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# An Evaluation of the Role of Technical Education in Nigeria's Industrial Development

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## *Abstract*

*The rapid industrialization of any nation is tied to the acquisition of education, especially technical education. The relationship between technical education and industrial development is not in-doubt. Nigeria seems to be industrially under-developed as a result of her technological backwardness. This paper evaluates the role of technical education in Nigeria's industrial development. The analysis is qualitative in nature but with far reaching implications for achieving industrial development through technical education. The study adopts dependency theory as its theoretical framework because of its relevance in explaining the importance of technical education in Nigeria's industrial development. The paper has succinctly articulated the history of technical education in Nigeria, importance and benefits of technical education as well as colonial influences. Strategies of Nigeria's industrial development from independence have been put in perspective as well as the seeming challenges of technical education in Nigeria. It is on the strength of these challenges, that the paper recommends adequate funding, manpower training, steady energy production and supply, political will/good leadership as possible solution to achieving industrial development through the instrumentality of technical education in Nigeria.*

**Keywords:** technical education, industrialization and development

## **Introduction**

Sociologically, education is a process of acculturation through which people are guided and trained to develop their potentials, talents and skills necessary for their overall development and that of their societies. It is indeed a major indicator of knowledge and skills development, and thus has the potential for transforming and equipping man with the cognitive and innovative abilities which position him to contribute meaningfully to the overall development of his society. In particular, technical education equips man with the technological capability needed to drive rapid industrialization. According to Akpakpan (1996), it is technological capability that 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 any 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 any country. Nigeria as a developing country has failed to achieve any meaningful industrial development because of a number of factors; principal among them is overdependence on imported goods from the developed countries. Nigeria has abundant natural resources but lacks the necessary vocational and technical knowledge and manpower to transform these resources into finished products.

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 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 scientific knowledge (NPE, 1981). 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 any nation.

According to Ojimba (2013), technical education therefore can be seen as the formal training of persons to become technicians in different occupations. Thus, any education that is geared towards teaching technical skills and attitudes suitable to such skills can be regarded as technical education. An industry is the transformation of raw or intermediate products through mechanical means into consumables of various types (Girigiri, 1998). 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. Truly, industrial development is an activity that is limited to only one sector of the economy – manufacturing (Etuk, 1989). 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).

The relationship between technical education and industrial development is not in doubt. In fact, several scholars have attested to the fact that technical education and training has been used by several developed nations as an instrument of industrial development and economic growth (Lawal, 2013; Okorieocha and Duru, 2014). Rapid industrialization through technical

education in Nigeria is far from being realized. Nigeria is industrially underdeveloped and technologically backward.

According to Uwaifo and Uddin (2009), 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 equipments; 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, i.e. 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.

This paper examines the role of technical education in Nigeria's industrial development. It is pertinent to ask "Why is Nigeria not industrializing through technical education like other societies?", "Are there challenges bedeviling technical education and industrialization in the country?" and "What can be done to ensure technical education-driven industrial development in Nigeria? This paper is committed to answering these posers. Interestingly, the study adopts the method of content analysis. As a result, relevant information from conference proceedings, books, periodicals, journals, and the Internet, concerning technical education and industrial development in Nigeria are critically digested. The analysis is basically qualitative and descriptive in nature, but has far-reaching implications for achieving industrialization through technical education in Nigeria.

### ***Conceptual Clarification: 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 scientific knowledge (NPE, 1981). 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 any nation. According to Ojimba (2013), technical education therefore can be seen as the formal training of persons to become technicians in different occupations. Thus, any education that is geared towards teaching technical skills and attitudes suitable to such skills can be regarded as technical education.

Furthermore, Uwaifo (2009) posited that technical education is the training of technically-oriented personnel who are to be the initiators, facilitators and implementers of technological development of a nation. He opined that this training of its citizenry on the need to be technologically literate, would lead to self-reliance and sustainability. He stressed that technical education more than any other profession has direct impact on national welfare. However, technical

education contributions are widespread and visible ranging from metal work technology, mechanical/automobile technology, electrical and electronic technology, building and woodwork technology etc. Consequently, technical education can serve as change agents not only for technical systems but also for many other societal changes. The practical nature of technical education is unique in content and approach, thereby requiring special case and attention. The inputs of technical education are so visible to the extent that even an illiterate could see when failures occur.

Lawal (2010) sees technical education as that type of education that prepares people who could apply relevant practical skill to make positive changes within their society and afford a self-dependent life. Succinctly put, he 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 life technical knowledge and vocational skills necessary for agriculture, commercial and economic development; and giving training and impart the necessary skills to individual who shall be self-reliant economically.

In line with the above goals, Lawal (2013) opinionated that technical education has the prospects 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 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.

