

# The Role of University-Industry Linkage in Creating a Functional Technical and Vocational Education and Training (TVET) in Nigeria

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## ABSTRACT

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This study was on the role of university-industry linkage in creating a functional technical and vocational education and training (TVET) in Nigeria. The study specifically looked into the concept of TVET, types of university-industry linkage, reasons for university-industry linkage, current status of university-industry linkage, challenges mitigating university-industry linkage, strategies for effective university-industry linkage in the universities and the role of viable university-industry linkage in creating a functional technical and vocational education and training. It was noted that in order to build a viable linkage between the universities and the industries, legislators at both federal and state levels need to come up with laws and policies that will foster university-industry linkage with clear implementation strategies, compulsory periodic internship for both lecturers and students, integration of professionals from the industries in the TVET curricula planning and implementation processes. It was concluded that when a strong linkage is established between the universities and industries, TVET will receive the dividends and as such be made functional and effective.

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## **Introduction**

In recent time, there has been emphasis on the shift from resource based economy to knowledge based economy in developing countries such as Nigeria. Knowledge based economy is a kind of economy that is knowledge-driven. Knowledge is a pivotal driver of economic growth and development in a country. Highly technologically developed countries in the world invest so much in technological innovation through academia-industry collaboration. Several inventions in the industry drew from academic researches and consequent fundamental innovations in the various higher institutions. For instance, Obanor and Kwasi-Effah (2012) observed that the new networking concepts in electronics and communication provided the framework for the internet world wide web and ecommerce. Skills and knowledge transfer between industry and university come in different ways such as direct hires of students, graduates, temporary exchanges of researchers, university/faculty consultancies, joint research involving industry and academia, industry-sponsored research, contracts and grants, a variety of institutional mechanisms at universities (e.g., research centers, consortia, and industrial liaison programs), publications, conferences, and short courses (Murray & O'Mahony in Obanor, & Kwasi-Effah, 2013). It is important to note that, a country can only be technologically developed and innovative to the extent of her technology transfer between its local university and industry. Nigeria industries may be perceived to constitute a major source of internal brain drain by demanding so little of her workforce from graduates of indigenous universities. This is because technology is only transferred from developed countries and not necessarily from our indigenous universities. This situation has a far reaching implication for Technical and Vocational Education and Training (TVET) institutions as well as the industry.

Technical and Vocational Education and Training (TVET) is a trade-based education that is viable enough to curb the menace of unemployment and create wealth. As a skill-based discipline, Technical and Vocational Education and Training is designed to equip those who are trained thereby to possess certain skills and attitudes that give them leverage of employment and self-reliance in the world of work (Agbo, 2019). However, this lofty goal has remained a mirage. The questionable quality of graduates from Nigeria institutions of higher learning has been a serious concern to employers of labour, as little or no value is placed on the skills and attitudes possessed by these graduates. The result is that multinational and indigenous industries in Nigeria prefer hiring expatriates to that of the graduates of the Nigeria higher institutions. In cases where these industries hires the graduates of the Nigeria institution, they are often sent for retraining due to lack of requisite skills and attitudes required to fit into the work environment. Trainings and retraining of this nature is usually capital intensive. Hence the preference for expatriates and graduates from foreign universities whose skills are found compatible with the skills needed in such industries. This

lacuna is the major cause of unemployment among TVET graduates in Nigeria.

Technical and Vocational Education and Training (TVET) was introduced majorly to address unemployment. TVET is meant to equip learners with skills, knowledge and to enable them become productive members of the society and the world of work upon graduation. To achieve this, the training environment must be comparable to the work environment the learners will work upon graduation (Prosser & Allen, 1925). However, Agbo (2016) opined that the training institutions have failed to comply with this popular vocational education theory. This has a grave implication for the industry since skilled personnel trained and nurtured by the TVET institutions are meant to feed the various industries in Nigeria among others.

