
Strengthening Instructional Practices in Technical and Vocational Education to Achieve Sustainable Economic Development in the Declining Economy

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ABSTRACT

Over the years, efforts have been made to boost Technical and Vocational Education (TVE) in Nigeria. Moreover, the present global dwindling economy has made it mandatory for TVE stakeholders to put more effort to improve on the delivery of TVE in most part of the world including Nigeria in order to achieve sustainable development of the nation. Based on the aforementioned observations, the paper examined ways of strengthening TVE instruction in the declining economy era. Two research questions were used to guide the quantitative survey that was conducted in science and technical colleges in Bauchi and Gombe States, Nigeria. A sample of two hundred and fifty-six (256) vocational and technical teachers was randomly selected from a population of four hundred and ten (410). A research instrument titled 'strengthening TVE instructional practices in the declining economy questionnaire (STVEIPDE)' was used for data collection. The questionnaire comprised of two sections that were based on modern facilities and appropriate experiential learning methods deemed necessary in science and technical colleges in this declining economy era. The finding revealed relevant modern facilities that were needed for effective instruction in science and technical colleges. It also revealed experiential learning methods that are relevant for instructional purpose in the current declining economy. In conclusion, the study recommends that government should furnish the colleges with these facilities and also the experiential learning methods be implemented in the colleges for students to acquire effective vocational skills.

Keywords: Instructional Practices, Technical and Vocational Education and Declining Economy

INTRODUCTION

Raising demands for skilled workers and highly qualified middle level technical manpower for sustainable economy in most countries is ever increasing. Technical and vocational in the developing countries particularly Nigeria has to respond effectively to this pressing demand for relevance and accountability particularly in the current economy hardship. This general phenomenon has been attributed to the inability of education sector particularly the TVE for not yielding its potentials in most parts of the affected countries; Nigeria included.

Global problems such as energy crisis, pollution and ecological issues, health problems, food and insecurity and unemployment have aggravated and continue to affect most countries particularly the developing nations Nigeria inclusive. These issues have profound implications for education specifically, technical and vocational education. However, the need to provide adequate staff, laboratories, workshops, other facilities is substantially greater in TVE than for other education systems. Therefore, need to make most effective use of such resource to achieve maximum multiplier and catalytic effects deemed necessary. In spite of this diversity, there is the common perception of the need to improve both internal and external efficiency of technical and vocational education through better instructional practices in the area of appropriate experiential learning approach (Aliyu, Khata, Saud, & Buntat 2015) Modern instructional facilities (Gambari 2014) and relevant learner-centered instructional approaches (Chinde 2014). Improvement in these areas

in TVE could belt Nigeria out of this current dwindling economic.

It is generally accepted that Education is an exercise that engages an individual to acquire knowledge and skills to enable him/her to live as useful and acceptable members of a society (Aigbepue, 2011). Also, Igbinedion and Ojeaga (2012) see education as a veritable means of progress for nations and individuals. Similarly, Wallenborn (2010) opined that Education is a process of updating the knowledge and skills of the individual that will be useful to himself or herself and to the community. Education help individuals to gain ideas, knowledge and experience that will make them useful to themselves and the society.

Unfortunately, the current Technical Vocational Education in Nigeria specifically stays locked by producing simple skilled labor necessary for the world of work. TVE professional view this position that the current TVE system is incapable to respond fruitfully to the needs of the sustainable development strategies (Majumdar, 2011 & Aigbepue, 2011). Thus, TVE professionals in the country need to be called upon to strengthen the TVE instructional practices to include the concept of sustainability by upholding the doctrines of 6R that is "Reduce, Reuse, Renew, Recycle, Repair and Rethink perspectives". Therefore, TVET system needed to be aware of the concept and challenges of SD for applying in the work place particularly in the current horrible declining economy. If the sustainable development concept will be put into practice it may possibly assist in combating the current dwindling economy in the country and the globe at large.

Consequently, the experiential approaches, teaching method, and other

instructional facilities in TVET has to geared towards these changes in order to provide the necessary knowledge, skills and values that will help potential graduates from TVE educational institutions to cope and adapt with the changes for sustainable development in the country. The focus of sustainable development revolves around TVE if properly implemented (Fien, Goldney and Murphy, 2009). Furthermore, Aliyu, Khata, Saud, & Buntat (2015) & Nkeweke (2007) opined that TVE was originated mainly to respond to the demands for change so as to incorporate societal issues by introduce and integrate related environmental concepts into the curriculum of TVE programs.

It is therefore become imperative for experts in TVET to conceive new ways in which the ideas of sustainable development can be introduced into the teaching and learning of TVE. This is due to the fact that the relevant skills required to support the integration of Sustainable development into TVET must lead to the application of concepts related to Sustainable development in the workplace, evaluation of the sustainability to the work environment, identification of the environmental strengths, envisioning of alternative ways to work (Majumdar, 2011).

Date back to the 1992 earth summit conference that took place in Rio de Janeiro, attended by about 120 heads of state and government along with delegates from over 170 nations including Nigeria. The attraction of the conference (Agenda 21) is a major action program focused on what countries should carry out to achieve Sustainable Development in the 21st centuries. It was recommended in the conference that the systems of education that embraces

environment and development specifically TVE to incorporate essential parts of learning that could enhance sustainable development within both informal and formal education in order to achieve favorable economy in the country and the globe at large (Nkeweke 2007 & Varma, 2009). This could be a pre-plan strategy for curtailing issues such as the declining economy that most developing nations including Nigeria are currently witnessing. In addition, the growing concern about sustainable economic development has led administrators, policy makers, and educators to call for a more holistic sustainable development which demands for linkages among environment, social, technological and economic priorities (Oresanya, Omudewa, Kolade, and Fashedemi 2014). This priority issues and concerns has shown that TVET in Nigeria specifically needs to focus on the three pillars of sustainability that covers “economic, social and environment” as the major priorities.

