Meanwhile, neglecting psychomotor domain will always negatively affect skills acquisition in the process. This situation has posed serious worries in the labour market, and Technical Vocational Education and Training (TVET) must strive to elicit sustainable solutions to address it.

### **Technical Vocational Education and Training (TVET)**

Literatures have revealed that TVET indeed has the mandate to rekindle the industrialization of Nigeria's economy and as well provide support systems and pathways for lifelong learning. Oviawe (2018) noted that TVET is globally recognized for its role in preparing people for dynamic engagement in occupations of functional value and an effective source of skilled workforce. The United Nations Educational Scientific and Cultural Organization (UNESCO) and the International Labour Organization (ILO) recommendation of 2000 on TVET for the 21<sup>st</sup> century define TVET as: (i) an integral part of general education; (ii) a means of preparing for occupational fields and effective participation in the world of work; (iii) an aspect of lifelong learning and a preparation for responsible citizenship; (iv) an instrument for promoting environmentally sound sustainable development; (v) a method of facilitating poverty alleviation (Oviawe, Uwameiye & Uddin, 2017). To Kukoyi (2009), TVET is a planned programme of courses and learning experiences that begin with exploration of career options, support basic academic and life skills, and enable achievement of high academic standards, leadership and preparation for industry-defined work. Oviawe (2018), further stated that TVET prepares learners for career

that are based on manual or practical activities, traditionally non-academic and totally related to a specific trade, occupation or vocation. Unlike general education, learning in TVET is centred on 'applied' as opposed to 'academic', practical as opposed to theory, and skills as opposed to knowledge. It is only sad that TVET systems in Nigeria are yet to meet up with the 21<sup>st</sup> century workplace demands and requirements of industries, especially automobile related industries. Invariably, TVET today face huge challenges in the attempt to bridge the skills gap that exists among most graduates in Nigeria.

### **The Theory of Skill Acquisition**

The theory of skill acquisition was propounded by Ackerman in 1988. As mentioned by Ackerman, the theory describes how people commence learning something through mainly explicit processes, and through subsequent sufficient practice and exposure, proceed to implicit processes. Accordingly, Ackerman described three fundamentals of skill acquisition namely general abilities/cognitive stage, formative abilities/associative stage and non-cognitive psychomotor abilities/autonomous stage. Ackerman opined that the cognitive stage is the initial stage of learning and it is often characterized by frequent errors, and learners have to think a lot about the skill and how to evaluate it.

The associative stage, according to Ackerman, is the second, largest and longest as it is characterized by a lot of practice, and as progress is made towards the next stage, errors becomes less frequent and smaller. The autonomous stage which is the third and final stage is characterized by minor errors as mastery has been gained. Ackerman noted that a careful adherence to these stages of skill acquisition reduces skills gap among people. Ackerman contented that people become highly skilled in tasks, carry out tasks with less effort, and as such, can boost their chances of gaining and retaining employment. Equally, if students who offer automobile technology are made to thoroughly go through these stages of skill acquisition while in the university, and or during industrial attachments, the problem of skills gap among ATGs would reduce greatly.

## Skills Gap

The debilitating reality of skills gap is both worldwide and worrisome as it has a deep economic impact because skills form the bedrock of every country's economy. Skills denote expertise developed in the course of training to enable effortless performance of an intellectual or physical task (Ayonmike & Okeke, 2016). Cranmer (2014) defined skills as ability acquired through deliberate, systematic and sustained effort which enables one to smoothly and adaptively carry out complex activities or job functions involving ideas (cognitive skill) things (technical skills) and/or people (interpersonal skills). Shortage of skills therefore is referred to as skills gap (Shah & Khan, 2018). The Centre Européen pour le Développement de la Formation Professionnelle (CEDEFOP) (2018), defined skills gap as a situation where skills demand and skills supply diverge.