In Nigeria today, available records show that there is critically weak or no linkage between TVET institutions and industries. The result of this is the obvious differentials between the skills needed in industries and the skills taught in TVET institutions. It is against this backdrop that the Federal Government of Nigeria saddled the Industrial Training Fund (ITF) with the responsibility of establishing and running Students Industrial Work Experience Scheme, SIWES (Aroge, 2012). The SIWES is meant to provide opportunity to students of TVET institutions and other related disciplines to acquire certain vital skills in the industry to match the discrepancies between classroom experiences and the world of work. However, what appears unfortunate is that currently SIWES has turned to become a mere routine in Nigeria. The difficulty students' encounter continually in securing placement for their SIWES is very disheartening. The effect is that so many students secure placement in industries that has little or no relationship to their discipline. They end up getting no relevant experience that could make them self-reliant upon graduation (Okoye & Agbo, 2016). It is against this background that this paper seeks to project the pivotal place of university-industry linkage in creating a functional Technical and Vocational Education and Training as well as preferring a practicable model for implementation.

### **Concept of TVET**

TVET is perceived as that part of education in addition to general education that equips an individual or a group of persons with requisite skills, attitudes and knowledge for employment or self-reliance in a specific occupation. Therefore, self-reliance and gainful employment into a specific occupation is the thrust of TVET. TVET empowers individuals to develop their creative and manipulative potentials for the benefit of humanity. Thus, Technical and Vocational Education and Training (TVET) is that aspect of education that exposes the learner to acquisition of demonstrable skills that could be transformed into economic benefits (Akerle, 2007). Dawodu (2006) perceived Technical and Vocational Education and Training as the most reliable vehicle for self-sustenance, economic prosperity and political supremacy of a nation over others. In this regard, there is an

apparent recognition that equipping of individuals for self-sustenance is an integral focus of TVET at all levels. TVET is also viewed by the Federal Government of Nigeria (2014) as a comprehensive term referring to those aspects of the educational process which involves, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understandings, and knowledge relating to occupations in various sectors of economic life.

These perceptions and renderings suggest that Nigeria as a nation and her government understand TVET as consisting of the acquisition of practical skills, attitudes and knowledge. These qualities are key to achieving self-reliance and employability. Hence, Nigeria is not ignorant of the potency of a well-structured TVET program. This is evident when one examines the objectives of TVET as enshrined in the Federal Republic of Nigeria (FRN) policy on education from the first edition (published 1977) to the present (6th edition published 2014). A close look at the different reviews of the policy reveal that these goals have remained almost the same. Although the goals meted out for TVET to achieve is laudable and high sounding, one wonders if merely setting a goal is tantamount to achieving it.

These laudable goals reveal that the Nigeria society is not unaware of the potency of TVET to cause an all-round industrial and economic revolution if accorded the required attention. One of the major thrust of TVET as enshrined in the national policy on education is to provide the technical knowledge and skills necessary for agricultural, industrial, commercial, and economic development of Nigeria. This means that industry is in the heart of TVET. A functional TVET is one that is achieving these set goals. Therefore, any TVET programme is adjudged to be dysfunctional and ineffective when these goals are not achieved. To create a functional TVET programme that is delivering these dividends to the society, there must be a viable linkage between the TVET institutions at various levels of sophistication and the industry.

## **Method**

### **Types of University-industry Linkage**

Seppo and Lilles in Emeasoba (2017) identified four types of university-industry relationships:

- Research support: This embodies financial and equipment contributions made to universities by industry. These contributions can be unrestricted gifts of endowment trust funds that the university uses to upgrade laboratories, provide fellowships to students, or provide seed money for promising new projects.
- Cooperative research: This includes contract research with individual investigators, consulting by faculty, and certain group arrangements specifically for addressing immediate industry problems. In the case of individual investigators or a consultancy there is usually only one

faculty member involved who is working with a single firm on a targeted research project. Group arrangements involve more than just one faculty member and more than just one industrial firm.

