



Re-Engineering Social Perception of Industrial Technology Education as a Critical Tool for Technological Advancement in Africa

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ABSTRACT

The recent past has been characterised with several national/international discourse on strengthening industrial technology education (ITE) for sustainable national development and better quality livelihood. The renewed focus stems from the widely accepted UNESCO definition of ITE to include the study of technologies and related sciences, and their attested importance in attaining national development. No doubt, technologies and related sciences include Science Laboratory Technology, Industrial Physics and other Applied Science Disciplines. Though reports abound on the important roles of ITE in attaining innovative national development, other reports also indicate ITE and related programmes/technologies are not esteemed as preferred course of study in Africa, particularly Nigeria. The situation is widely noted to result largely from low social perception of ITE programmes. This paper finds this debased perception very worrisome in this age of interdisciplinary/collaborative studies and application of technical-know-how in industrial/scholarly activities. Following strong suggestions that 'perceptions' are critical factors in fostering and sustaining, or deterring any pursuit, a systematic narrative exploration and literature analysis were used to argue that with a continual debased societal perception of the said programmes, efforts at gaining sustainable national development through ITE and related applied sciences would hardly yield desired objectives. The paper concludes that unless there are equal determinations at social re-engineering by way of reorientation, campaigns and national policy formulations/implementation, to correct the said misconceptions and to foster transformation of the society into one where ITE programmes and its recipients are highly recognized, accepted and well remunerated, the desired national development will remain elusive.

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INTRODUCTION

Half a century ago, Aliyu Babatunde Fafunwa - a sagacious Nigerian education scholar of international repute, and a onetime Minister of Education and Youth Development in the country, summarily depicted societal perception of occupational/technology training in these locutions; "vocational education is urgently needed for our development and should be encouraged, but not for my son" (Fafunwa, in Okocha, 2009: p. 88). In the same regard, Zeleke (2018) and Allais (2020a), affirmed Fafunwa's submission as a norm. In

fact, results from past studies, which are yet to be refuted, indicate that even industrial technology education (ITE) teachers would not want their children to study ITE programmes. For example, Anamuah-Mensah in Amedorme and Fiagbe (2013) reported none of all 87 ITE instructors in a public survey wanted their children to study ITE programmes, though some of the said programmes are accorded professional status in both the industry and civil service. Several years after, Anamuah-Mensah's finding in Amedorme and Fiagbe is yet to be refuted. In the same vein, the low



societal perception of ITE and related applied sciences across many developing climes has not abated.

Accordingly, the above referenced reports suggest that the negative disposition of individuals towards ITE, especially in unindustrialized societies, is inherent in the social context of the society. This is in spite of the fact that many developing nations, especially those of Africa, have very good policy statements about ITE. For example, the Federal Republic of Nigeria National Policy on Education (FRN, 2013), states that ITE or TVET is used as a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life (p. 24)

The above government deposition notwithstanding, a debased social perception of ITE still pervade most developing societies. Unfortunately, besides documentation and rhetoric, most governments of developing societies especially those of Africa, government parastatal organizations and non-governmental organizations do not seem to perceive otherwise in practice. In their quest to attain sustainable national development and better-quality livelihood for their citizens, these nations appear to be at a crossroad what to do with, or how to utilize ITE to attain developmental goals. According to Azeem and Omar (2019), ITE is also known as, and used interchangeably with career-technical education (CTE), technical and vocational education training (TVET), and referred to as occupational/professional education in all its ramifications and forms. This paper believes that the said ramifications and forms include, as inferred in FRN (2013), related applied sciences such as Science Laboratory Technology, Industrial Physics, Industrial Chemistry, Industrial Microbiology, Industrial Biotechnology/Biochemistry and Technical/Vocational Training. In fact, it is averred that ITE and its related applied sciences are arrays of training in practical skills acquisition, and up-skilling in a variety of situations, including educational institutions and

the workplace, however, with a common factor of the acquired hard and soft skills being relevant to the world work (Oketch, 2007; Kanwar, Balasubramanian & Carr, 2019; Van der Bijl, & Taylor, 2016).

