

Technical and Vocational Education and Training (TVET) and Inclusive Education: Towards Entrenching Creative Innovation for Technological Advancement in Nigeria

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Abstract

Technological advancement of any nation is largely dependent on its ability to innovatively apply scientific knowledge and skills in addressing societal problems. This presupposes that when skills are acquired and applied creatively toward satisfying a need, individuals are not only transformed but, the nation also develops economically. The knowledge and skills needed to bring about this transformation are garnered through special education system designed to build learner's capacity for efficient service delivery. This paper emphasized that TVET is that type of special education designed to impart in individuals, requisite skills and competencies for sustainable living. This underscores that TVET, in addition to being an indispensable tool for training the mind to understanding scientific principles, empowers the hands to manipulate equipment and tools in solving problems which involve constructing, producing, repairing and modifying or rebranding technological products. However, with the level of globalization modernization has brought humanity, life would have been apparently miserable to man without technological products which include electronic gadgets, electrical devices, automobiles among others. Inclusive education in this context, grapples with education system that allows every learner the opportunity to learn and assimilate knowledge in accordance with his capabilities and vulnerabilities; hence, inclusive education avails every citizen including the physically-challenged and mentally-retarded persons, the opportunity to participate in a learning process that could enable them discover their potentials, acquire employable skills and knowledge to sustain themselves as well as fit into the society and contribute towards nation building. The paper therefore contends that integrating inclusive education into TVET could foster rapid technological advancement of the nation as well as recommends among others that, TVET and inclusive education should be systemically entrenched at levels of Nigerian education system to engender creative innovations to stimulate sustainably productive enterprises in order to boost and optimize its economic potentials.

Keywords: *TVET, Inclusive Education, Creative Innovation, Technological Advancement*

Introduction

A nation said to be advanced technologically if its human and natural resources are harnessed and scientifically optimized for socio-economic and technological transformation of the society. Contextually in this parlance, advancement grapples with the process of using scientific knowledge towards discovering, acquiring/extracting and processing of natural resources in order to produce technological products such as cars, machineries, computers, refrigerators and other commodities used by human beings in meeting their various needs. Hence, any society or nation that uses scientific knowledge or the knowledge of science and technology in providing the needs and/or performing some operations which are manually difficult or impossible to man is regarded as technologically advanced nation, which includes: China, Germany, Japan, USA among others. These nations are christened advanced nations because they have a system or technology which enables them to produce or manufacture sophisticated products that satisfy not only their needs, but also that of the whole world. Little wonder technologically advanced nations are called the world power and this gave them the impetus to dominate and influence other countries of the world politically, socially, economically and technologically.

Studies have shown that, most developed nations embraced technical and vocational education and training (TVET), configured and integrated it into their education system in order to suit their developmental needs. This propelled their quest to acquire the necessary skills and scientific knowledge, which triggered off their imaginative prowess to create, compete and possess their place in the global market economy. Interestingly, Nigeria adopted TVET with the aim of equipping her citizens with the needed skills to become professional personnel in industrial sector that would sustain their lives and as well contribute to nation development (Federal Republic of Nigeria (FRN), 2013). In a bid to justify this intent and also enrich interested individuals with the knowledge of science and technology to transform the country, technical colleges and technology institutions were established across the length and breadth of the country. Unfortunately, these institutions are still struggling to not only stand but also to dispense its expected goals; which constitute in empowering the learners with employable skills for both industrial and institutional engagement even self-employment. Evidently, this goal has never been met; thus, resulting in colossal joblessness among the youths while the nation apparently declines socio-economically and technologically.

This failure could be attributed to some factors, which include, low enrolment, gender apathy, lack/misappropriation of funds, dearth of committed and qualified teachers, unfavorable public image of TVET, incongruent curricula, non-implementation of education policies among others (Okoye & Eze, 2016; Ogbuanya & Okoye, 2015). Amidst these factors, unfavorable public image and lopsided knowledge of TVET appears to be a serious threat to the development of TVET in Nigeria. This situation culminated to apathy, which eventually labeled TVET education for people with special needs (Okoye, 2013) which by implication suggests that it embraces inclusiveness.