- Knowledge transfer: This encompasses highly interactive activities that include on-going formal and informal personal interactions, cooperative education, curriculum development, and personnel exchanges. Knowledge transfer mechanisms are the recruitment of recent university graduates and employing student interns, co-authoring of research papers by university and industrial firm members, industry-university consortia and, for example, also trade associations.
- Technology transfer: This also involves highly interactive activities. Compared to knowledge transfer the focus here is on addressing immediate and more specific industry issues. In technology transfer the university-driven research and industry expertise make complementary contributions into commercialized technologies needed by market. Often the university provides basic and technical knowledge along with technology patent or licensing services. Industry members provide knowledge in a specific applied area along with a clear problem statement related to market demand. Technology transfer takes place through technological consulting arrangements, the firm's use of university's extension services, jointly owned or operated ventures.

Ali-Asghar in Nnaji (2015) identified four major models of school-industry linkage mechanisms.

They are:

- The teacher focused model: this involves increasing the teachers' knowledge about the world of work. This is to enable the teachers to impart marketable knowledge and skills into their students rather than obsolete ones. This could be seen as a means of ensuring that teachers are constantly upgrading as the system evolves.
- Students focused model: In this model, the aim of the linkage is to provide a platform for the students to be abreast with the real world work environment. This helps to bridge the gap between theory and practice.
- Curriculum focused model: Making the TVET curriculum relevant to the needs of the industry is the goal.
- Market focused model: In this model, the training market is seen as a mechanism for creating relationship between training and work.

## **Result and Discussion**

### **Reasons for University-industry Linkage**

As earlier stated, a country can only be technologically developed and innovative to the extent of her technology transfer between its local university and industry. TVET institutions, by their very nature, are meant to be grounds for experimentation and knowledge production for development.

On the other hand, the industry, exist to put to work, ideas and principles founded on sound theoretical frameworks. TVET institutions serve as inspiration and solution centers for growth and development. Specifically, some of the reasons for TVET institutions-industry linkage are briefly discussed below:

- **Divergent research interest and focus:** There is no doubt that there is a culture differential in terms of research and development between industry and TVET institutions. The industry carry out research to solve real issues to enable her increase productivity and earn the confidence of consumers of her products. Sadly, in TVET institutions, the story is different. In many TVET institutions, most academic researches and developments are mere academic exercise as they have little or no practical relevance to the industry. This will go on alarmingly unchecked if partnership between TVET institutions and the industry is not attended to. Ideally, the institutions should be a sacred temple of experimentation and knowledge production for development whereas the industry exist to put to work, ideas founded on sound theoretical frameworks in the institutions (Ayobami, 2018).
- **Funding:** Establishing and running any TVET institution is capital intensive. Poor funding of TVET institutions, no doubt, has contributed bulkily to the dearth of TVET institutions and consequently her poor products. No TVET institution can be sufficiently self-funded. Over time, government has treated funding of education with kid gloves. While we must keep agitating and pressing hard on the government for increased funding of education, we must explore other funding channels. Hence the help of private and public sector investors is required for TVET institutions to be adequately funded. This cannot be achieved in a vacuum. Investors put in their limited resources into things that has promising return on investment. This can only be realized in an atmosphere of viable synergy between the TVET institutions and the industry.
- **Technology transfer:** Technology transfer between industry and TVET institutions come in different shades such as direct hires of students, graduates, temporary exchanges of researchers, university/faculty consultancies, joint research involving industry and academia, industry-sponsored research, contracts and grants, a variety of institutional mechanisms at universities (e.g., research centers, consortia, and industrial liaison programs), publications, conferences, and short courses (Murray & O'Mahony in Obanor, & Kwasi-Effah, 2013). The institutions and the industry can only leverage on these facets and features of technology transfer when there is a strong synergy built.
- **Inclusiveness in Curricular Planning and Implementation:** It is believed that the graduates of our TVET institutions lack requisite skills for self-reliance and employment in the industry. This anomaly is partly blamed on the lack of inclusiveness of the curriculum used in many

universities which includes TVET institutions (Segun, Azuh & Olanrewaju, 2015). Since the industry is expected to absorb the products of these institutions upon graduation, it is economically wise to involve the industry in the planning and implementation of TVET curriculum at various levels. This will ensure that the interest of the industries in terms of practical relevance of school training forms part of the training. When there is no strong linkage between the TVET institutions and the industry, the institutions will keep running a curriculum that will not sufficiently equip the graduates with skills, knowledge and attitude needed for employment in the industry or self-reliance.