### ***Industrial Development/Industrialization***

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 (Iodaro, 1977). What readily comes to mind when industrialization or industrial development is mentioned is increased manufacturing activity. Truly, industrial development is an activity that is limited to only one sector of the economy – manufacturing (Etuk, 1989). 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).

Industrialization has been conceptualized as 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 human resources provide new services to both individuals and businesses (Ekpo, 2005; Zurekas, 2001). Industrialization takes place whenever production is carried out on the basis of machines and fabricated tools. Industrialization involves the application of scientific methods to solving problems, mechanization and a factory system, the division of labour, the growth of the money economy, and the increased mobility of the labour force – both geographically and socially. Industrialization is generally accompanied by social and economic changes, such as a fall in the birth rate and a rise in per capita GNP. Urbanization is encouraged and groups of manufacturing towns may form. Within the developed world, the growth of the factory system led to the separation of home and workplace with major repercussions for urban social geography (Effiom and Udah, 2014).

For Abba *et al.* (1985, cited in Ukommi, Agha and Ekpenyong, 2013), industrialization is the process of developing the capacity of a country to master and locate, within its borders the whole industrial production of raw materials, production of intermediate products for other industries, fabrication of machines and tools required for the manufactures of the desired production and other machines; skill to operate, maintain and reconstruct the machines and tools; skill to manage factories and to organize the production process. Implicit in this definition is 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.

Lamentably, the industrialization process across African countries does not correspond with the exact definition of Abba and others. Most of the machines, raw materials, expertise spare parts and tools are imported. This poses an insurmountable problem in the face of continuous dwindling of foreign exchange earnings being competed for by many other sub-sectors of the economy. This unwarranted dependency is brought about by shortage of capital, low level of scientific and technological application, lack or inadequate infrastructure and the fragile dependence of the private sector on the public sector. Also, the production is basically primary (Adawo, 1999). Technical education promises to remedy this problem of unwarranted dependency on imported industrial tools and processes, but this is far from being actualised in Nigeria.

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 any strategy to raise the standard of living of the people in any modern economy by enabling a country to utilize fully its facto endowments and to depend less on the external sector for its growth and sustenance (Dauda, 2004). 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). A little wonder that successive governments in Nigeria have placed importance on rapid industrial development as an integral part of development planning.

Oyejide (1977) has identified three approaches to industrial development which a developing country like Nigeria may adopt: 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.

### **Theoretical Framework**

The role of technical education in Nigerian's industrial development can best be understood if properly discussed within the context of relevant theories. One of such theories is the dependency theory. Major proponents of dependency theory include: Andre Gunder Frank who envisions a capitalist world economy divided into two major components of metropolis and satellite, that ensures the under development in the satellite developing nations like Nigeria; Immanuel Waltersteins, who sees the same phenomenon but in terms of the core and the

periphery nations. The basic tenet of this theory is that industrially backward nations like Nigerian owe their industrialization problems to their integration into the world capitalist system. This integration, the theory argued, creates a dependency syndrome for the developing countries. It ensures the appropriation of surplus from the developing nations to the core capitalist west, thereby consigning the developing countries to industrial backwardness.

Arguing within the dependency framework, Kodjo (1984) has been of the view that obsession with technological "take-off" usually serves as a smoke screen for a growing dependency on western inputs for industrial development. From this point of view, it means that Nigeria as it were, has sufficient technical institutions that should produce enough technically skilled manpower for the development of the country much higher than present reality, insufficient funding, poor facilities, inadequate curriculum, unsteady energy production and supply etc perpetuated by bad leadership and gadget hungry technical elites, have been the bane of technical education in Nigeria. Though this theory is not without criticisms, it is a logical and to a large extent, sound and empirically adequate perspective on the problem of industrial development in Nigeria.

#### *History of Technical Education in Nigeria*

Missionary schools established in the 19<sup>th</sup> century in Nigeria, such as Blaize Memorial Industrial School in Abeokuta and CMS Grammar School in Lagos and Hope Waddell Institute in Calabar, which casually introduced farming, bricklaying and carpentry, but these were not regarded as integral parts of Western education. The beginning of organized technical education in Nigeria started with the establishment of Yaba Higher College in 1932 by E.R.J. Hussey, who became Director of Education in Nigeria in 1929. 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).

An all-male residential institute, Yaba Higher College was officially opened in January 1934, and 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. The College was affiliated with the University of London, and offered limited diplomas, forcing Nigerians who wanted higher education to either go abroad or earn external degrees from the University of London through correspondence courses (Nkulu, 2005; Nwakanwa, 2010).