Inclusiveness in this context implies education for all or education for those, who are physically challenged and those who are not. Inclusive education is an approach that ensures the presence, participation and achievement of all students in education (Sambo & Gambo, 2015). This may be in formal schools, or in non-formal places of learning, such as extra-

curricular environments and humanitarian camps. Inclusion emphasizes opportunities for equal participation, but with options for special assistance and facilities as needed, and for differentiation, within a common learning framework (Sightsavers, 2011). In view of the foregoing assertion, some experts contend that fusing inclusive education into TVET could enhance awareness, spur quest for entrepreneurially creative innovation among the neglected or disabled persons. For instance, Indian government pragmatically employed this approach to empower the disabled and physically challenged persons in their country. The result was unquantifiable, because the disabled persons were trained and hired in industries, where they optimized their potentials. Such could be replicated in Nigeria, if only, the government and its agencies are committed and willful to do the needful.

Inclusive Education

Inclusion or inclusive education (IE) can be defined as the philosophy and practice for educating students with disabilities in general education settings. IE implies that all students, regardless of their challenges are placed in age-appropriate general education classes that are in their own neighborhood schools to receive high quality instruction, interventions, and supports that enable them to meet success in the core curriculum (Bui, Quirk, Almazan, & Valenti, 2010; Alquraini & Gut, 2012). IE avails every learner a congenial atmosphere to learn and exhibit their knowledge without intimidation or compulsion. Hence, learning is natural and original and as well sustainable. Inclusion is an effective approach for placement and nurturing of special education students in public schools (McManis, 2017). These inclusive programmes/approaches are sometimes referred to as mainstreaming, which is the selective placement of students with disabilities in regular education classrooms as shown in

Figure 1.

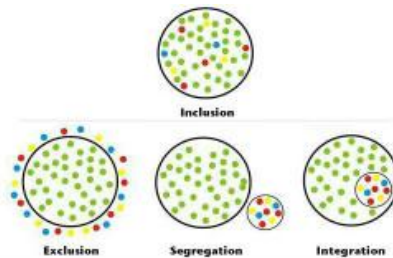


Figure 1: mainstreaming (Mefor, 2011)

Figure 1 depicts various settings under which students can learn. For instance, exclusive: students with disabilities are being excluded; segregation: they are being relegated outside the normal environment; integration: they are brought in but not to interact with others and inclusion: physically challenged are free to play and interact with other members of the class. That school and classroom operate on the premise that students with disabilities are as fundamentally competent as students without disabilities. By so doing, all students can be full participants in their classrooms and local communities in order to receive their education in the least restrictive environment (LRE). Successful inclusive education occurs primarily through accepting, understanding and attending to student differences and diversity, which can include the physical, cognitive, academic, social, and emotional. The driving principle is to make all students feel welcomed, appropriately challenged and supported in their efforts

(McManis, 2017). It is also essential that they are reasonably supported by the regular education teacher, the special education teacher, staff, parents as well as other key stakeholders. Inclusive education evolved out of the realization that all children have the right to receive the kind of education that does not discriminate on the grounds of disability, ethnicity, religion, language, gender and capabilities (Alquraini & Gut, 2012).

Inclusive education allows for students with special education needs to spend all, or at least more than half, of the school day with students who do not have such needs, the practice has been criticized by advocates of and some parents of children with special needs on the grounds that some of these students require instructional methods that differ dramatically from typical classroom methods. Critics contend that, it is not possible to deliver effectively two or more very different instructional methods in the same classroom. Such critics are of the views that, the educational progress of students who depend on different instructional methods to learn often fall even further behind their peers. On the contrary, supporters of inclusive education affirm that it could help children to learn social skills in an environment that approximates to normal conditions of growth and development.