### **Current Status of University-industry Linkage in Nigeria**

A cursory look at the status of linkage between the industry and academia in Nigeria reveals that it is either not existing or very weak where it exist. At the heart of the rot that currently ails the nation's universities is the embarrassing gulf between our tertiary institutions and the organized corporate sector (Ayobami, 2018). Ayobami further argues that ordinarily, the fact that the university trains the workforce for the industry should naturally propel a symbiotic relationship between the two, but that is not the case in Nigeria, sadly.

Due to the culture differentials between the university and the industry, there are two faces to the status of university-industry linkage in Nigeria. Hence the need to discuss this from the perception of the industry as well as that of the university. Obanor and Kwasi-Effah (2013) conducted an assessment of university-industry linkage and technology transfer. Their discoveries are thus:

- As seen from the side of the university: It was found that, collaboration between university and Industry is mostly by individual effort. However, some academics work hard towards bridging this gap. This has resulted in weak collaboration since this act is informal. Most Academics are driven by their conferences, technical journals and their need to publish and less driven by how technology can be effectively transferred through effective collaboration. In the aspect of industrial conference attendance which is a means of technology transfer, it was found out that academics seldom attend as they feel it is below their standard. However, academics also claim that they are not well informed about any scheduled conferences if at all there is any. This has also contributed to the unawareness of the academics about problems faced in the industry, hence slowing the rate of technological innovations. It was also found that academics distrust industrial managers, whom they believe want to exploit them to achieve their business goals.
- As seen from the side of the industry: From the industrial point of view, collaboration is mainly by individual effort. This is synonymous to the university's experiences. Industrialists are driven by their vendors and the IT media (newspapers and magazines) and less concerned about the

incubating technology in the academia. Their participation in academic conferences has not been encouraging. This has contributed to the lack of awareness concerning the mutual benefit of collaboration. The industry feels that there is little it can learn from the academia especially in the field of maintenance and reengineering. Industrial personnel do not often access academic journals also, some industrialist are not concerned about what academics have to offer. Industrial managers distrust academics, they believe they only want to experiment at their expense.

These are the current situation that co-exist in both sectors. From the foregoing also, it can be deduced that both the industry and the university strongly agree that both are operationally, they are living in different world. Thus we may affirm that the individual attitude has a great role to play in bridging the gap.

### **Challenges Mitigating University-Industry Linkage in Nigeria**

There are several factors that downplays university-industry linkage. They are:

1. Negligence of indigenous experts by the industry: Most industries in Nigeria lack confidence in the capacity of indigenously trained workforce. As a result they rarely employ indigenously trained experts to be part of their workforce. This is a bane of morale in the part of the academics as well as their products. It is common thing in Nigeria to see industries hiring expatriates to do jobs that indigenously trained workforce can do better and at a cheaper premium.
2. Public value and perception system: It's no doubt that in Nigeria today, the public view any product imported as superior to the locally produced products. This stigma of "made in Nigeria" translates to workforce too. Most Nigerians will most likely patronize industries that in which expatriates forms major part of their workforce. For instance, any electrical installation firm in which expatriates constitute their workforce will always get more contracts than their counterparts which hires locally trained workforce. Since every firm is set out for gain, there is mad rush for foreigners as workers even they will have to pay more. This they do just to gain public confidence. One wonders whether quality is tied to foreigner.
3. Culture differential between the university and industry: The universities often time prioritize long-term collaboration whereas the industry is concerned about meeting immediate needs. This difference in culture has a dire implication for partnership between the duos. There is need to establish a common ground wherein both players in the partnership benefit. It will be difficult to entrench synergy in the operations of both the universities and the industries if there is no common ground for it to subsist.
4. Lack of confidence in the universities: Most industries do not have confidence in the universities to proffer solution to issues bugging their operations. Major contributor to this lack of