Replacing the Yaba Higher College, the Yaba College of Technology (YABATECH) was established in Lagos in 1947 as the first Nigerian higher educational and/or technical institute. It attained autonomous status in 1969 by virtue of Decree 23 which granted it the mandate to provide full time and part-time courses of instruction and training in technology, applied science,



commerce and management, agricultural production and distribution, and for research.

In 1952, three colleges of Arts, Science and Technology were established in Zaria, Ibadan and Enugu. These colleges recorded poor enrollment figures because of the general belief then that technical education is inferior to other types of education. More so, out of these three institutes only the one at Ibadan offered courses in Agriculture. In 1962, these colleges were closed and their assets taken over by the first generation universities of Ife, Zaria and Nsukka. After, little effort was made to encourage technical education in the country, for instance, in the Northern region, there were only three trade centers located at Kaduna, Bukuru and Kano. In the 1970s more universities, polytechnics, and other colleges of higher learning were established but most of them were not technically-oriented as they offer courses in languages, liberal arts and social sciences (Okoricocha and Duru, 2014).

Furthermore, Okoricocha and Duru (2014) asserted that the period between 1980-1983 saw the establishment of specialized technical institutions (i.e. Federal Universities of Technology) to cater for manpower training in science and technology-related areas, but these universities were underfunded with inadequate facilities. This led to the merger of these universities with bigger ones by the Buhari/Idiagbon regime in 1984. Although these universities got their status restored between 1988-1991, only little progress was recorded in the area of technology.

Also, within the same period two of the universities were renamed universities of Agriculture (Makurdi and Abeokuta) and later another one was established in Umudike, Southeastern Nigeria. From the 1990s to date, there has been an increase in the number of technical colleges, monotechinics, polytechnics and universities of technology; and a remarkable expansion of various technical institutions in the country in terms of infrastructure, enrollment figures, and course contents. Interestingly, three polytechnics (Kaduna Polytechnic, Polytechnic of Ibadan and Yaba Polytechnic) have been upgraded to degree awarding institutions.

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. The Federal Ministry of Education reported that in 2005 there were 159 recognized technical colleges offering trades in National Technical Certificate (NTC)/National Business Certificate (NBC) level with a total enrolment of 92,216 students (of whom 86.7% were males) (Federal Ministry of Education FME, 2009). It is not the number of technical institutions that Nigeria has that is the matter; rather it is the ability of the government to adequately fund these institutions that can ensure rapid industrial development in the country.

### ***Colonial Influence and Nigeria's Technical Education***

The formal education we have today is a colonial heritage. Regrettably, it was only articulated to serve the colonial purpose of manipulating Nigerians to whims and caprices of the colonial masters. This is evident in the statement of Lord Lugard in 1921 thus, "The chief function of government primary and secondary schools among primitive communities is to train the more promising boys from the village schools as teachers for those schools, as clerks for the local native courts, and as interpreters" (Lugard, 1921 cited in Uwaifo and Uddin, 2009). With this philosophy, it is pertinent to state that colonial education did not support our indigenous technical skills.

One of the reasons for British colonization of the Nigerian entity is economic (Boahen, 1966). The British saw Nigeria as a ready market for their spirits, dane guns, mirrors and other goods. But before the advent of colonialism, 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 (Uwaifo and Uddin, 2009). However, the colonialists discouraged further development of Nigerian technology as they reasoned it was a threat to the smooth marketing of goods imported from Europe. They termed the locally gin (*ogogoro*) illicit gin and persecuted indigenes caught producing, marketing or consuming it (Akaninwor, 2008). It is certain that the philosophy of Nigerian education during the colonial period was built on the wrongly articulated. It is therefore not surprising that apart from the Yaba Higher College that was established in 1947 to produce middle level technical manpower, the colonialist only established secondary schools that were meant to produce clerks, missionaries, and interpreters. 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 posited that advent of colonialism and western foreign influence were unfavourable to the area now called Nigeria in terms of vocational and technical education. This influence of colonialism forced our fledging indigenous technological development on a foundation of poorly mastered foreign technologies. In other words, western type of education came and hijacked our indigenous processes of technical education and vocational education. Invariably, we abandoned our indigenous technology and focused on foreign technology which we could not properly adapt to our environment. Uwaifo and Uddin (2009) observed that up to the end of the Second World War, there was no serious attempt to develop our crude indigenous technologies through commitment to a viable technical and vocational exposure in our colonial educational system. Rather our colonial masters bequeathed to us a purely literary type of education. They foisted on Nigerian people an educational culture that recorded low on technical and vocational education which provided no viable grounds for the development of indigenous technology and impeded any form of technological independence.