Substantiating this assertion, Alquraini and Gut (2012) posited that children during their formative years develop language more effectively if they are with children who speak normally and appropriately. This connotes that, if school and community environments can be made physically and programmatically accessible, children and youth with physical disabilities could function effectively and well, enable those without disabilities access their environment even more readily. The potency of inclusive education has been proven by some advanced nations who have the capacity to procure requisite technologies for training/teaching as well qualified personnel, who would effectively and efficiently man the learning process (Torreno, 2010). This has gone a long way in dispelling some seemingly misconceived notions and unassuming challenges that could threaten such learning environment where physically challenged and non-disabled students cohabit since teaching methods, assessment tools and vital exercises are often designed to elicit corresponding stimuli in learners. This may sound utterly impossible in Nigeria because leaders at all level have not shown convincing commitment and political will-power to advance the course of its public education. Interestingly, as Nigeria aligns herself with the whole world to pursue a viable educational system that could transform its citizens so as to streamline the economy, it becomes pertinent to ask: What direction should be followed in order to provide quality inclusive education for an army of special needs learners?

To this end, Ajuwon (2014) posits that, Nigeria like many other developing countries should understand that education is a social process that not only transcends self-discovery but also deals with developing in children an increasing sense of independence, personal responsibility and belonging to their diverse community. Ajuwon further maintained that, it has never been sufficient for government officials to merely endorse international protocols of special needs education that have not been adequately researched or tested in developing countries which are exactly what the Nigerian government usually do. It could be deduced from the foregoing that if IE is adequately researched upon and logically implemented, the nation could be saved from spending huge amount of money and resources on policies /programmes that might not thrive. This calls for public enlightenment to inculcate in the citizenry a holistic attitudinal

change that could foster high sense of acceptability towards children, youth and adults who have disabilities of any sorts. By so doing, disabuse the minds of the people of the inconsequential superstitions about causation of disabilities as well as demystify the fears and myths about children with disabilities, which often create misunderstanding and inhibit normal interaction.

Case for Inclusive Education in Nigeria

Children with disability deserve equal access to quality education. Experts in special education have suggested that an inclusive education should be encouraged by governments through the provision of critical infrastructures and other facilities which enhance learning, socialization and the overall development of children with disabilities (Mefor, 2011). This was exemplified in Chioma's journey to excellence; which depicts a clear picture of inclusive education as summarily evident in Mefor's study.

Chioma Aroh, became a pupil of one of the primary schools in Anambra State at the age of six. She was as smart and intelligent and as determined like her many classmates striving for the best, striving to earn praise from both her parents and her teachers. Only that she was crippled; a condition which emerged from a deadly polio disease that struck her when she was a baby.



Figure 2: Chioma and classmates (Mefor, 2011)

Interestingly, her crippled nature didn't deter her resolved and that of her parent's to be educated. Meanwhile, her parents were confused about what to do, seeing how little Chioma loved to play with children of her age, they decided to enroll her into the primary school where she would meet and interact with other children. With unwavering determination, she moves around with clutches and made friends; until her parents were able to buy her a wheel chair, which made movement much easier. She joined the other children in every activity they did in the school including football. With the 'I can do it spirit' burning desire in her, Chioma didn't stop at the primary school level. She went through secondary and university education and obtained a degree certificate in Mass Communication.

Interestingly, when interviewed by Leadership Education, Chioma affirmed that she couldn't have excelled if her parents had shielded and prevented her from associating with her peers in spite of her physical impairment. She also, declared that the school provided an enabling environment that heightened her confidence in tackling one task after another successfully. The narrative above buttressed that her performance in school stemmed from what she learnt from socializing with non-disabled students in her class (Mefor, 2011); which validates the saying that, there is ability in disability. Who knows what would have become of her if she

was denied the opportunity. By implication, inclusive education is meant to bring every student together in an environment that gives them equal opportunity to learn, express themselves and demonstrate their talents. However, teacher capacity building is absolutely necessary in bringing out the best in children with various kinds of learning difficulties (Nnama, 2015). It is therefore, worthy of note that if such children/learners realize that they are endowed with enormous potentials to do all things irrespective of their apparent disabilities or learning difficulties, adoption of inclusive education would be one of the hallmarks of Nigerian education system.

