*Journal of Research in Education and Society*
*Volume 11, Number 1, April 2020;* **ISSN: 2141-6753**
***Published By***
**International Centre for Integrated Development Research, Nigeria**
***In collaboration with***
**Copperstone University, Zambia**

# Establishing the Nexus between Technical Education and Industrial Development in Nigeria

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## ABSTRACT

*The role of education (especially technical education) in the development of great countries of the world is not doubtful. Ordinarily, one expects such a result in Nigeria, given the abundance of human, natural and financial resources in the country. However, this is far from being realised in the country and calls for a critical inquiry into the forces behind low industrial development in Nigeria. This study critically evaluates the role of technical education in Nigeria's industrial development. This evaluation reveals that technical education and industrialization in Nigeria are bedevilled by several challenges. Therefore, the work argues that as far as technical education in Nigeria is still battling with the challenges of underfunding, lack of basic facilities and workshops, weak government policy and poor implementation, inadequate power generation and supply, corruption, political influence, problems related to curriculum and the colonial mentality of being a form of education for the educationally disadvantaged individuals, which still drives the current discrimination against graduates of polytechnics, monotechnics, and universities, it will continually lack the impetus to ensure rapid industrial development in the country. Pertinently, far-reaching suggestions for achieving industrial development in Nigeria through her technical education and training programme are proposed.*

***Keywords:*** *Industrial development, technical education, Nigeria.*

## INTRODUCTION

Technical education equips man with the technological capability needed to drive rapid industrialization. In the view of Akpakpan (1996), it is technological capability that

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*Journal of Research in Education and Society*
*Volume 11, Number 1, April 2020;* **ISSN: 2141-6753**
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distinguishes a strong economy from a weak one, and also creates the goods and services needed for survival and growth in today's world. The rapid industrialization of a nation is tied to the acquisition of education, especially technical education. Fundamentally, technical education is a systematic way of exposing individuals to the practical training needed for developing and producing goods and services for the citizens in a country. Nigeria, as a developing country, has failed to achieve meaningful industrial development, due to a number of factors, especially overdependence on imported goods from developed countries. Therefore, acquisition of technical education is imperative to attaining industrial development, for it is a type of education that involves the application of the rudiments of science and technology for industrial design, production, distribution and services (Okorieocha and Duru, 2014).

The relationship between technical education and industrial development is not in doubt. In fact, several scholars have attested to the fact that technical education has been used by several developed nations as an instrument of industrial development and economic growth (Lawal, 2013; Okorieocha and Duru, 2014). Nigeria is industrially underdeveloped and technologically backward. Uwaifo and Uddin (2009) observe that a country is said to be technologically backward when it cannot produce capital goods such as tractors, lathe machines, drilling machines, cars, trains, and other earth moving equipment; it is unable to exploit her natural resources except with the help of foreigners who will normally provide the technology and expertise to undertake the exploitation of her natural resources; it is unable to mechanize her agriculture, that is to say, crude implements are still used for agricultural production activities by a large percentage of those who are involved in agricultural production; it depends on other countries for the supply of its spare parts for industrial machinery; it exports raw materials to other countries as against finished products; and it is unable to produce her own military hardware with which to defend herself if the need arises.

It is pertinent to ask: "Why is Nigeria not industrializing through technical education like other societies?", "What are the challenges bedevilling technical education and industrialization in the Nigeria?" and "What can be done to ensure technical education-driven industrial development in Nigeria? This work is committed to answering these posers and suggesting measures of achieving industrialisation through technical education in Nigeria. Specifically, the purpose of this study is to establish the nexus between technical education and industrial development in Nigeria.

## Conceptualising Technical Education

The National Policy on Education has defined technical education as that aspect of education that leads to the acquisition of practical and applied skills as well as basic

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scientific knowledge (NPE, 2004). It relates to a training in which learners directly develop expertise in some techniques or technical skills. In fact, it is meant to prepare learners for careers based on manual and practical activities, and thus constitutes the bedrock of sustainable development of a nation. According to Ojimba (2013), technical education therefore can be seen as the formal training of persons to become technicians in different occupations. Thus, an education that is geared towards teaching technical skills and attitudes suitable to such skills can be regarded as technical education. For Uwaifo and Uddin (2009), technical education is the training of technically-oriented personnel who are to be the initiators, facilitators and implementers of technological development of a nation. The training of people on the need to be technologically literate would lead to self-reliance and sustainability.