Contextually, skills gap is that significant divide between expected skills and those observed in among ATGs. Ogbuanya (2010) and Ayonmike and Okeke (2016), observed that the contours and causes of skills gap are not elusive and can be traced to seismic changes due to continuous advances in technology and time pressure to achieve immediate results. Statistics in Nigerian have shown that more than 400,000 graduates are produced by TVET institutions annually (ITF & UNESCO, 2016). However, over 70% cannot be employed because they do not possess the required technical skills to drive the 21<sup>st</sup> century workplace results (Moldovan, 2019). In order to correctly address skills gap issues among ATGs, docile policies and practices and new ones as well, must be implemented. Hence, there is need to suggest TVET policies and practices that are sustainable and innovative.

## Innovative TVET Policies and Practices

Policies and practices are two interwoven components that help organizations to thrive in achieving their goals. While policies mean formal and written principles (Chaurasiya, 2009), practices imply the implementation of policies (Okorafor & Nnaji, 2017). The authors further commented that, through several TVET policies and practices in Nigeria, ranging

from the first national Science and Technology Policy produced in 1986 to others, it would be expected that TVET through the production of high-skilled manpower, would have launched the country into technological and economic super power in Africa. However, the authors observed that what is being experienced today of TVET, is far from expectations. That is to say, the outcome of TVET in Nigeria is indicative of the fact that TVET policies are divorced from what is practiced. No doubt, the effectiveness of an organization is not only reflected in its ability to formulate policies, but also in its ability to execute such policies effectively (Sullivan as cited in the Economist Intelligence Unit (EIU), 2010). Consequently, policy and practice are interrelated and cannot be separated. In a bid to find sustainable solutions to skills gap issues among ATGs, these innovative TVET policies and practices are proffered:

### 1. *Provision of Political Will by Government for Quality Vocationalization*

The political will of the day can ensure that educational policies are correctly enacted to improve TVET delivery to foster the aim, goals and philosophy of quality vocationalization (Oviawe, Uwameiye & Uddin, 2017). According to the authors, this policy will support the close monitoring of concerned agencies to craft and implement policies that will enable TVET students acquire 21<sup>st</sup> century skills and systematic research and innovations to facilitate their successful transition into employment or become self-employed upon graduation. If such is carried out as stated, an enabling teaching and learning environment will be created for TVET students. This will in turn help to bridge the skills gap situation among ATGs in Nigeria and as well provide the needed workforce to drive the 21<sup>st</sup> century workplaces with tangible results.

### 2. *Introduction of a Compulsory One-year Students' Industrial Work Experience Scheme (SIWES) for TVET Students*

Just as medical students spend one year in hospital as a policy, to adequately prepare for the ever dynamic health system in the world according to (Dare, Fancourt, Robinson, Wilkinson & Bagg, 2009), TVET students should also go through a compulsory one-year SIWES before graduation, as a policy against the current six-month period to enable them acquire more meaningful and relevant experiences to cope with today's workplace demands (Ayonmike & Okeke, 2016; Ekong & Ekong, 2016). With such a policy in full enactment, there will be more time for students to be exposed to more meaningful skills needed to tackle technological advancement and work roles in automobile related industries and consequently, bridge the skills gap situation among ATGs.

### 3. **School-to-workplace Collaboration**

A smooth school-to-work transition is the desire of all graduates of TVET. However, TVET institutions cannot successfully play the role of providing high quality manpower with advanced skills if it operates in isolation of the operating industries that require skilled workers (Oviawe, 2018). Oviawe further mentioned that TVET institutions must establish collaborative linkages with these industries that require their graduates. Such linkages on a well fashioned partnership and strongly supported by the government, according to Oviawe, will guarantee quality ATGs and as well facilitate their smooth transition from school-to-work. In view of these and for the success of TVET and learners, the practice of school-to-workplace collaboration is strongly advised.

### 4. **Public-Private Partnership (PPP) in TVET**

According to Oviawe, public-private partnership talks about a long term procurement contract between the public and private sectors in which proficiency of each party is focused in the designing, financing, building and

operating an infrastructure, project or providing services through the appropriate sharing of resources, risks and reward. The alliance between TVET and public-private sectors is a formidable partnership that can transform teaching and learning environment and processes as well in preparing graduates that can cope with the ever changing workplace demands in the 21<sup>st</sup> century (Okoye & Chijioke, 2013, Oviawe). With such a partnership in place, the disturbing issues emanating from skills gap will drastically reduce over time.