Furthermore, Rusli, Zulkifli, bin Saad and Yussop (2019) agrees with the definition of TVET in the National Policy of Education of Federal Republic of Nigeria (FRN, 2013). The inference of the policy definition of TVET or ITE is that it include the study of several aspects of technology, the practical application of sciences to resolving societal challenges using acquired professional attitudes, understanding, skills and knowledge in the different areas of economic and social life. The above definitions aligns with the description of ITE as adopted by the International Labour Organization (ILO, 2011) and the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2004). Beside the aligned descriptions, there are very few evidences of studies targeted specifically at exploring means of changing societal perception of TVET so as to increase its social acceptability. More precisely, Rusli, Zulkifli, bin Saad, and Yussop observed UNESCO defined ITE to include every "aspects of the educational process involving, in addition to the general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupants in various sectors of economic and social life" (p. 91).

The above definition ordinarily depicts the description of a programme of study that develops enrolees and prepare them with requisite theoretical background and practical competences to enter, occupy and to take up productive career in several sector of socio-economic endeavour. However, there is no gainsaying that scholarship in technology and allied science disciplines together with the attainment of functional technological expertise is key to societal growth and sustainability. In this regard, it is argued that recent developments shows that knowledge and skills have become more acceptable terms in economically more developed nations (Ikenga, 2022; Kanwar, Balasubramanian & Carr, 2019).

Furthermore, it is established that science and technology have much to contribute towards attaining sustainable development and that the ability to generate and



use technology is increasingly a key economic factor in today's world (Berawi, 2019; Independent Group of Scientists, 2019; UN CEPAL SERIES, 2003). Furthermore, it is noted that in boosting growth/economic competitiveness, it is necessary to reinforce scientific/technological capacity while redirecting efforts towards the generation of a new scientific/technological capacity; and that beyond rhetoric, it is necessary to implement effective measures at making human resources training among other factors, conducive to the understanding and resolution of sustainable development. The implication of this report is that TVET is very much critical to the pursuit of sustainable development.

In the past decade, ITE has been on the front burner of several national and international discourse. It is being continuously projected as a route to fast track industrialization and sustainable development especially in developing African nations like Nigeria; promote entrepreneurship; tackle unemployment, and by implication poverty; and of course as one veritable means of achieving the millennium development goal of quality and sustainable livelihood. The projection and pursuit of TVET by many nations in this millennium is no doubt due to a better appreciation of the potentials of ITE in achieving sustainable development and better quality livelihood. Without a doubt, there could be no means of systematically and scientifically transferring and acquiring the requisite skills to generate and use technology, nor other pathway to generate new scientific and technological capacity amongst the workforce (including those in established positions, the unemployed and those still in training/school) without ITE. That being the case, it is a wonder for anyone or group to jettison an acclaimed tested and established solution to issues posing obstacles to their progressive development and sustainable wellbeing, while paying lip service in extolling the said tested solution. More worrisome in this regard is for a nation, especially a developing nation not to pursue with unrelenting vigour and concerted doggedness the formulation of policies necessary to foster the enabling environment, and implementation of programmes that have been so appreciated among the committee of

nations as being sacrosanct for national development and sustainable livelihood.

The positive potentials of ITE notwithstanding, many in developing nations of Africa views it as a path with a dead-end, leading unto a career without nobility, in deed as a course or programme of study for the very less intellectually endowed i.e. the never-do-wells (Afeti, n.d.; Agbongiasede, 2012; Aldossari, 2020; Allais, 2020b; Chamadia & Shahid, 2018; Mutarubukwa & Mazana, 2017; Yusuf & Soyemi, 2012). The aforementioned situation is not at all surprising, as the status quo has remained unchanged, since TVET remain boarded on ridicule and insolence because of societal antipathy and parents' avowed disapproval of its programmes/careers for their children (Chamadia & Shahid, 2018; Mutarubukwa & Mazana, 2017; Okocha, 2009). This state of affairs truly reflects the scenario in Fafunwa's allusion. The situation typifies a clime where government, their agencies and their officials, the academia, cooperate businesses/organizations and most citizens in their individual capacities extols the virtues of ITE as an ideological pathway which societies cannot do without, and as a programme/career which is best for others within the society, but not themselves, nor for their loved ones. As a result of the negative perception of ITE, it has been stigmatized in many societies (Agbongiasede, 2012; Aldossari, 2020; Chamadia & Shahid, 2018; Mutarubukwa & Mazana, 2017, ILO, 2011; Rusli, Zulkifli, bin Saad & Yussop, 2019). The stigmatization has had its toll on the societies, even as youths generally prefer the general form of education to ITE. In Nigeria for example, the equality between holders of degrees in "general education" and holders of higher diplomas in "vocational technical/technology education (VTE) programmes," does not go beyond writings and discourses. In practice, the former is preferred over the latter; heads the latter; has an open/better career prospect than the latter; earns much more than the latter; and of course is held in higher social esteem, better appreciated and accepted by the society, even though they are constitutionally said to be equivalent (Olajuwon, Oladebeye & Sadamoro, 2020; Yusuf & Soyemi, 2012). In addition, the Nigerian society considers holders of university degrees in the various technology option of