Lawal (2010) defines technical education as that type of education that prepares people who could apply relevant practical skills to make positive changes within their society and afford a self-dependent life. Furthermore, Lawal (2013) succinctly opines that technical education provides self employment, enhanced productivity and self-reliance; reduces the over-dependence of school graduates on government jobs; and offers individuals the skills to live, learn and work as productive citizens in a global society. According to the National Policy on Education (2004), the goals of technical education include: providing trained manpower in the applied science and technology and business particularly at craft, advanced craft and technical level; providing the technical knowledge and vocational skills necessary for agriculture, commercial and economic development; and giving training and impact the necessary skills to individual who shall be self-reliant economically.

In line with the above goals, Lawal (2013) opines that technical education has the prospect of driving a number of development targets in any country such as: generation of employment/creation of job opportunities (as it helps to develop marketable and employable skills in students/youths and reduce the rate of drop-outs or unemployment in the society); industrial development (as it can help a nation develop technologically and industrially by producing people competent and capable of developing and utilizing technologies for industrial and economic development); entrepreneurship strategy (as it offers the beneficiary the ability to be self-reliant, to be job creators and employers of labour); poverty alleviation (as graduates and technicians can keep their heads up above poverty and unemployment); promotion of the Nigerian economy (as the knowledge of technical education helps in the conversion of local raw materials, which reduces the importation of foreign goods which lessen our import dependency and encourage exportation of our local products); and promotion of Nigerian culture and value (as TE helps us to promote the Nigerian culture and causes

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us to value what we have – for example, the national and international appreciation of *Aso-Oke* and Ikot Ekpene raffia work). According to Haruna (2008), the benefits of technical education lie in its job creation role in the economy, and include preparing the individual to acquire skills for gainful employment, enabling the individual to be self-reliant through the setting up of small and medium scale enterprises (SMES); promoting human resource development as a pre-requisite for industrial development; assisting in the improvement and maintenance of managerial and technical performance in industries/ organizations; acting as a platform for ensuring sustained supply of qualified manpower to meet future needs of organizations at all levels; propelling employees to high standard of proficiency in their vocation overtime; and helping to raise the profitability and productivity of an enterprise through the effective use of highly trained manpower.

The beginning of organized technical education in Nigeria started with the establishment of Yaba Higher College in 1932, which was officially opened in January 1934. The goal was at first to train assistants for government departments and private firms, with a gradual increase in standards until the College would eventually reach the level of a British university (Nwauwa, 1997). It provided vocational training in subjects that included agriculture, forestry, medicine, veterinary science, surveying and civil and mechanical engineering. It also provided training for secondary school teachers, mainly science teachers. Technical education is especially offered in technical colleges, polytechnics, colleges of education (technical) and universities of technology in order to bequeath to individuals the basic practical skills and scientific knowledge and attitude required as craftsmen and technicians capable of providing a base for technological take-off in Nigeria (Federal Ministry of Education FME, 2009).

## Concept of Industrial Development

Industrial development means the process of building up a country's capacity to process raw materials and to manufacture goods for consumption or further production (Todaro, 1977). What readily comes to mind when industrialization or industrial development is mentioned is increased manufacturing activity. Etuk (1989) notes that industrial development is truly an activity that is limited to manufacturing as the only one sector of the economy. Industrial development is the ability of a country to manufacture equipment and gadgets that will propel massive improvement in the quality of lives of individuals in the society (Okafor, 2012). Industrialisation is the process of transforming raw materials, with the aid of human resources and capital goods into (a) consumer goods; (b) new capital goods which allows more consumer goods, including food, to be produced with the same human resources; and (c) social overhead capital, which together with

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human resources provides new services to both individuals and businesses (Zurekas, 2001 and Ekpo, 2005). Industrialization takes place whenever production is carried out on the basis of machines and fabricated tools. Thus, industrialization involves the application of scientific methods to solving problems of man in his environment. It is generally accompanied by social and economic changes, including a fall in the birth rate and a rise in per capita GNP (Effiom and Udah, 2014). Industrialization usually takes place when there is a systematic policy measure to steer resources into the productive process (Effiom, 2011). Ukommi, Agha and Ekpenyong (2013) submit that industrialization does not only entail processing of raw materials and production or manufacturing of goods but also skills to maintain and reconstruct the machines and tools and to manage the factory and effectively organize the production process.