confidence is traceable to the manner in which universities operate. For instance, in most universities, there are inadequate facilities, and where they exist such facilities are obsolete and inefficient to conduct or correlate research / curricula to meet the industrial needs of the country. Every party in any collaboration looks for benefits in the partnership. Hence there must be a framework that assures both parties the essence and benefits from such collaboration.

5. Policy gap: There is gross lack of government policies on University-Industry linkages. If such policies and their implementation strategies are in place, it will foster linkage between universities and industries.
6. Sustainability and management tenureship: Where there is no robust and rigid framework to cater for sustenance of university-industry linkage, the case will always be that any existing linkage will be cancelled when there is a change of management, the memorandum of understanding establishing such linkage does not go well with new management.
7. Corruption and poor leadership: It is no gainsaying to opine that corruption and poor leadership are monstrous challenges in the public domain. Public office holders often misappropriate public funds for personal gains. The universities are not left out in this mess. No industry will sustain a healthy partnership with any university whose leadership are in the practice of embezzlement and lacks the will to provide desired feedback and vice versa. Measures to curb corruptions in the universities and industries is crucial for viable academia-industry partnership.
8. Funding issue: Many universities lack adequate funds to support research processes and provide state of the art facilities. In such situation, the universities will run short of her expectations thereby weakening the trust bestowed on her by the industry.

#### Strategies for Effective University-Industry Linkage in Nigeria Universities

The following strategies are proposed by the researchers as means to reviving and sustaining a viable academia-industrial linkages in Nigeria:

1. Scholar-practitioner approach: To win the trust of the industries and organized private sectors, the universities need to balance the undue tilt of emphasis on theory with practice. This can be achieved through building synergies with professional organizations. The goal of this is the absorption of informed professional perspectives that can readily promote integrative and blended learning. There is nothing wrong in appointing professionals who have distinguished themselves and have impacted the field of practice in significant ways. This model certainly promises to help the universities negotiate a radical departure from the theory-suffused model currently prevalent in our institutions.
2. Alternative funding model: There is no doubt that a key factor that has kept our universities

manifestly deficient, is the poor funding. A visit to any of our institutions, especially public universities, is bound to leave any visitor stunned and disappointed, considering the profile of dilapidated structures, acutely obsolete laboratories and decrepit facilities that litter the campuses. While we must insist that it is right and necessary to demand that government increase her funding of education in the country, it is also wise that we consider additional funding model. In this regard, the linkage between the town and the university becomes critical. Like it exists elsewhere, the industry should reconsider how to support tertiary institutions in the country to deliver on the mandates of engaging in relevant, purposeful, qualitative research and the production of adequately trained workforce to support (Ayobami, 2018). The universities, to achieve this, must begin to deliver values that meet the immediate needs of the industries. For instance, through focused funding of key research areas of immediate relevance to societal development, organizations and indeed privileged members of the society can support scholars and research in targeted areas. This way, the interest and financial commitment of the industries and privileged individuals will be attracted. Ultimately, it is a win-win situation, if this happens.

