Original Article

Constraints to Teaching and Learning of Science, Vocational and Technical Education in Enugu Municipality, Enugu State, Nigeria

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Abstract

The purpose of the study was to determine the constraints to teaching and learning of science, vocational and technical education in Enugu, Nigeria. The study addressed the curriculum of science, vocational and technical education in Nigeria. It examined the challenges inherent in the implementation of the curriculum. Fifty (50) respondents were selected by simple random sampling and responses obtained with structured questionnaire and focus group discussion schedule. Data were analysed using descriptive statistics. The findings showed dearth of instructional materials and non-comprehensive curricular as major constraints to teaching and learning science, vocational and technical education in Enugu. Based on the findings, the researchers made this major recommendation: sourcing and supplying of up to date facilities, curricular and tools into the schools' workshops and laboratories.

Keywords: Science, vocational and technical training, teaching /learning constraints, effective implementation, curriculum, Nigeria

Introduction

Science, vocational and technical training/education in Nigeria has been increasing and expanding in the areas of metal works, carpentry, textile, building, electrical works, auto mobile, auto – mechanics, air conditioning and refrigeration, catering , soap and cosmetics production, tools and machinery parts fabrications, agriculture, food processing , preservation and packaging; typing, computer operation and repairs; radio and television mechanics; shoes and leather works; painting , bricklaying, pottery , pot making and numerous other areas of economy. Science, Vocational and Technical Education (SVTE) by UNESCO (2014) is training designed to prepare skilled personnel at lower levels of qualification for one or a group of occupations, trades or jobs. The Nigerian Education Research and Development Council (FGN, 2004), defined SVTE as those aspects of

training that involves general education, the study of technologies and related science; and the acquisition of practical knowledge. For George and Shaker (2017), it is part of learning by an individual that learns successfully how to carry on a job by use of skills, and competence on the job.

The basis of science, vocational and technical learning is therefore, knowledge acquisition of socially receptive skills. For UNICEF (2022), it is a way of skill and competence for forming and designing things. According to FGN (2014), the term science, vocational and technical training, is given in schools or classes, field or Laboratory /workshop, and all related academic instructions incident thereto, under public supervision and control or under contract with a state board or local education authority. This is conducted as a part of a programme designed to prepare individuals for gainful employment and in emerging occupations or to prepare individuals for enrolment in advanced technical learning programme.

The committee on research and publications of the American Vocational Association (2014), and Kennedy, Udo and Ufot (2017) agreed that it is education for nurturing competencies, skill appreciations, knowledge and competency needed by workers to enter and make progress in employment on a useful and productive basis. It is an integral part of the total adult programme and contributes towards the development of good citizens by developing their physical, social, civic, cultural and economic competencies. History indicated that vocational and technical education which is an aspect of education that leads to the acquisition of practical and applied skills as well as basic scientific knowledge has been in existence before the coming of western education in Nigeria. For instance, Awka in Anambra state was well known for their blacksmithing and giving of unorganized education in blacksmithing (Nnorom, 2015). Even though this type of education was not encouraged and the existing ones were destroyed as a result of selfish interest of the white missionaries, they still have some technical skills and impact amongst the Awka men today just as the wood carving skills.

Objectives of Science, Vocational-Technical training:

The Federal Government of Nigeria (FGN, 2004) stated the objectives of science- vocational-technical education to include all facets of trainings to imbue graduates with competency and skills for self- reliance. These are: (a) skilled workforce for industrial growth, (b) Innovative trainings for occupational jobs in science, agricultural and industrial growth; (c) People who can apply scientific knowledge to the improvement and solution of environmental problems for the convenience of man; (d) vital skills for the production of craftsmen, technicians enterprising and self-reliant; and (e) Youths to have an intelligent understanding of the increasing nature of science and technology.