Technical education has experienced serious neglect right from the on-set of western education in Nigeria. This is because this type of education enjoyed high priority in our traditional African education whose main aim is character training and job-orientation (Fafunwa cited in Alabura, Iwanya and Mattawal, 2012). But with the coming of missionaries along with Western education, technical education was accorded low priority as the emphasis then was completely on literary education. Ozoro (1982) noted 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. We cannot expect the colonial imposed technical education that was founded on wrong philosophy of destroying our traditional technical prowess to drive our industrial development. It is therefore necessary for us to revamp the old order and chart a new progressive and proactive course for technical education that can guarantee rapid industrial development in Nigeria.

### *Strategies of Industrial Development in Nigeria*

Some strategies/policies, such as the import substitution, structural adjustment programme (SAP), and indigenization policy, have been implemented by successive governments in Nigeria in order to advance industrial development in the country. Let us briefly examine the accolades and knocks of these strategies as they have soared in the industrial firmament of Nigeria.

**Import Substitution:** Import substitution industrialization (ISI) involves the establishment of domestic production facilities to manufacture goods that were hitherto imported. Its primary objective was to provide favourable domestic conditions that will stimulate industrial production and thus avoid what is generally seen as an unfair competition from the already industrialised and technically more advanced North (Ogbagu, 1995). Import substitution may be regarded as an attempt to industrialize through the process of gradually establishing industries for the production of goods which hitherto were imported by a country. It presupposes that the process will be undertaken with the aid of those companies from whom the goods were imported into the import substituting country (Giigiri, 1998).

According to Uwaifo and Uddin (2009), the major industrial policy that Nigeria embarked upon after independence was import substitution industrial policy. The major thrust of this policy was building of assembly plants in Nigeria; importation of completely knocked down (CKD) parts into Nigeria to be assembled in these plants; the establishment of steel plants, like Delta Steel Plant and Ajaokuta Steel Plant, and associated foundries that were to produce automobile parts that would be assembled in already established assembly plants; and the establishment of machine tool companies (like Oshogbo Machine Tool Company) that were supposed to produce capital goods. The import substitution industrial strategy did not go beyond the stage of building

the assembly plants, as the technical partners know that if Nigeria stops importing CKD parts, their companies in Europe would automatically stop production and eventually fold up. It meant that Nigeria would no longer be a market for European cars.

In Nigeria, the policy of import substitution gave rise to an unprecedented foreign and government investment in the industrial sector. This expectedly led to an increase in industrial activities. This is evidenced by the fact that the manufacturing sector in Nigeria which "in 1957 contributed only about 1.7 percent of the country's Gross Domestic Product (GDP) rose to 5.8 percent in 1966. Further increase were recorded in 1974/75 and 1975/79 to 6.5 and 6.6 percent respectively. This trend in industrial growth continued such that in 1976/77, it rose again to 7.7 percent; in 1977/78 it stood at 9.0 percent and to 10 percent in 1978/79. Indeed, the country's GDP grew by about 14 percent for the period between 1975-79.

For the same period, the manufacturing sector alone recorded about 26 percent. When put in monetary value, the value of manufacturing rose from N17.6 million in 1950, to N683.9 million in 1975. Also, the import substitution programme brought about significant increases in the number of industrial establishments in Nigeria; they rose from 649 in 1963 to 1,036 in 1974 and again to 1,310 in 1976. The increase in industrial establishments meant opportunities for employment. The number of people employed rose from 26,631 in 1963 to 128,519 in 1970; 274,738 in 1974 and to over 1 million in 1976 (Ogbuagu, 1995).

In spite of the above advantages, the import substitution programme has been criticized because it did not break Nigeria's dependence on the export of primary goods which was one of the primary aims of the policy, and also did not lessen the need for imports; rather, the type of imports changed from consumer goods to manufactured goods (Boxborough, 1979 cited in Okoereke and Epke, 2002). Furthermore, the need to ensure the success of the import-substitution programme meant that tariffs on manufactured imports were raised as a means of discouraging imports by making it more expensive. In consequence, American and European multi-national corporations simply had to set up subsidiaries in these Third World countries, but this did not mean change in ownership. Clearly therefore, many of the import substitution industries were owned by foreign investors. Ogbuagu (1995) points out that out of 970 industrial enterprises which were in actual operation and employing between 10 and 2,000 workers in 1965, over 340 of them was owned wholly or partly by foreigners. These private foreign enterprises were mainly multi-national corporations, usually large and technologically sophisticated. But indigenous investments focused on small-scale industrial activities.

The large presence of foreign capital as symbolized by the MNCs meant their virtual monopoly of vast technology, and financial resources gave them an advantage over the indigenous enterprises. Asante (1995) argues that the programme was import-intensive and required both intermediate and capital goods from abroad to sustain production. Consequently, the economy became

expertise to the emergent entrepreneurial and managerial class; reduce considerably the existing and future expatriate quota in the Nigeria economy; and above all raise the level of intermediate capital goods in distribution.