TVET programmes as trained to function only as ITE teachers, rather than as both teachers and industrial technical/technology professionals. Implicitly, Olajuwon, Oladebeye and Sadamoro, together with Yusuf and Soyemi, suggest that the situation described above stems from the negative public views about ITE and the discriminatory disposition of the society at large towards graduates from technical schools (including those of higher education). They further implied that another causal factor is the abysmal professional regard in terms of status accorded skilled workers in the “non-elite profession”, which has also orchestrated the near total disappearance of technology/trade training centres.

In view of the aforementioned, this paper wondered,

- a) What is the implication of strengthening ITE in every respect, without a corresponding concerted effort at improving its social acceptability?
- b) In the circumstance of societal stigmatization of ITE, what could enhance the social status of ITE towards popular acceptance and involvement in developing African nations like Nigeria?

In order to ensure better acceptability of ITE especially in developing societies, proffering answers to these queries becomes very crucial. Nevertheless, not before a brief discuss of cross-societal status of TVET.

CROSS-SOCIETAL STATUS OF ITE

The social status of TVET in different societies, is a key determinant factor to the social acceptability or otherwise of ITE in those societies. Though many advance nations and international organizations have continually hammered on the very important role of TVET not just in fostering the individual development of enrollees, but more so, in fostering sustainable national development, that is not the case with some others, especially developing nations. Historically, Byrkjeflot (2000) submitted that while ITE was primarily part of the driving force for technik and manufacturing development, as well as for social and national unity in Germany, engineering education was deliberately implemented as the intersect for industrial

training and liberal education. Furthermore, Byrkjeflot traced career and industrial training in America to around 1860 when American educators took a cue from the German technical education model, and to around 1925, when American career training system became mainly comprise of engineering schools, noting that the schools were generally enmeshed in the traditional university system even at that time.

Implicitly, ITE is not only esteemed and given a high sense of value in developed climes, its implementation is regularly a front burner discuss with recommendations for its implementation (Kravchenko, et al., 2020; Tryus & Herasymenko, 2021). Furthermore, the United State Department of Education (USDoE) described the CTE system as being pivotal in rebuilding their economy and securing a brighter future through its provisioning of high-quality job-training opportunities that will reduce skills shortages, spur business growth, encourage new investment and hiring, spark innovation, and promote continued economic growth (USDoE, 2012). Irrespective of the viewpoint of Byrkjeflot, one undeniable inferential summation is that industrialization and sustainable development would not have been achievable in Germany and US without ITE. Whereas Germany used TVET as an instrument to mobilize her populace towards acquisition of functional industrial technical skills necessary for industrial growth, social unity, and nationalism, US founded her engineering colleges on the philosophies and ideals of technical education, integrating it into the traditional university system. Although, there are reports that in the US, vocational training is somewhat stigmatized, prompting the change of while name to career-technical education, the two industrialized nations (Germany and US) have very strong value, predating their industrialization. On the one hand, students in Germany believe that the society holds the academic and vocational paths in equal esteemed (Debrah-Karikari et al, n.d.), on the other hand, USDoE (2019) affirmed an eight year consistent higher median earnings for graduates of high school CTE programmes, from the date of graduation, than there is for those of non-CTE programmes at same level.