Rapid industrialization is a veritable instrument for economic development, as it propels economic growth and quickens the achievement of structural transformation and diversification of the economy. It plays a crucial role in a strategy to raise the standard of living of the people in a modern economy by enabling a country to utilize fully its facto endowments and depend less on the external sector for its growth and sustenance (Dauda, 2004). Ekpo (2005) avers that a society develops economically as its citizens jointly increase their capacity to deal with the environment. This capacity depends on the extent to which the people understand the laws of nature (science), the extent to which they put such understanding into practice by devising technology and on the manner which work is organized.

Essentially, theories or models of industrialization are intertwined and related to economic growth and development. To that extent, theories of economic growth and development are essentially used to explain industrialization. Furthermore, an industrializing economy is basically one which experiences continuous economic growth. Thus, industrialization is imperative for economic growth and development (Effiom, and Udah, 2014). The more developed a country's industrial capacity, the greater the potential for economic growth and development. In fact, industrialization has the potential to help achieve a variety of social objectives such as employment, poverty eradication, gender equality, labour standards, and greater access to education and healthcare (Ukommi, Agha and Ekpenyong, 2013). This informs the reason successive governments in Nigeria have placed emphasis on rapid industrial development as an integral part of development planning.

Lamentably, the industrialization process across Africa is hampered by such factors as unwarranted dependency brought about by shortage of capital, low level of scientific and technological application, lack or inadequate infrastructure, fragile dependence of the private sector on the public sector, and the fact that production is

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basically primary (Adawo, 1999). Oyejide (1977) has proposed three approaches to industrial development for a developing country like Nigeria to adopt. These include the processing of raw materials available in the country, the domestic production of manufactured goods for the domestic market, and the domestic production of manufactured goods for exports. These approaches have serious implications for technical education in Nigeria. It is only a well-articulated and well-sponsored technical education that can satisfy these approaches in developing countries.

## Technical Education and Industrial Development in Nigeria: the Nexus

Nigerians were involved in many aspects of industrial and practical arts, such as hoe making, clothe weaving, bronze smelting and casting, hides and skin tanning, among others, before the advent of colonialism (Uwaifo and Uddin, 2009). The aspect of education which emphasizes skill and practical competence was however not an integral part of our colonial educational system as at that time (Uwaifo and Uddin, 2009).

Iheanacho (2006) also posits that advent of colonialism and western foreign influences were unfavourable to Nigeria in terms of vocational and technical education. Uwaifo and Uddin (2009) observe that the colonialists did not make any serious attempt to develop Nigeria's crude indigenous technologies through commitment to a viable technical and vocational exposure in our colonial educational system. The scholars further note that the colonial masters bequeathed to Nigerians a purely literary type of education and foisted on them an educational culture that recorded low on technical and vocational education which provided no viable grounds for the development of indigenous technology and attainment of technological independence. Technical education, which has experienced serious neglect right from the beginning of western education in Nigeria, enjoyed high priority in our traditional African education whose main aim is character training and job-orientation (Alabura, Iwanya, and Mattawal, 2012). Ozoro (1982) notes that it has been recognized for a long time that the largely literary curriculum in the Nigerian secondary school system does not prepare the soil to germinate and nurture science and technology. It is therefore necessary to revamp the old order and chart a new progressive and proactive course for technical education that can guarantee rapid industrial development in Nigeria.

The role of technical education is seen in producing graduates in design, construction and operation of industries; including oil, agriculture, forestry, petro-chemicals, mineral and water resources, electrical power generation and distribution, textile, iron and steel, automotive and plastics as well as in health technology, environmental designs, armaments and commercial enterprises are evidences of the

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invaluable roles of technical and vocational education in national industrial development (Aliyu and Dabban, 2009). The nexus between technical education and industrial development is obvious in the foregoing remarks.