To enhance the achievement of these goals, Nigeria enterprises were divided into three schedules. The first schedule contained those activities in which Nigerians are expected to own 100 percent. This dealt essentially with services sector activities like retail trade, dry cleaning, hairdressing and other enterprises such as some road haulage, bottling, tire trading, block, bricks and tiles production, and bread and cake making. Under schedule two were listed about fifty-seven enterprises which included such activities as manufacturing of cement and paint, furniture, beer brewing, plywood production, wholesale distribution, paper conversion, electronic assembly, clearing and forwarding, meat, fish and poultry processing, to mention some of them. Schedule three had thirty-nine enterprises listed under it. And these included, among others, ship building, drugs and tobacco manufacturing, agricultural equipment, and textile industries.

The ownership structure of the enterprises in the three schedules are distributed in such a way that schedule I was to be owned exclusively by Nigerians, in schedule II, Nigerians are expected to own at least 60 percent, while schedule III prescribed a minimum of 40 percent to Nigerians. To enhance the participation capacity of Nigerians in this programme, Ekekwe (1986) points out that the Federal Government acquired 40 percent of the shares in foreign banks and made it mandatory for them to set aside 40 percent of their loan for use by Nigerian business men. Other institutions established to enhance the implementation of this policy include, the Nigerian Enterprises Promotion Board (NEPB), the Capital Issues Commission (CIC), and the Nigerian Bank for Commerce and Industry (NBCI) (Ugbor, 1988).

The indigenization programme, however, did not indigenize any substantial part of Nigerian industry (Ekekwe, 1986), and thus contributed very little to the primary aim of turning over the economy of Nigeria to Nigerians. Furthermore, Ake argued that the main achievement that could be credited to the policy was that it facilitated accommodation between local and foreign capital by defining their areas of jurisdiction and cooperation. However, the accommodation that emerged simply "confirmed the traditional division of labour between the Nigerian bourgeoisie and foreign capital in which the former maintained the political conditions for accumulation and ran the commercial and service sectors while the latter controlled technology and the production lines as well as the big enterprises".

Furthermore, schedule I which was exclusively reserved for Nigerians contained activities that are strategically unimportant. In addition, many of the enterprises under schedule II and III still remained under the control of expatriates who bought off the enterprises from Nigerians. In fact, many of the Nigerians who benefited from the programme were fronts of their foreign masters or partners. Thus, even though those Nigerians who participated in the indigenisation programme were usually the wealthy and most strategically

placed class, they did so to further advance the interest of the foreign bourgeoisie and the locally dominant classes.

In this relationship, Ekekwe (1986) laments that the locally dominant class is most likely to be junior partner to foreign capital and that even where the locally dominant class appropriates the state to aid its own economic purposes, this situation hardly changes. The locally dominant class or bourgeoisie is historically weakened by their dependence or comprador status. Their lack of independence makes it impossible for them to take the initiative, dislodge foreign capital and take control of production processes in Nigeria. More than that, it has been contended that in spite of the indigenization programme, the commanding heights of the Nigerian economy still lie in the hands of foreign multinational firms. In terms of managerial skills, capital and technology, state influence over these companies is weak. Medium scale business is still dominated by the foreign sector. In other words, we have two cases of marginalization.

In the global economy, Nigeria is marginalized as a producer of exports and consumer of imported items. In the local economy, Nigerian businessmen are marginalized to small capital based sectors, a situation which the third schedule of the abrogated indigenization decree formalized (Broad Street Journal, Feb. 27, 1989: 7). It should be noted that the indigenization policy in Nigerian was not an industrialization programme *per se*. It was intended as a comprehensive approach directed at the localization of control and ownership of the economy. One thing which is not in doubt is that the policy failed to realize its objectives. Thus, the search for an appropriate industrialization policy has continued in Nigeria (Girigiri, 1998).

**Structural Adjustment Programme (SAP):** The Structural Adjustment Programme (SAP) is a development strategy or an economic policy package usually foisted on developing countries (Third world Countries) facing economic difficulties or crises by the two well-known international financial institutions, the IMF and World Bank (Okereke and Ekpe, 2002). SAP was adopted in Nigeria in 1986 by General Ibrahim Babangida as economic and industrial development strategy. It was believed that SAP would solve economic and industrial problems of Nigeria by correcting or addressing some of the structural imbalances inherent in the economy prior to its introduction in 1986. In the words of Guitian (1982), SAP is simply aimed at restoring and maintaining viability in the balance of payments in an environment of price stability and sustainable rates of economic growth.