Furthermore, in a 2016 survey conducted by the European Centre for the

development of Vocational Training (CEDEFOP), 68% of EU citizens (two in three Europeans) say ITE has a positive image in their country, with only 23% having the opposite view. The survey report specifically stated that the distribution of the positive image affirmation

in each member states of the EU is greater than the sum of the negative affirmation and those that are neither here nor there. The survey report is represented below.

Q15 Would you say that these days vocational education at upper secondary education for those aged 16-18 has a positive or negative image in (OUR COUNTRY)? (% - EU)

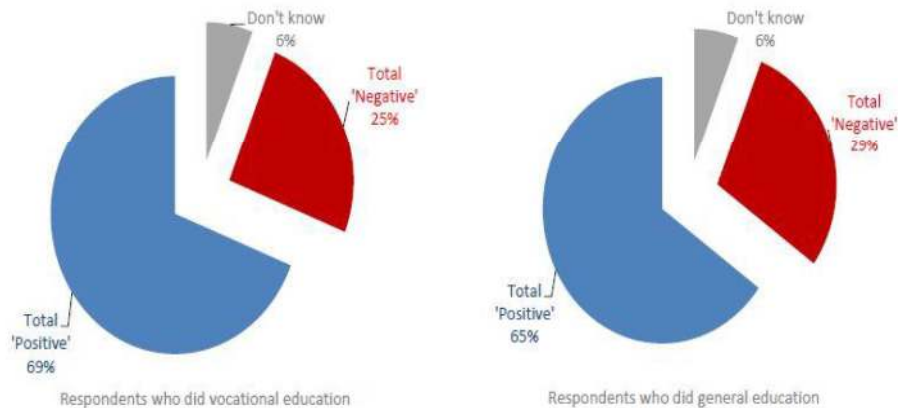


Figure 1: Chart showing percentage acceptability of TVET among students in Europe

Source: CEDEFOP (2016) opinion survey for VET in Europe

Given the positive reports of societal perception of ITE from developed climes as shown above, it is not in doubt that the results are a reflection of the appreciation of TVET by the various European nations and the disposition of their citizens towards it. The high proportion of students attending vocational orientation courses in Europe, shows that TVET is not stigmatized but is rather regarded as the appropriate transition from school to work (a path that is considered to be the major reason for low youth unemployment rates). Further analysis indicate that some EU Nations provides opportunities for advancement in along the vocational education pathway. Be that as it may, European societies places premium on ITE. UNESCO-UNEVOC (2012) reports that certain issues about TVET are constitutional matters in the German nation, as articulated in "Grundgesetz: Article 12". In addition to implementing these constitutional matters in very practical terms, Germany has equally concentrated on strengthening the bond at the intersect of its mix of trade/professional training system and its liberal higher education system,

thereby raising the profile of ITE in that country even further.

On the other hand, many developing nations are said to have woken to the realisation of the great import well-developed, implemented and sustained ITE programmes can have on their economies. Consequently, many such developing nations are now strategizing, showing intent to develop and catch-in-on, talking about, and emphasizing the potentials of TVET (Chamadia & Shahid, 2018; Woyo, 2013). For example, Woyo stated further that Zimbabwe was awoken by this realization and new pursuit. In same regard, and to further underpin the importance of ITE and make its placement in the pursuit of national development evidence to all, Afeti (n.d.) observed nations are making recourse to ITE as a very key component in their national poverty amelioration strategies. For example, Afeti noted how developing nations, such as Cameroon, Cote d'Ivoire, Ghana, Lesotho, Malawi and Rwanda, are working hard at improving and integrating ITE and other practical-based training to national

development plans and ultimately to implement it in their education system for the development of technical and entrepreneurial skills among their prospective workforce. According to Afeti, other developing African nations such as Chad, Ethiopia, Guinea, Senegal, Sierra Leone, Uganda, and Zambia are not left out of the drive to prioritised ITE initiatives in their national development plans.