Historically, training in specific skills was pivotal in the development of great nations. Gutek (1983) maintains that as early as 1917, a federal law (Smith-Hughes Act) was passed to provide funding for vocational/technical education in response to the increasing demand by industries for technical skills. Developed countries of the world pay serious attention to technical education to the extent of integrating it functionally into their school curriculum. For instance, van Ark (1992) reports that the Dutch school system pays attention to "high standards in mathematics and the provision of technical education at ages 14-16 for a third of all pupils, and widespread vocational education at 16 +. It is regrettably unfortunate that the Nigerian society has not learned to prioritize technical education as a panacea to underdevelopment, poverty and unemployment, among other woes.

The East Asia development practice in education, particularly the indispensable role assigned to the education and training system as a driver of sustained economic and social development provide important lessons that Nigeria can learn from. In Singapore, apart from policy shifts to align education systems with economic development, the barrier of poor public perception and image of technical and vocational education and training (TVET) was overcome by making basic workshop subjects such as metal work, wood work, technical drawing and basic electricity compulsory at secondary level. Industries, which are potential employers, have much to contribute in defining skills competencies, standards and values required, were allowed active participation in curriculum development process (Seng, 2010).

In Germany, the dual system of vocational training was adopted. This system allows for learning to take place in a vocational school and in a privately-owned but properly registered businesses or entrepreneurship agencies concurrently (Yusuff and Soyemi, 2012). The role of technical education in South Korea's technological development is even more dramatic. The combination of aggressive educational policies, visionary leadership and disciplined labour force revolutionized S. Korea and propelled her to economic greatness such that the erstwhile mendicant nation dependent on the U.S. for food aid turned a nation of cornucopia and their unquestionable technological success was evident globally even in remote West Africa with "the arrival of Daewoo cars" (Majasan, 1998).

The relationship between technical education and industrial development is a two-way approach. On one hand, Gapanski (1996) opines that technical education propels industrialisation and promotes the development of the capacity to manufacture

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goods, particularly capital goods. On the other hand, industrial development in turn provides the impetus for technical education and technological development/innovation (Gapanski, 1996). Acquisition of technological capacity, which is the ability to select, diffuse, develop or adapt technology and build on imported technology, is required this transformation to take place in Nigeria. Countries that have experienced rapid growth in recent times adopted the strategy of importing and building on established technology from abroad (Westphal, Kim and Dalman, 1985; Oyelaran-Oyeyinka, Laditan, and Esubiyi, 1996; Afonja, 2003; Haruna, 2012). Technical education can start locally and then advance to import and build on established foreign skills and technology.

Industrialization in Africa has been largely as a result of import substitution strategy. This approach to industrial development has done very little to stimulate the acquisition of local technological capability since the choice of technology, equipment, installation as well as the simple routine maintenance are carried out by expatriates (Ernst, Ganiastor and Mytelka, 1994). Unfortunately, public funded projects do suffer from technical partner syndrome (Akamatsu, 1962; Herrick and Kindleberger, 1984). The technical aspects of the project are designed to ensure perpetual dependence on the technical partner, with little or no chance of technology transfer to local personnel (Tambunlertchai, 1994). This is one sure reason why most projects failed in Nigeria.

However, the type of industrial growth which has taken place in Nigeria has failed to stimulate technical progress (Chenery, 1960; Oyelaran-Oyeyinka, 1997). Despite the fact that most of the countries in the sub-region spend substantial proportions of their annual budgets importing technology and the products of technology, there has been little progress in the acquisition of technological capability (World Bank, 1999). Scholars have observed that the wholesale adoption of complex western industrial techniques which in many cases grind to a halt or have made little impact on industrial development has been the practice of many countries in the sub-region; and that the problem, mostly, is not due to failure to assimilate technology but due to corruption and the absence of adaptation to new technology which further industrial growth needs (Afonja, 2003; Ebosele, 2012). Nigeria should learn some lessons from successful countries and adopt a working technical education that can drive her industrial and technological development.