3. Curricula perspective: The universities is believed to be a major feeder of the industries in terms of workforce. It is therefore important to integrate the industries in the curricula planning and implementation processes. This will ensure that the products of the universities easily fit into the industries with little or no training. This model will also help to ensure compliance to one of the theories of technical and vocational education and training by Prosser which says that training environment should be comparable to the environment the individual will work upon graduation.
4. Professional internship model: There should be a workable framework for the key players, such as lecturers and students, in the academia to go for periodic internship in the industries. The current framework in which the students embark on six months students industrial work experience scheme (SIWES) has a weak support structure (Ayonmike, 2014). The current SIWES structure is such that most students end up attaching themselves with firms that has nothing to do with their discipline. Some students do not partake in the SIWES due to the frustration of getting a firm for the work experience. On the other hand, there is currently no structure in which academics are compelled to undergo a compulsory professional internship in the industries. On this note, a structure that compels both lectures and students to undergo a well-organized and monitored periodic internship must be in place. This, if not addressed, will keep widening the experience and knowledge dichotomy between products of the universities and industry.

5. Policy model: The legislators at both federal and state levels need to come up with laws and policies that will foster university-industry linkage with clear implementation strategies. The industries have respect for the law of the state and so will be compelled by such policies to partner with the universities. Universities, on the other hand, will also have no choice but to respect the law. This will provide a formal and legal framework for all forms of linkages between the industries and the universities.
6. Management tenureship: In order to absolve the negative consequences that change of leadership pose to academia-industry linkage, there should be stringent measures that ensures such partnership is not tenure-based. Stringent sanctions need to be clearly stated, in the memorandum of understanding at the onset, for both partners in the event one decides to discontinue the partnership. This way, change of leadership of both partners will have little or no negative effect on the linkage.

#### The Role of Viable University-Industry Linkage in Creating a Functional TVET

A functional TVET is simply a TVET system that produces graduates that are self-reliant and as well possess high level of employable skills. The creation of TVET system of this ranking is tasking and as such requires active involvement of major stakeholders. The industries has critical roles to play in creating such a functional TVET system in terms of access to practical experience, funding, curriculum development process and implementation among others.

TVET is a practical oriented program/training. Most TVET institutions do not have all the wherewithal to proffer tools, machines and expertise required for equipping the students with skills needed for self-reliance and employment upon graduation. Hence industries need to assist as much as possible. Most practical experiences which the students cannot access within the four walls of the school should be available in the industries. Where there is a viable synergy, students and lecturers can readily have access to such practical experiences.

It is no more news that TVET requires huge fund for mounting and sustenance as well. Such huge capital is not always available as government do not always provide all the funds. Since these TVET institutions are major feeders to the industries in terms of workforce, industries will be called upon to invest in the institution where there is a viable partnership. In most developed countries, this understanding underpins major strides in the TVET revolution which consequently leads to industrial boom.

Technology is evolving daily and as result, the operations of the industries evolves as well. Where the industries are left out of the curriculum development and implementation, may be as a result of good collaboration, the TVET institutions will operate a rigid curriculum that will produce graduates who will alien to the operations in the world of work. This scenario creates a mismatch

between the school curricula and the need of the industries. Consequently, most graduates of TVET institutions lack employable skills and cannot be self-reliant (Segun, Azuh & Olanrewaju, 2015). Apart from the students, lecturers also need to upgrade their skills and knowledge as earlier suggested. Hence a viable academia-industry synergy will ensure that curriculum development and implementation evolve as technology evolves. This way, lack of employability skills and self-reliance will become issues of the past.

### **Conclusion**

At the heart of the rot that currently ails Nigerian universities is the embarrassing gulf between our tertiary institutions and the industries or the organized corporate sector. This has a far-reaching implication for the industry, universities and the nation's economy at large. Specifically, factors such as poor funding, culture differential between the universities and industries, corruption and poor leadership, policy shortfalls among others, mitigates linkage between the universities and the industries. To ameliorate the situation and ensure viable linkage between the universities and the industries, the researchers proposed, among others, that legislators at both federal and state levels need to come up with laws and policies that will foster university-industry linkage with clear implementation strategies, compulsory periodic internship for both lecturers and students, integration of professionals from the industries in the curricula planning and implementation processes. These strategies, if implemented, will help to build academia-industry linkage that is viable enough to correct the knowledge and experience gulf between the industry and universities. This way, TVET will be revitalized in the various universities.

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