It is evident that the recognition of the critical place of vocational/technical skills in fostering sustainable development and quality livelihood and the premium placed on it by the US and most European Nations predate the industrial revolutions. Even as the societies became more complex with a constantly metamorphosing education process, vocational training/education which was hitherto the only learning route in prehistoric and pre-industrialized eras, became more and more “devalued” and stigmatized in some climes. However, probably in a bid to remove the term thought to provoke the devaluation and stigmatization of vocational training/education, the nations that placed premium on this form of education sought to keep its social status high by re-naming it, ITE and CTE respectively in their different societies. Long before now, the advanced world had taken bold steps to repositioning ITE in their various climes, so as to leverage on its many possibilities and advantages. For example, in 1970, Richard

Nixon the former US President advocated the re-naming of vocational training to Career Education (Association for Career and Technical Education [ACTE], 2019). The advocated change cited in ACTE was due to the term “vocational education” being too irrationally defamed at that time, as less desirous to academic preparation and because the scope of its curriculum were not considered enough for other academic paths considered viable careers by the society. Similarly, UNESCO also projected and adopted a change of name from vocational technical education to TVET. However, time has proven that strengthening TVET in order to foster sustainable development and quality livelihood goes far beyond a change in nomenclature. In fact, besides change fully accepting UNESCO’s description of TVET or ITE to include the study of technologies and related sciences, the US did not only change nomenclature from Vocational Training to Career-Technical education, it also categorised other class of programmes, having certain training procedures, under CTE. The category of programmes according to USDoe (2019) include those that have who on-the-job training, internships, practicum, clinical experiences, cooperative education, apprenticeship and pre-apprenticeship practices embedded in the training processes as seen below



Figure 2: Chart showing activities of programmes classified under CTE programmes in the US
Source: USDoe (2019)

Perhaps to explain the chart in Figure 2 more appropriately, USDoe (2019) suggested there are 16 career clusters under the CTE programmes, and they include Arts, Audio-Visual Technology, Communication Technology, Business Management and Administration, and Health Sciences among

other Technology-based and related Science-based ITE programmes. Little wonder the CTE programmes have high societal perception and social acceptability among Americans as against its status Africa.



IMPLICATIONS OF STRENGTHENING ITE WITHOUT IMPROVED SOCIAL ACCEPTABILITY

It is common knowledge that humans naturally crave social recognition and acceptability. Thus they quietly and sometimes subconsciously tread on pathways, and engages in activities that would bring about such honours even when needs in the lower hierarchy of Maslow's pyramid are yet to be met. Though this "silent" crave is most often within individual social class, it is also a desire that transcend the boundaries of class; it is one that is not only strong enough to inspire an individual into seeing the possibilities of a change into a better or higher social class, but also, to energize the individual into pursuing such goals. The implication is that, in some instances, the plausibility of the Maslow's hierarchy of needs notwithstanding, satisfaction of needs in the order of lower needs of the pyramid before the higher ones is not always the case (Kopsov, 2019; Nyameh, 2013; Reid-Cunningham, 2008). Kopsov postulated a ring structure to depict this possible interaction of needs as against strict compliance to the Maslow's hierarchical pyramid order. This explains why young students are not ordinarily enthusiastic in following the TVET path as they do other career path like medicine, law, engineering, and accountancy, in spite of the attention and investment on TVET in recent times, both locally and internationally. Preference for other career/professions to ITE only presupposes an innate response to the 'silent' crave for social recognition and acceptability, which is a higher need in Maslow's grading of needs; one that is attainable only within careers and professions, which the societies have adjudged prestigious and accorded high social status. In fact, Kopsov's submission gave better insight into conclusions drawn by Martin and Loomis (2013) after they critically assessed a study by Yamamoto et al., involving more than 1,700 children in grades 2 through 9. In the said study, the children indicated that the most stressful events in their lives bothers on threats to their security and those that threatened to embarrass them, thereby challenging their developing a sense of love and belonging. Judging by Maslow's classifications of the order of needs, the grades 2 through grade 9 students should

ordinarily be mindful only of their physiological and safety needs. However, what is commonly evident among most students is a very strong concern about securing a prestigious place in the society, which by all means is in accordance with societal definition. Impliedly, societal view of concepts and ideologies is key to every practice and pursuit, including the education process. The said views and ideological disposition is the foundation or basis for a belief pattern within the society, it is the cementing factor that binds a body of knowledge and consequently the concretization of a preferred set of skills. Regardless of how good a programme is, how well it is promoted and strengthened, its unacceptability within a given society makes it as good as a non-existent programme in that society.