## **Findings and Discussions**

The following are the findings that emerged in this paper based on literature reviewed:

1. **Provision of Political Will by Government for Quality Vocationalization:** This first finding is in conformity with the findings of Oviawe, Uwameiye and Uddin (2017), which suggested that if the political will of the day can ensure that educational policies are correctly enacted to improve TVET delivery to foster the aim, goals and philosophy of quality vocationalization. The achievement of this will drastically curb the skills gap situation in the country as there will be enabling teaching and learning environment for TVET students to be trained and prepared for entry and progress in 21<sup>st</sup> century automobile related industries.
2. **Introduction of Compulsory One-year Students' Industrial Work Experience Scheme (SIWES) for TVET Students:** This second finding is in line with the findings of Ayonmike and Okeke (2016) and Ekong and Ekong (2016), who stated that for TVET to be more effective and productive, more time must be given to practical where students will acquire meaningful and relevant skills to cope with today's workplace demands. According more time to SIWES could strongly imply that students upon graduation would

have been well grounded in the relevant technical and occupational skills required to gain employment and progress in it as well. The skills gap problem among ATGs can be greatly reduced by this policy in enactment.

3. **School-to-workplace Collaboration:** This third finding is in agreement with the opinion of Oviawe (2018), who stated that TVET institutions cannot successfully play the role of providing high quality manpower with advanced skills if it operates in isolation of the operating industries that require skilled workers. The need for collaboration between school and industries is crucial to the employability of TVET graduates. Such joint collaboration can gradually eliminate the skills gap between the present and future TVET graduates (Ayonmike & Okeke, 2016).
4. **Public-Private Partnership (PPP) in TVET:** This fourth and last finding in this paper, is in tandem with the opinion of Okoye and Chijioko (2013), who noted that public-private partnership is inevitable for the full success of TVET institutions. It has been said that TVET cannot flourish alone, it needs partnership supports from auto and other allied industries to soar and exude its potentials in improving and contributing immensely to developmental and economic expectations of any society. So doing, the skills gap situation among ATGs especially can be abated with time.

### Implications of the Findings

The obvious implication of all the findings in this paper is that quality training should be provided for TVET students to enable them acquire meaningful and relevant skills needed for gaining and staying in employment in today's workplaces or becoming self-established. This also means that the skills gap situation will be significantly reduced with time. Employers of labour also will have some reasonable level of satisfaction with the level of preparedness in terms of technical and occupational skills among ATGs in Nigeria. Additionally, the findings imply that the Nigeria

and the world at large will begin to see TVET in the exact light and perspectives of its core philosophical realities, aim and goals.

### Conclusion and Recommendations

Skills gap situation is debilitating and counterproductive for ATGs, employers of labour and TVET institutions among others. It practically renders affected ATGs frustrated as they cannot cope with the 21<sup>st</sup> century workplace demands. This ugly situation can take a completely different direction for most ATGs in Nigeria. Clearly said, the skills gap challenge plaguing ATGs in Nigeria can actually be bridged or curbed if more concerted, conscious and deliberate efforts are made. What TVET need mostly are innovative policies and practices and implementing the policies towards bridging the skills gap among TVET graduates especially ATGs. This can be achieved through PPP, school-to-work collaboration and implementing a compulsory one-year SIWES in TVET curriculum among others. The resultant effect of these would have abated the worries of employers of labour at automobile related industries, increase employment rate among ATGs and improve the image of TVET in Nigeria and the world at large.

### Recommendations

Based on findings via literature, this paper proffered the following recommendations:

1. Political will should play out in ensuring educational policies are correctly enacted by designated agencies to ensure TVET recipients get the best exposure through university-industry experiences.
2. Industries, government and TVET institutions should establish robust and dynamic partnership that will enhance and deepen the skills of automobile technology students through a thoroughly monitored one-year compulsory internship programme in relevant industries to strengthen employment prospects upon graduation.
3. TVET public-private partnership should be encouraged in order to strongly

address the challenging issue of skills gap that exist among ATGs.

4. There should be collaboration between TVET institutions and the workplace to facilitate school-to-work transition.

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