The key pillars or elements of SAP include privatization and commercialization, trade liberalization, deregulation of prices, withdrawal of subsidies and devaluation (Onwuka, 2005), and reliance on market forces for the determination of the value of the national currency. The policy was embarked upon to attract core investment in the country's industries (Girigiri, 1998). According to Onah (1988), the broad aim of SAP include correction of

balance of payments imbalance, elimination of distortions and promotion of macroeconomic efficiency, reduction of high inflation, resumption of output growth, diversification of export base of the economy, establishment of a realistic exchange rate, and introduction of commercialization and privatization of some government parastatals and indeed deregulate the economy.

SAP recorded some laudable achievements in Nigeria. It introduced discipline in public and private resources use. For instance, industries in Nigeria were forced to source their inputs locally under a programme of backward integration. SAP also abolished the wasteful and corrupt import licensing regime through which socio-economic parasites and non-producers had managed to make huge gains for hawking import licenses (Obinozie, 1999).

In addition, SAP enforced a sense of creativity among Nigerians. Many Nigerians began to do things with their hands, fabricating and producing to meet daily needs of the people. Rather than searching for employment opportunities that was non-existent, people saw the need for self-employment and self-reliance (Okereke and Ekpe, 2002). In spite of the gains associated with it, SAP has failed to achieve economic and industrial development for Nigeria. According to Onwuka (2005), SAP complicated the country's economic crisis and created new crises specific to its own contradictions as the state employed force to cow the people during the implementation of the unpopular policy. Okereke and Ekpe (2002) are of the view that SAP generated social and political tensions and caused mass unemployment. The latter was as a result of reduction of public expenditure through downsizing of the public service workforce as one of the conditionalities of the SAP.

According to the *Guardian Newspaper* of 16 December, 1992, SAP has bred an import boom in luxury items and all kinds of non-essentials, dwindled investments from 12 percent to 6 percent, worsened standard of living and social conditions, deteriorated public infrastructure and prospered crooks, vagabonds and speculators. Therefore, the performance of SAP vis-à-vis development in the industrial sector or with regard to employment and trade has been disappointing. This is because SAP is basically a monetarist approach to economic management; hence demand management instruments dominate its pillars. Yet, the production structure in Africa (particularly Nigeria) is heavily import-dependent and subject to other rigidities which should invite more structuralist than monetarist strategies in the reform process. This explains why SAP has not yielded the expected results (Onwuka, 2005). From all indications, SAP was an instrument of the capitalists to perpetrate capitalism and consolidate the Third World's dependency on the developed capitalist societies. Thus, Nigeria's continued dependence on foreign supply of technology, expatriates, goods and services, has constituted serious obstacles to the nation's industrialization efforts.

In particular, privatization and commercialization policy (a cardinal pillar of SAP) was appreciated because of its capacity to reform or transform the nation's economic and industrial development problems. However, the policy

failed to achieve the desired expectations. The gory experience of the privatized NITEL is a case in point. Following the acquisition of Nigerian Telecommunication Limited (NITEL) by Transactional Corporation (Transcorp) Plc, a total of 7,200 were relieved of their appointments in a major right-sizing exercise thus reducing its workforce to 3,500. But just as those left behind were beginning to relax, the new management announced that another 1,000 workers would be relieved of their appointment by the end of February 2007 (Nkanga, 2007).

NITEL could not find the requisite funds for severance pay of its retrenched staff even by the end of January 2007. Painful enough, the retained workers of NITEL cried that they have been owed 25 months' salary as of May 2010 and pleaded with the National Assembly to intervene. Truly, the experience of NITEL workers right from the period of its sale to Transcorp in the name of privatization shows that the government contributes to the failure of privatization exercise to solve the nation's industrial problem. The current government led by President Goodluck Jonathan has privatized electricity/power. It started with change of name from NEPA to PHCN, and now it is in private hands. We are yet to ascertain the advantages of this privatization. In fact, the industrialization policies/strategies adopted by the Nigerian government in the past, contrary to their professed benefits, have brought untold hardship to the average Nigerian, promoted mass unemployment especially among the youth, enhanced corrupt practices, and increased the cost of goods and services, among other things. Therefore, against this backdrop there is need for appropriate theoretical framework and/or policies of industrial development that can enhance mass youth employment. In this case, functional technical education should be explored as an appropriate framework for rapid industrialization in Nigeria.

### *Challenges of Technical Education in Nigeria*

There are several problems bedeviling technical education and industrial developments in Nigeria. These problems have not been arrested, rather has continued to ensue industrial underdevelopment in the country. Lawal (2013) has identified factors which militate against effective technical education in Nigeria to include the following, 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, 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) lamented that though technical colleges have been established by both federal and state governments, with vocational training centers built by governments, individuals and organizations, polytechnics and similar institutions established in all states, yet there is acute shortage of technical teachers. This is because there are no commensurate incentives to attract and retain technical teachers. Poor quality of training may be attributed to lack of responsiveness of the curriculum to the changing labour market, decline in training standards, lack of maintenance of facilities and equipment, and lack of research and development, among others.