## Technical Education and Industrial Development in Nigeria: Challenges

There are several problems bedevilling technical education and industrial development in Nigeria. These problems have not been arrested but rather continue to ensure industrial underdevelopment in the country. Lawal (2013) identifies factors which militate

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against effective technical education in Nigeria to include: misconception of the definition and meaning of the programme; wrong societal perception of the technical and vocational education programme; weak government policy and poor implementation; inadequate funding of the programme; lack of basic facilities and workshops; inadequate qualified personnel, inexperienced leaders and administrators; lack of power supply in existing workshops which limit the conduct of practical; problems related to curriculum of the programme; and political influence in technical education programme.

A contemporary problem of technical and vocational education in Nigeria is the poor training of both the provider and the receiver. The emphasis has been on developing manpower forgetting that there should be well trained and well motivated manpower to subsequently create and develop further manpower (Okorieocha and Duru, 2014). Nwosu (1992) laments that though technical colleges have been established by both Federal and State governments, with vocational training centres built by governments, individuals and organizations, polytechnics and similar institutions established in all States, yet there is acute shortage of technical teachers. Ekpenyong (2005) argues that technical education in Nigeria is crippled by lack of funds and inadequate infrastructure. Ejike (1990) points out that the inability of Nigerian government to adequately finance technology and technology education is a serious impediment to national growth and development. Similarly, Olaitan (1996) cited in Okorieocha and Duru (2014) notes that the low level of effectiveness of technical and vocational education in Nigeria are due to lack of coordination of the programmes, inadequate facilities for learning, programmes are not quite job-oriented, teachers are poorly remunerated or motivated.

The major hindrances to the growth of technical education include dearth of technical teachers, weak capital base, poor funding, poor technology, among others, which result in graduates with low skills (Okolocha, 2012). Nigerians have historically considered technical education as an education programme meant for low level, low brilliant and less privileged or second class citizens (Okoro, 1993; Eze and Okorafor, 2012). This has hunted the success of technical education in the country. Okafor (2011) avers that successive government in Nigeria has neglected technical education, and consequently, the society lacks skilled technicians such as bricklayers, carpenters, painters and auto mechanics; laboratory and pharmacy technicians, electrical/electronic technicians and skilled vocational nurses). Most of our youths in recent times only engage in these skilled occupations only when they are frustrated beyond measure.

Problems of industrial development in Nigeria have been identified by Ndebbio (1985, 1989) to include lack of a strong industrial research capacity or base; little or lack of understanding of the importance of R&D by both our leaders in the public

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sector and industries in the private sector; inadequate attention to the development of rural areas; the country's narrow industrial base caused by the delay in developing key industrial plant linkages; political instability occasioned by several changes of government between civilian and military on one hand and military and military on the other hand cannot be ignored; the despicable tendencies or habits of some Nigerians such as poor work ethics, greed, sheer lack of sense of commitment and endurance, unparallel enthusiasm to circumvent the law and cheat; low exchange value of the naira relative to other major foreign currencies; dependency on foreign countries (Adawo, 1994); and other environmental conditions such as communal land tenure, traditional and administrative systems (Teriba and Kayode, 1977).

Most of the government attempts at establishing an industrial base have failed due to executive corruption motivated by socio-political considerations (Okafor, 2012). Corruption has serious implications for industrial development in Nigeria, as the country has remained perpetually backward due to infrastructural problems and other challenges such as inadequate power supply, multiple taxes, harassment by officials of government agencies, insecurity and others, which are highly powered by corruption (Okere, 2012). Corruption is indeed the bane of industrial development in Nigeria.

One regrettable impact of the challenges facing technical education and industrial development in Nigeria is that of brain drain; some teachers/lecturers of technical education have moved to other countries of the world and to other professionals (especially politics). Akintunde (1989) identifies five different components of brain drain to include: experts in academics who moved to the industry where they get better pay for their services; lecturers and students who leave the country to acquire more knowledge and skills but later refused to return; lecturers who move from one country to another for other conditions of service; skilled professionals who abandon the practice of technical education in favour of other more lucrative economic activities and political appointments which are not related to their training; and skilled professionals, although in their field of training they do not devote their full attention to their job because of their effort to supplement their earning through other unrelated economic activities. It is glaring, based on the foregoing challenges, that a functional industrial development in Nigeria is not attainable under a faulty technical education.