Regarding science, vocational and technical education in pre-colonial Nigeria, Ojimba (2012) maintained that education in the traditional African setting had the belief of functionalism as the sole guiding principle. The acquisition of specific science, vocational training and the norming of a good manners towards honest labour was the pivot of its training. However, Okoye and Animonu (2016) observed that in Nigerian society before the advent s of western education, occupational training was grouped into (a) science -vocational-agricultural education, (b) trades and (c) crafts. Regarding the national policy on education, FGN (2004) stated that teacher education will be critical in all science, vocational and technical training development

There is, therefore, a belief that the teacher factor is a critical one as ‘‘no system of education can be above the quality of its teachers’’. Thus, the teachers’ expertise is a very important consideration in norming the standard quality of education. Nnorom (2015), also agreed that ‘competence and dynamic teaching workforce will be the bed rock of quality science, vocational and technical training. Okoye and Animonu (2016) agreed that research has shown that high skilled teachers produced high performing graduates. The national challenge is that, despite the enormous need for skilled teachers, there is serious lack of professional teachers, in all ramifications. Efforts made in ameliorating the shortage by rapid pre-service teacher training schemes did not yield any positive results in competence training. Adayanju (2004) notes that among other things, outstanding teachers possess high skills and competency to problem solving, and very keen enthusiasm about empowering and nurturing of trainees. Beside competence, and skills, dynamic qualities must be gradually sustained. This means the need for sustainable competency and skill trainings for

teachers at all levels. The above view point was further supported by the vision of the National Teacher Education Policy (2007) which has as its aims to: Produce self-reliant, innovative, and skilled teachers based on trainings to encourage a generation of graduates who are competent globally.

Clearly, the above further emphasizes the significance of continuing professional development (CPD) as a way of nurturing a crop of experts that can be above board in global market of labour (George, Udeme & Ufot, 2017). For Okwor (2007), top on the list of several problems of science, vocational and technical education curriculum implementation is the lack of competent and skilled teachers. The ageing population of professional technically competent teachers of the established SVTE schools, most of who have retired from service is one drawback to effective implementation of SVTE curricular. Again, most facilities are not only in a state of disrepair, but are inadequate for prospective students of the various trades and vocations offered by the Schools. Several tools in schools are out modelled and unable to fit into the digital technology of the millennium. Scarcity of instructional materials and books in these schools gives rise to not too efficient products of these institutions.

Ojimba (2012), also observed that, trainees who are not practical oriented are made by parents or peers to undergo training, they are most unsuitable because they disregard vocational guidance which should have informed the choice of vocations. According to Uwaifo (2010), there is pronounced greater preference for degree certificates than technical skills and expertise in the Nigerian society which hampers rapid socio-economic and technical development of the nation. The situation is so pronounced that the demand gap for efficient technicians are often met and supplied by such professionals from neighbouring states and countries like Ondo, Togo, Benin Republic and others, who see the area as a thriving market for their services. Their services range from carpentry, bricklaying, tiling, painting, plumbing, plaster of Paris (P.O.P) pillars in buildings, plastering walls to P.O.P ceilings. Many of such aliens are found in electrical and electronic installations and services at the detriment of our poorly trained internal products. Modern architectural designs construction, for which these aliens are competent presents them as better alternatives than our SVTE schools products in the competitive labour market.

Poor financing of our SVTE schools dates back to the period of the 6-3-3-4 education system: The vestiges of workshops and laboratories equipment of the system are still being managed against improved and modern digital workshop equipment in various vocations and trades. Some privately owned vocational institutions such as "Olu Aka Di Mma" and St Joseph's Institute are making progress in areas such as automobile maintenance/services, metal fabrications, electrical installations, textile designs, food processing and packaging and the likes. In the words of Nworlu –Elechi(2013),although government owned vocational schools have made achievements in building constructions and reconstructions, much need to be done in the area of tools and equipment supply as well as trained staff in the areas of trending vocations and crafts.

However, Ojimba (2012) stated that another problem to efficient implementation of Science-Vocational-Technical learning curriculum is the absence of industries, poor employment opportunities for the graduates by the few industries around the municipality and beyond. When there is job opening, preference is placed more on expatriates than the products of our institutions. Consequently, it leads to poor enrolment in vocational streams across the schools in Nigeria. While Olagbaju and Nnorom (2019) agreed that the weak industrial engagement in the implementation of the Science- Vocational –Technical Education curriculum is another impediment that distances both learners and parents from enrolling into Science- Vocational-Technical learning institutions. The era of industrial attachment for Science-Vocational-Technical Education trainees seem to be over. The attendant uncertainty of being employed after graduation by the industries in the city triggers a withdrawal syndrome among intending students (Asogwa & Diogwu, 2007).