Ekpenyong (1995) argues that technical education in Nigeria is crippled by lack of funds and inadequate infrastructure. Ejike (1990) pointed 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) noted 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 that are not quite job-oriented, and teachers that are poorly remunerated or motivated. The major hinderances 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). Prior to the present dispensation, 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) averred that successive governments in Nigeria have 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 etc. One would have observed that most of our youths in recent times only engage in these skilled occupations only when they are frustrated beyond measure. Some even vow that instead of engaging in technical work or training, they would join "okada" business (and they live to this vow). Implicitly, the neglect of technical education by the government has developed in most Nigerians negative attitude towards technical education.

Problems of industrial development in Nigeria have been identified by Ndebbio (1985, 1989) to include lack of a strong industrial research capacity or base in Nigeria; little or lack of understanding of the importance of R&D by both our leaders in the public 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, unparalleled enthusiasm to circumvent the law and cheat etc; 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 on industrial development in Nigeria, as the country has remained perpetually backward in industrial development due to infrastructural problems and other challenges such as inadequate power supply, multiple taxes, harassment by officials of government agencies, inadequate power supply, insecurity and others, which are powered by corruption (Okere, 2012). It is understandable that industrial development cannot flourish in this precarious situation.

The foregoing represents a harvest of challenges. Both the independent variable (technical education) and dependent variable (industrial development) are full of intimidating challenges. We can now see why a functional industrial development is not attainable under a faulty technical education. Of course, Nigeria cannot industrialize, given the peculiar challenges facing technical education. 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) had earlier identified 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 who do not devote their full attention to their job because of their effort to supplement their earning through other unrelated economic activities.

### ***Technical Education and Industrial Development: The Nigerian Experience***

The role of technical education is seen in producing graduates in design, construction and operation of industries, which include oil, agriculture, forestry, petro-chemicals, mineral and water resources, electrical power generation and distribution, textile, iron and steel, automotive and plastics. Also, health technology, environmental designs, armaments and commercial enterprises are evidences of the 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. In the United States of America, for instance, the centrality of vocational/technical education in the economic growth is irrefutable. Gutek (1983) maintained 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, and "throughout the twentieth century, vocational education received additional funding" (Gutek, 1983: 91).

Vocational and technical schools were federally funded because as McKenzie (1983) observed, the U.S business sector and industries persistently complained that "schools let students graduate who lack not only necessary general skills, but also specific skills for employment," an observation that accurately reflects Nigerian predicament.

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 pay 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 +". This is because these developed societies know too well that development comes through acquiring technical and scientific skills, and technical education is one sure way to that. 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. In fact, Nigeria is paying for her neglect of technical education, as unemployment, poverty and crime increase in an alarming rate.

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 this country 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 vocational education and training (TVET) was overcome by making basic workshop subjects such as metalwork, woodwork, technical drawing and basic electricity compulsory at secondary level. "Top of the Trade" television competitions and "Apprenticeship of the Year" awards were also used to create interest and promote the importance of technical skills among the youth. Since industries as potential employers have much to contribute in defining skills competencies, standards and values required, they 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. Soon after independence in 1945, S. Korea re-organized its school curriculum and emphasized science and technical education. 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). South Korea's functional educational system never allowed loss of talents.

The relationship between technical education and industrial development is two-way approach. Whereas technical education propels industrialisation and promotes the development of the capacity to manufacture goods, particularly capital goods, industrial development in turn provides the impetus for technical education and technological development/innovation (Gapanski, 1996). A major prerequisite for this transformation is the acquisition of technological capacity, the ability to select, diffuse, develop or adapt technology and build on imported technology. Countries that have experienced rapid growth in recent times (notably Singapore, Korea and Taiwan) have adopted the strategy of importing and building on established technology from abroad (Westphal, Kim & Dalman, 1985; Oyelaran-Oyeyinka, Laditan & Esubiyi, 1996; Afonja, 2003; Haruna, 2012). Technical education and training can start from locally and then advance to import and build on established foreign technology.

Industrialization in Africa has been largely as a result of import substitution strategy. Prior to industrialization the trade in most countries was dominated by multi-national companies. Many of these companies eventually imported technology for local production of their main lines, taking advantage of cheap labour. 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 & Mytelka, 1994). Unfortunately, public funded projects do suffer from technical partner syndrome (Akamatsu, 1962; Herrick & Kindleberger, 1984).