## Strategic Suggestions for Ensuring Nigeria's Industrialisation through Technical Education

It is obvious from available literature that technical education has inspired and driven industrial development in developed societies, but has failed to achieve the same result

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in Nigeria and other developing societies because of the challenges bedevilling the duo of technical education and industrial development in the country. The suggestions below are essential if Nigeria must efficiently industrialize through technical education.

### *Provision of Adequate Funding*

Generally, Nigeria's education sector is poorly funded, resulting in poor remuneration of lecturers and non-teaching staff, inadequate funding of research and development, and obsolete learning facilities, among others (Aturu, 2011 and Ojimba, 2013). This poor funding is orchestrated by government's failure to implement the internationally-approved 26% budgetary provision for education. Aturu (2011) refers to Nigeria's 2010 expenditure in education where the UNESCO's recommendation of at least 26% of national budgets on education was not executed, but rather the Federal Government spent only N249.08 Billion (6%) on education out of a budget of about N4.07 trillion. Nigerian governments at all levels are encouraged to implement the internationally-recommended 26% of their budgets to education. Out of this, technical education should be handsomely funded. Rather than spend tax payers money establishing General Studies Universities, the existing ones should be well funded so that both staff and students will be motivated to make their contributions to the development of the country (Ojimba, 2013). The Nigerian government should increase the percentage of its total expenditure on education (including technical education). As a matter of fact, countries that have complied with this international provision are reaping the benefits today.

### *Provision of Adequate Facilities*

According to Ojimba (2013), most technical education departments in Nigerian universities do not have laboratories or workshops space let alone usable equipment and facilities; and where they exist, they are grossly inadequate, as the laboratories only have the items or equipment that were provided when the departments were established. Oryem-Oriya (2005) posits that most technical education departments still depend on engineering workshops and lecturers to teach technical education concepts in this 21st century. The bottom line is that facilities and equipment should be adequately provided to our technical institutions and higher institutions of learning. Also, regular maintenance of the facilities and equipment should also be ensured.

### *Provision of Manpower Training*

Adequate manpower training is a panacea to our fledging technical education and industrial development. Primary/secondary school teachers, polytechnic/university lecturers and other technical experts should be adequately trained to impart technical

 

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knowledge and skills that can drive the industrial development we desire. This still reflects on adequate funding by the government and all stakeholders. Importantly, qualified technical teachers and lecturers should be recruited all over the country to teach technology-related and industrial development courses. Industrial sociologists have a role to play here. It is also recommended that adequate workforce should be provided to our school at all levels. This can be achieved by providing competitive salaries and other incentives. Upgrading opportunities for technology and vocational teachers should be provided through workshops, seminars and conferences. It is also required for technology and vocational education teachers to obtain highest qualification possible in their field (Lawal, 2013).

### *Steady Energy Production and Supply*

Lawal (2013) postulates adequate energy production and supply as a panacea for industrial development, arguing that it was abundant energy supply that launched Europe into the industrial revolution. A situation in which Nigeria has abundant deposits of natural gas and coal and yet fails to supply adequate power is ignominious. Of course, industrial development in Nigeria can be achieved if we have a steady and sustainable supply of electricity. Now that the power sector has been privatized, attempts should be geared towards constant supply of power. It is interesting to note that our indigenous technical experts and industrialists rely so much on electricity for their operations. So, constant power supply will encourage them and boost their industrial activities.

### *Stop the Discrimination against Graduates of Polytechnics/Technical Education*

The discrimination against graduates of polytechnics and technical institutions in terms of recruitment, grading and other working conditions should be stopped. We are aware that university graduates (Bachelor Degree holders) were placed and paid higher than their polytechnic counterparts (Higher National Diploma holders) in the civil service, education sector and banking sector, among others. This discrimination for whatever reason was baseless. In fact, in most cases, it takes more time to bag the HND certificate than the B.Sc. Degree, because of compulsory industrial trainings (I.T.) undertaken by polytechnic students which students of social sciences, arts and management courses in the university do not undertake. We call for full implementation of parity in recruitment and career progression for both HND and Bachelor Degree holders. Technicians and all who pass through our technical-oriented schools ought to be adequately and equitably remunerated. The abolishment of the dichotomy in the civil service between holders of "General Studies" certificates and technical certificates must not only be as a matter of policy in the thinking and attitude of government officials but full implementation in

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terms of privilleges and motivation packages. The truth of the matter is that technicians or technologists are not inferior. It is a matter of career choice and we should make this very clear to our children right from the primary schools (Ojimba, 2013).