Olajide Odoma Okechukwu, Iyare and Okhaimoh (2015) and Ughamadu (2016) reported that some moribund instructional modules and scanty courses expose the products of the institutions to low grade assessment in the global labour market. Technology and associated tools and equipment are ever changing with the changing world and the trainees of the SVTE schools need to be carried along with trending modifications if the managers of the schools will increase their funding of these schools. George, Udeme and Ufot (2017) stated that over-crowding of classes by trainees, especially in urban SVTE schools raises some questions on the quality of their graduates.

Available facilities and equipment are not enough to guarantee effective implementation of curricular and hence efficient graduates. On the other hand, the deployment of teachers to rural schools presents an unbalanced ratio of teacher to students and do not ensure uniform standard across schools.

According to George, Udeme and Ufot (2017), facilities and laboratories are insufficient in schools. The course content of science, vocational and technical education curricular does not fit into the specific job needs of trainees in their various fields of training. Students undergo a theoretical training with little practical, some with no opportunity to have practical training on the Industrial Training tools. Students leave school armed with theoretical ideas with no practical skills. Teachers have little exposure to skills on instructional technology with foundational career. Thus, new teachers lack skills in a technology – enriched classroom or how to use tools in practical as agreed by Okwor (2007), Nzeako (2005) and Oliver (2002). For the science, vocational and technical equipment to be active, it would need regular electricity. This is either lacking or erratic in supply in the schools. Thus, installed facilities are idle due to lack of regular electricity while frequent fluctuations in power voltage can spoil installed gadgets. School managers may opt for generators, thereby frequently buying diesel or petrol and at the same time maintain them. This is a drain on the lean resources of schools, as a result, science, vocational and technical training is inactivated in the schools' teaching and learning process.

Statement of the Problem

One of the main gaps in the Nigerian education system is the low priority given to science, technical and vocational training. As in most former British colonies, education in Nigeria was designed mostly as purely reading and writing. University degree is now a show of prestige in Nigeria. However, technology, agriculture and other practical subjects particularly at the sub-professional levels, have not won esteem. There is a gap between the education policy and its implementation. In addition, the Nigerian national policy on science and technical education has it that students admission into institutions will be given to the science based subjects to the ratio of 60% to 40%. Agriculture is the largest single source of Nigerian foreign exchange earner and

statistics have shown that about 80% of Nigerian population depends on agriculture yet agriculture is bereaved and negated at all levels. The classes, laboratories and offices in most of the institutions were poor in decency and insulation from heat and hence the need for appropriate facilities' installation and maintenance in line with global best practices. It is however based on this the study determined the constraints in the teaching and learning of science, vocational and technical education in Enugu, Nigeria.

Objectives of the Study

The purpose of the study was to determine the constraints to teaching and learning of science, vocational and technical education in Enugu, Nigeria. Specifically, the study sought to:

1. Examine the challenges inherent in the implementation of science, vocational and technical education curriculum
2. Proffer plausible solutions to the challenges inherent in the implementation of science, vocational, and technical education

Research Questions

The following research questions guided the study: in eliciting responses from the respondents.

1. What are the challenges inherent in the implementation of science, vocation and technical education curriculum?
2. What are the plausible solutions to the challenges inherent in the implementation of science, vocational, and technical education?

Method

Enugu municipality was the study area. Out of the three local Government areas, Enugu North local Government Area of Enugu State, Nigeria was purposively selected. This was based on accessibility and effective coverage. The descriptive research survey design was used in this work. The purposive sampling method was also applied in the study and the Science, Vocational and Technical Institutions were selected for the evaluation of challenges of efficient implementation

of teaching and learning science, vocational and technical training curriculum in Enugu state, Nigeria.

Then, a simple random sampling was used to select 10 students and 5 instructors/ teachers/ lecturers from each of the three science, vocational and technical institutions as respondents. Moreover, 5 senior staff of the state post primary school management board (Technical) were selected using the same technique. The total number of respondents was 50 people. Structured questionnaire was administered to the respondents and focus Group Discussion schedule was used to sieve out some policy lapses from the staff of the state technical board. The data collected were analysed by the application of descriptive statistics.