Entrenching TVET and Inclusive Education

The foregoing exposition underscores the potency of TVET and inclusive education towards the realization of educational objectives which grapple with development of human person. However, development of human person involves every activity, training and experiences exposed to individuals with the aim of not only equipping him requisite skills and knowledge but also, to be able to creatively apply such skills and knowledge in solving societal problems. Such activities, training and experiences needed to prepare individuals for work cannot be conducted in the terrestrial realm, rather in well-equipped institutions situated in this planet earth. Regrettably, such institutions meant to impart the necessary skills and competencies are not only short in supply but also, beset with some teething challenges that tend to undermine learning, such as lack of government's will power to implement educational policies, poor funding, incongruous curriculum among others (Okoye & Eze, 2016).

However, TVET was established to facilitate the impartation of skills and knowledge required for advancement of creative innovations. Creative innovation can be viewed as the systematic application of scientific knowledge, ideals, principles and skills to bring a change into the society. It could be recycling, manufacturing or modification of existing technological products. Suffice it to say that, integrating TVET in IE could help to recover, empower and harness the latent abilities of army of persons with disabilities in Nigeria for socio-economic growth of the nation. Such integration could readily avail everybody irrespective of their ability or disability equal opportunity to acquire employable skills for a fruitful live (Nnama, 2015). Indeed, it could further strengthen the educational system for real productive enterprise since inclusive education gives everyone equitable opportunity to learn, assimilate and demonstrate their experiences in accordance with their interest and capabilities. Given due attention, the paper advocates that integrating TVET into inclusive education could significantly impact on technological advancement of the nation should attention be drifted towards these dimensions:

1. Teachers' attitude and professional development

Since teachers are regarded as the prime mover in any educational settings, because they plan, organize and direct the learning process so as to meet the expected learning outcome in the learners, as such, there would be no gainsaying the fact that, their attitudes and competences would greatly determine the impact of learning objectives in learners. This justifies the imperative to invest in capacity development of teachers to make them more vibrant and knowledgeable in order to effectively handle the challenges of the 21st Century teaching. That

is why the welfare and professional development of teachers in advanced countries are prioritized (Nnama, 2015). To achieve the desired inclusiveness that could impact positively on the economy, teachers should be optimally remunerated, conscientized and equipped with novel knowledge, skills and teaching methodologies of the 21st Century in order to effectively impart in the learners.

2. Adoption of innovative teaching methods

Innovative teaching methods can be simply defined as unconventional techniques, strategies or approaches which the teacher aptly applies in delivering instructions to engender optimal realization of instructional objectives. Such methods are anchored on constructivist's learning theory; which underpins that effective learning is experiential. This implies that learners could perform better if actively involved in a teaching environment where teachers act as facilitators (Kin, 2005). It is also known as student-centered method, because, it provides a learning environment where students are allowed to discover and optimize their talents in problem-solving based activities (Okoye & Eze, 2016). According to Ilo in Nnama (2010), method is for the child and not the child for the method. Based on the foregoing analogy, it could be deduced that adoption of innovative teaching methods that are rooted in constructivism, instead of behaviourism could enable students learn actively as well as easily assimilate concepts irrespective of their physical status.

3. Availability cum utilization of instructional materials

Provision of adequate instructional materials in schools as well as their optimal utilization in instructional delivery is sine qua non to effective teaching and learning. According to Ukoh (2016), unavailability of instructional aids/material has posed a grave challenge towards effective instructional delivery especially, in psychomotor oriented programmes such as TVET in Nigeria. This is because virtually all the schools designated for TVET enterprise do not have the requisite material and equipment to learn and consolidate what was taught pragmatically. Against this backdrop, it is therefore, out of context to question the emergence of army of unemployable graduates presupposed to pilot the industrial sector, roaming in search of white-collar jobs at expense of their God's-given potentials to do exploit. Going by this scenario, what would one expect from engineering or TVET students who never practiced or successfully worked on any functional machines or engines until graduation? Unless, something is done to address this phenomenon, every effort to avert the trend and propel the technological inclination of the country to limelight would likely go fiasco.