ENHANCING THE SOCIAL STATUS OF ITE IN DEVELOPING NATIONS

One critical factor for any given vocation to be a major contributor to the attainment of sustainable national development and achievement of quality livelihood is the perceived social status of the vocation, its eventual acceptance by the people of a community, and their pursuance of every preparation towards effectively practicing the said profession. This is because individual perception has everything to do with acceptance and consequent utilization of ideas, concepts, and technologies. It is asserted therefore, a positive societal perception is key for effective implementation of ITE in all climes (Allais, 2020a; Chamadia & Shahid, 2018; Mutarubukwa & Mazana, 2017; Okocha, 2009; Zeleke, 2018).

Consequently, attempts at strengthening TVET are not holistic without deliberate concerted effort at eliciting very positive societal reaction for it. Judging from the factors fingered as responsible for the negative perception and eventual stigmatization of TVET, it is evident that the main issue is similar to that of the caste system, which has a strong negative root in many societal systems in Africa. In the circumstance of established societal social structures and negative perception of ITE, social acceptability of TVET programmes would most certainly be at the lowest ebb. Given the innate natural crave of man for recognition and acceptability; he could never at any time, in



his right frame of mind make any decision, especially when it is within his power that would place him amongst the low caste in the society in terms of vocation. He would therefore rather opt for a career/profession, which the society accepts as prestigious. Therefore, all efforts at strengthening TVET, including the rebranding, robust policy formulations/implementations and huge financial investment, both at the level of individual nations, and at the level of United Nations through UNESCO, would not yield much except people and societies come to appreciate and or accepts TVET as good enough to catapult them into El Dorado. That is to say developing societies must deliberately place premium on the ITE programmes and raise the social status of its recipients, because only then would the social acceptability of TVET increase, and only then would societies truly reap the gains of ITE.

CONCLUSION

Notwithstanding the efforts expended at strengthening TVET, this paper concludes that should the society not appreciate and accept it as one indispensable route to innovative technological development, social development, self-actualization, as well as to achieving quality and sustainable livelihood, it would not at all meet set objectives. A nation could earmark its entire budgetary allocation to the development and provisioning of TVET programmes, so long as there is a prevalence of negative perceptions about the programmes amongst the citizens, students would hardly ever consider embracing TVET, neither would parents or guardians approve nor recommend its programmes for their children, wards and relatives.

It is also concluded that even in the circumstance where perceptions about TVET programmes becomes positive, the citizens would still not enthusiastically catch-in-on the many advantages of this aspect of education until the societies, as a matter of urgency, deliberately puts premium on TVET programmes, the importance and social categorisation of TVET graduates. That is to say, the societies must deliberately place high social value on TVET and TVET programmes; appreciates and accepts TVET as the veritable key to national development and to attaining/sustaining better quality livelihood. In

addition, they must foster an environment where graduates of TVET have high social standing with income commensurate with their different levels of training and for the quality of services rendered. This will afford graduates of TVET programmes a prestigious place in the society.

In addition, ILO and UNESCO would be instrumental in facilitating increased social acceptability of ITE especially in developing nations, as individual nations may not realize the urgency that increasing the social acceptability of ITE demands, nor how critical this is for sustainable development and quality livelihood. The roles of these organizations are also pivotal to increasing the social ratings of TVET and the social status of TVET graduates, because individual developing nations may lack the political-will to bring about changes that may alter the foundations, which have existed over the years, upon which some careers/professions are presumed more prestigious than others including ITE.

RECOMMENDATIONS

- i. Government of developing societies in collaboration with government and non-governmental organizations must mount up aggressive reorientation campaigns to correct societal misconceptions about ITE.
- ii. National governments must formulate policies and implement same, towards increasing the social status and acceptability of ITE.
- iii. The individual societies must sincerely and practically appreciate and accept ITE as one indispensable route to social development, self-actualization, as well as to achieving quality and sustainable livelihood. They must stop jettisoning TVET while paying lip service to extolling its qualities and advantages.
- iv. The societies, as a matter of urgency, must deliberately put premium on ITE programmes and TVET graduates.

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