One of the first steps in starting most public project is the appointment of a technical partner who selects the technology and equipment. Quite often the selected partner lacks competency and sub-contracts the project to third parties. These 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 reason why most projects failed in Nigeria. Hopefully, technical education is capable of equipping the indigenes with the required knowledge and skills to develop their technology and industries.

By contrast, India at the initial state of industrial development relied heavily on the purchase of franchise of well-established technologies. The technical skills gained in operating these franchises eventually led to the development of local capability to manufacture similar products locally and today, India is a major exporter of technology, particularly industrial machinery (machine tools, electric motors, diesel engines, high technology furnaces, etc). The point here is that technical progress is a vital requirement for sustainable industrialisation. However, the type of industrial growth which has taken place in Nigeria has failed to stimulate technical progress (Chenery, 1960; Oyelaran-Oycyinka, 1997).

Despite the fact that most of the countries in the sub-region spend substantial proportions of their annual budgets importing technology and its products, there has been little progress in the acquisition of technological capability (World Bank, 1999). 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. Quite often, the problem 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.

### **Conclusion**

The review that has been so far presented in the paper 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 implication 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. 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 and 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. 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.

### **Recommendations**

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 in Nigeria 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.

**Adequate Funding:** Generally, the education sector is poorly funded in Nigeria. From primary to tertiary institutions, workers are not adequately remunerated; research and development (R&D) is poorly funded; and learning facilities are either obsolete or inadequate. In some cases, teachers/lecturers do not have offices, and they are only paid stipends that do not motivate them to put in their best. In fact, funding of education in Nigeria is not impressive, as the government has failed to abide by the internationally-approved 26% budgetary provision for education. Countries that have complied with this international provision are reaping the benefits today. For instance, India invested over three billion dollars in 1985 in some 1,300 research institutes working on electronics aeronautics and space, atomic energy, among others. In the same year, she spent 1.5% of her GNP on research and development compared with about 2.5% spent by the U.S. Nigeria's highest allocation figure was 0.43% in 1983, which went down to 0.05% in 1992 and 0.23% in 2003 (*The Nigerian Engineer*, Vol. 35 No. 4 December 2003).

It is obvious that the level of industrial and technological development in India and the U.S. is far above what we have in Nigeria. Something serious has to be done about the Nigerian situation. It is pertinent to note that government at all levels must be pressured to devote the recommended 26% of their budgets to education. Out of this, at least about 50% should be allocated to technical education representing roughly 10% of the total budgets. 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).

**Provisions of Adequate Facilities:** According to Ojimba (2013), most technical education departments in Nigerian universities do not have laboratories or workshops space let alone functional 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) had posited that most technical education departments still depend on engineering workshops and lecturers to teach technical education concepts in this 21<sup>st</sup> century. The bottom line is that facilities and equipment should be adequately provided in technical institutions and higher institutions of learning. Also, regular maintenance of the facilities and equipment should also be ensured.

**Manpower Training:** Adequate manpower training is a panacea to improving technical education and industrial development. Primary/secondary school

teachers, polytechnic/university lecturers and other technical experts should be adequately trained to impart technical knowledge and skills that can drive the desired industrial development. 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 enough staff should be engaged in schools at all levels.

***Steady Energy Production and Supply:*** Lawal (2013) has advocated for 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 yet fails to supply adequate power is ignominious. Of course, industrial development in Nigeria can be achieved through steady and sustainable supply of electricity. Now that the power sector has been privatized, attempts should be geared towards constant supply of power/electricity. 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.

***Stopping 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. University graduates (B.Sc or B.A. holders) are placed and paid higher than their polytechnic counterparts (HND holders) in the civil service, education sector and banking sector, among others. This discrimination for whatever reason is senseless and should be stopped. 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 parity in recruitment and career progression for both HND and B.Sc/B.A. degree holders.

Technicians and all who pass through technical-oriented schools ought to be adequately and equitably remunerated. The dichotomy in the civil service between holders of "General Studies" certificates and technical certificates must not only be abolished as a matter of policy but in the thinking and attitude of government officials. The truth of the matter is that technicians or technologists are not inferior to their counterparts. It is a matter of career choice and we should make this very clear to our children right from the primary schools (Ojimba, 2013). Syllabuses need to be re-innovated and re-designed to include disciplines that have technical appeal.

***Re-designing of the Curriculum of Technical Education:*** 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 overloaded 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.

**Application of 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 (FIRO) 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. Universities and polytechnics have also invented different equipment, which nobody has bothered to apply them 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.

**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 in the country, but more often good leaders or managers are not brought into the picture to initiate and execute the policies. The writings of Koontz (2002) better explains the import of good leadership, "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, programs and projects concerning technical education and industrial development; and also fight corruption in all sectors of our national life to a standstill.



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