4. Students' perceptions, interest and attitude to study

One of the cardinal factors that determine the success of any engagement or enterprise is interest. Hence, when one's interest is won or arrested, the head, body and soul of such a fellow would irresistibly concur to the stimuli. This informs the inclusion of set induction in the teachers' lesson plan (Nnama, 2010). Apparently, learners' interest and perceptions of certain concepts often influence or presage their attitude towards it and ultimately the learning outcome. For instance, many students who would have performed well in mathematics relinquished it, either because they hated the teacher or they find it absolutely impossible to comprehend owing to their ill-preconceived notion that it's a hard subject. To achieve the desired inclusiveness that could transform both the human and material resources for

sustainable development of the nation, all and sundry should be made to understand the programmes and key in with every sense of commitment not haphazard approach.

5. Prioritization of educational goals towards problem solving

Since education is regarded globally as a veritable tool for personal development and national transformation, most nations who actually envisaged resourceful human persons and sustainable economy usually do everything within their disposal to achieve functional education. However, functional education is one whose policies and practices are aimed at empowering individuals with the requisite skills, experiences and training to optimize the nation's potential towards solving societal problems such as unemployment, poverty, insecurity of live and property among others. Evidently, developed countries like the US, Germany, UK tailored their education systems towards this premise. That is not so in Nigeria because, its curriculum is obscure and implementation of programmes and policies inconsequential. Hence, the need to all-inclusively adjust and reconfigure the curriculum in order to meet the dare needs of the nation.

6. Parent's feelings and attitude

There is no denying the fact that the disposition and attitudes of many parents and guardians often time influence their children's choice of career as well as the extent to which students actualize their educational goals. This view is congruous with the assertion of Nnama (2015), that children do better academically when the right choice of career is made and adequate support given by parents and guardians. That is why most parents are hell-bent and self-opinionated about the courses their children study regardless of their interest and inclinations. This idiosyncrasy has not only affected enrolment into TVET programmes but also denied many students the opportunity to discover their true callings and eventually ended up in occupations which made them perpetual underachievers who only struggle to survive.

7. Orientation of students, teachers, school administrators and government.

The quest for the redemption and optimization of abilities in disabilities has been in the front burner of international discourse. This aimed at producing resourceful human persons who could engineer national transformation and sustainable economy. Apparently, inclusiveness through aggressive campaign and value reorientation seem to be a great weapon to meeting this demand. This posits the need to embark on an informed orientation and re-orientation programmes that could expose students, teachers, school administrators and government to this trend; which could compel them to redefine their aims, interest and commitment towards optimizing their creative acumen through their callings or vocations for national development.

Conclusion

Even though several studies have been conducted to determine the effectiveness of inclusive special education programs, no conclusion has been reached. Many positive signs have been observed with both special education and regular students. Some proponents of inclusive education programs argue that segregated special education programs are more detrimental to students and fail to meet their educational goals. Professional development classes for both special and general education teachers could produce a better understanding of the concept of inclusive education. When provided with the proper tools in an inclusive setting, special needs

students have the opportunity to succeed along with their non-disabled and this could help in entrenching creative innovation for technological advancement in Nigeria.

Recommendations

Based on the discussion above, the paper recommends:

1. Government should construct new buildings to be used for pilot studies across the states of the federation. Such buildings should be designed in such a way to accommodate the needs of the physically challenged, thereby creating maximum accessibility for all students, not only those with special needs.
2. Government should provide training and re-training programmes for TVET teachers and special educators and also ensure that they are properly deployed at primary, secondary and tertiary institutions.
3. Teachers should be trained and encouraged to improve on their competencies so as to embrace the new teaching order without reservations.
4. The stakeholders in education system should be adequately conscientized about the nitty-gritty that underpins inclusive education and thereby intensify advocacy and publicity for successful implementation.

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