### *Re-design the Curriculum of Technical Education*

Our syllabuses need to be re-innovated and re-designed to include disciplines that have technical appeal. Olunloyo (2002) has noted that one of the issues confronting the design of appropriate curriculum for technical education is preparing students for the shift from the fordist to ICT paradigm in technology practice. Other problems inherent in the curriculum design of technical education in Nigeria are that it is based on a foreign model; it lacks textbooks and other teaching materials; shortage of highly competent indigenous teaching and support staff with sufficiently wide practical experience of technology; the curricular are too academic and over-loaded with intellectual content in pure science and mathematics at the expense of basic engineering and technology; and the teaching approach follows the conventional method of transforming knowledge across through the lecturer reading out to students, who would then take down notes. We therefore recommend that technical education curricular should be re-designed to accommodate our indigenous models and drive industrial development based on practical and scientific approaches.

### *Commercialize Research Findings*

According to Uwaifo and Uddin (2009), there are a good number of research institutions in Nigeria. Some of these are Product Development Agency, (PRODA) Enugu, Federal Institute of Industrial Research, (FIIRO) Oshodi, Nigerian Institute for oil Palm Research, (NIFOR) Benin City, Rubber Research Institute of Nigeria, (RRIN) Benin-City amongst others. These institutions have made a good number of findings or inventions but the lackadaisical private sector has not thought it fit to commercialize these inventions. Our universities and polytechnics have also invented different equipment, which nobody has bothered to commercialize for effective productivity. Today these Research institutions are a mere shadow of themselves, as the Nigeria factor has not helped them develop further. Efforts should be made to commercialize research findings and innovations made by teachers, research institutions, technicians, students and other experts.

### *Provision of Good Leadership/Political Will*

In the final analysis, good leadership is required to execute and achieve a functional technical education that can ensure rapid industrial development in Nigeria. It is not as if we do not have good policies and projects which can translate to rapid industrialization

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in the country, but most often good leaders or managers are not brought into the picture to initiate and execute the policies. Koontz, Donnel and Weinrich (2002) better explain that "the importance of good leadership is nowhere better dramatized than in the case of many underdeveloped countries where provision of capital or technology does not ensure development. The limiting factor in almost every case has been the lack of quality and vigour on the part of managers". The moment we look beyond religious and ethnic sentiments to entrust good leaders, managers or experts with the responsibility of directing the course of technical education in Nigeria, then the possibility of industrializing through education will become feasible.

Importantly, there should be a strong political will on the part of our politicians/ policy makers/leaders to sincerely initiate and implement all policies, programmes and projects concerning technical education and industrial development; and fight corruption in all sectors of our national life to a standstill.

## CONCLUDING REMARKS

This study has evaluated the role of technical education in Nigeria's industrial development. The evaluation denies the fact that Nigeria is industrializing through technical education. The challenges bedevilling technical education and training in Nigeria are too serious to the point that technical education cannot drive industrial development in the country. In fact, the challenges have negative implications for the country's industrial development. This leaves a lot to be desired; a country with ineffective technical education and low industrial development cannot achieve technological advancement. It is obvious that the colonial-imposed technical education that was founded on wrong philosophy of destroying our traditional technical prowess cannot drive our industrial development. It is therefore necessary for the government to revamp the old order and chart a new progressive and proactive course for technical education that can guarantee rapid industrial development in Nigeria. Pertinently, Nigeria has to fully prioritize and support or fund her technical education package in order to achieve an appreciable industrial development in this current age of global competitiveness.

Successful industrial development can be achieved in Nigeria through addressing the challenges facing technical education in general. Technical education should be seen as a valid passport to a good job and not as a second best choice or only educational route for the less academically endowed people. It is imperative therefore to address the challenges facing technical education in Nigeria so that it can successfully determine rapid industrial development in the country.

*Journal of Research in Education and Society*
*Volume 11, Number 1, April 2020;* **ISSN: 2141-6753**
***Published By***
**International Centre for Integrated Development Research, Nigeria**
***In collaboration with***
**Copperstone University, Zambia**

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