Result

Challenges inherent in the Implementation of Science, Vocational, and Technical Education

The challenges in the implementation of SVTE are presented in Table 1. The data reported respondents' agreement to the items. It also showed the percentage of the number of respondents that were in agreement to the items that addressed the research question.

Table 1

Challenges in the Implementation of SVTE

S/No	Items	Frequency	Percentage
1	Dearth of instructional materials, and textbooks	44	88
2	Absence of industrial participation in the implementation of SVTE curriculum in Enugu, Nigeria	42	84
3	Poor industrial attachment for SVTE trainees	39	78
4	Moribund instructional modules and scanty subject contents which lead to low grades in global labour market	36	72
5	Theoretical knowledge without practical skills in science, ICT, vocational & technical education	33	66
6	Inadequate opportunities to participate in industrial training by SVTE institutions	39	78
7	Science, vocational & technical subjects' contents do not adequately address the specific needs of trainees	32	64

Source: Field Data (2022).

The result also indicated that 66 percent of the respondents concurred that there exist theoretical learning with no practical competence in science, vocational and technical education in the study area. Furthermore, 78 percent respondents posited that there are inadequate opportunities to participate in industrial trainings by institutions under survey. Subsequent result has shown that 64 percent of the respondents agreed that science, vocational and technical education subject contents do not adequately address the specific needs of the trainees to gainfully secure jobs in the committee of nations.

Discussion

The results of the study were as shown in tables based on the study research objectives and questions. The Results of table 1 of the study has shown that about 80 percent of the respondents attested that there is dearth of instructional materials, curricular and books. Absence of industries in the implementation of science, vocational and technical training in the study area was reckoned by 84 percent of the respondents. However, other constraints include poor access to industrial attachment for SVTE trainees with 78 percent of the respondents. Again, 72 percent of the respondents inferred that there are moribund instructional modules and scanty subject contents which has led to low grades in global labour markets by Nigerian SVTE graduates.

These findings are in tandem with earlier studies of George, Udeme and Ufot (2017); Okoye and Onyenwe (2016); Uwaifo (2010); Asogwa and Diogwu (2007) on the dearth of instructional materials and moribund modules as challenges facing the science, vocational and technical training in Nigeria. The findings also agreed with the report of Ughamadu (2016) on the theoretical knowledge with no practical skills of trainees in science, vocational and technical training institutions in Nigeria as the subject contents do not positively cover the specific needs of the trainees

Conclusion and Recommendations

Based on the findings, the researchers concluded that there are encumbrance to efficient teaching and learning of science, vocational and technical trainings in Enugu North Local Government Area, Enugu State, Nigeria.

The researchers therefore recommended the following:

1. Industries, parents, the elite and the political class should charge the negative perception towards technical and vocational education, for public acceptance. Individuals are endowed with unique talents. STVE institutions should strengthen their guidance and counselling units and set up new ones where they are non-existent; with a view to advising trainees on appropriate careers best for them for optimum development, fulfilment and competency in self dependent and economic growth.
2. The funding of SVTE institutions should cut across materials and human capital acquisition and development. While millennium friendly technical tools, curricular and equipment should be sourced and acquired by the managing boards of SVTE schools trained and skilled expatriate teachers and instructors should be recruited on exchange programme basis. This will make the schools to be at par with global standards and the products will compete favourably with their mates in the global labour market.
3. Affordable power supply at regular basis is the sole responsibility of the government. Power is the key driver of socio-economic and industrial development of any nation. The political class should muster the political will to urgently fix the power needs of our country. If this is done, our SVTE institutions will stand tall among its contemporaries across the world in science, vocational and technical skills acquisition.
4. To acquire the right skills knowledge and attitudes needed by industries; existing industries as part of their community development efforts, should be mandated to absorb SVTE trainees on Industrial Training (IT). The various SVTE management Boards should liaise with such Government established Institutions as the Industrial Training Fund (ITF), Science Equipment Development Institute (SEDI) and the Project Development Institute (PRODA) all in Enugu with a view to strengthening the technical knowledge and skills of the trainees after graduation

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