However, instructional practices in TVE in whatever way it objectives are focusing on are of paramount important. The Environmental sustainability is the first pillar of SD It requires a change from “business as usual approach” to Sustainable Development approach of using natural resources wisely, minimizing waste and limit damage to atmosphere and check harmful climate change. This involves the responsible use of raw materials; energy, water few to mentioned and awareness of the impacts of production processes and environmental auditing system. Economic Sustainability is the second pillar of sustainable development. It requires a different and wider, set of economically related knowledge, skill and attitude concerning economic literacy,

sustainable production and consumption and management of small enterprise. Social Sustainability is the third pillar of sustainable development on both the global and local scale, social sustainability involves ensuring that the basic needs of all people are satisfied and all, regardless of ethnicity, gender and locality, have an opportunity to develop and utilize their talents in ways that enable them to live healthy, happy and fulfilling lives. Therefore, the curriculum including other important components in TVET has to mirror these three changes in order to produce TVE graduates that can make meaningful contributions particularly in the present very unsympathetic economy.

Although, integrating sustainable development in TVE is more than just a radical change in instructional practices. Answering the call to sustainable development in TVE according professional requires institutional commitment in six major areas, those institutions that practices sustainable development were distinguished by six practices that help to institutionalize engagement in sustainable ways. These practices are: Integrate sustainable engagement into the college mission, forge partnerships as the overarching framework for sustainable engagement, renew and redefine discovery and, scholarship, integrate sustainable engagement into teaching and learning, recruit and support new champions and finally create radical institutional change (Jane, Holland, Percy, and Zimpher, 2004). Considering the present era of the declining economy, sustainable development in TVE is one of the best hope of educational institutional in the country to achieve mega economic transformation and could be one of the ways for Nigeria to

compete favorably in the knowledge global economy.

It is in the light of the above-mentioned issues and challenges that this research appraised on probable instructional practices in Technical and Vocational Education to achieve sustainable development in the declining economy era in Nigeria

Purpose of the Study

The main objective of this study is to find out instructional practices necessary for improving technical and vocational education in Bauchi and Gombe States; specifically, the study intends: -

- 1) Determine relevant modern instructional facilities necessary for effective instruction in technical and vocational education in the current declining economy.
- 2) Determine appropriate experiential learning methods necessary for effective/supporting instruction in technical and vocational education in the current declining economy

Research Questions

The following research questions were formulated to guide the conduct of this study: -

- 1) What are the modern instructional facilities necessarily needed for effective instruction in technical and vocational education in the current declining economy?
- 2) What are the appropriate experiential learning methods to be use in technical and vocational education programme in the current declining economy?

METHODOLOGY

The study employed a survey research design. It focused on improved instruction practices based on the perception of technical/vocational teacher in teaching technical and vocational education for sustainable development in the era of declining economy. The study was carried out in Gombe and Bauchi States owned science and technical colleges. The population of interest for the study comprised of 310 technology/vocational teachers in the five-state owned science and technical colleges in Bauchi and Gombe States. Out of 210 technical/vocational teachers, 52 were NCE Technical while 158 were Bachelor Degree in education. Due to the relative small number of respondents, the entire population was used for the study. No sampling was carried out.

Structured questionnaire was used as instrument to collect data from the respondents. The questionnaire was structured in line with three research questions. Instrument consists of two sections. Section A sought information on the personal data of respondents. Section B deals with research questions 1-3, which consists of 45 items that was used to determine improved instructional practices in technical/vocational teachers to enhance effective sustainable development teaching and learning in technical and vocational education. Five-point rating scale of Highly Important, Important, less important and

Not important was used to ascertain the responses of the TVE teachers. Data was analyzed using mean and standard deviation to answer the two research questions. The bench marks for the acceptance value is 3.50 and above. Any item with mean of 3.50 and above was accepted while any item with mean of 3.49 and below was rejected. The instrument was evaluated for content and face validity by three experts. The experts include two lecturers from school of technical education, Federal College of Education (Technical) Gombe and 1 director technical education from Gombe State Ministry of education. However, the validate instrument was trial tested using Cronbach Alpha with an internal consistency coefficient of 0.87.

The researcher made use of assistant of head of department in these colleges in data collection. Through the help of these head of departments the researcher was able to account for 100% return of the instrument distributed to the respondents.

RESULTS

Data analyzed and results were presented based on the research questions in table below

Research Question 1:

What are the modern workshop/laboratory facilities necessary needed for Achieving Sustainable development in the Current Declining Economy?

Table 1: Responses of TVE Teachers on Modern Workshop/Laboratory Facilities necessary for Achieving Sustainable Development in the Current Declining Economy

S/N	Modern Workshop/Laboratory Facilities	\bar{X}	SD	REMARK
1	Computer operated machines	3.51	1.78	Agree
2	Modern tool and equipment/instruments	3.52	1.76	Agree

S/N	Modern Workshop/Laboratory Facilities	\bar{X}	SD	REMARK
3	Restructuring of school workshops/ laboratories	3.68	1.66	Agree
4	Effective and Modern workshop/ Laboratory safety facilities	3.64	1.65	Agree
5	Computers and other related Facilities	3.54	1.60	Agree
6	Virtual ICT learning environment such as simulations software & workbench Stations	3.68	1.66	Agree
7	AUTOCAD in TVE trades areas including Technical Drawing	3.50	1.79	Agree
8	Projectors and interactive white boards	3.64	1.65	Agree
9	Modern drawing instrument/Boards	3.60	1.70	Agree
10	Computer Aided Design/Manufacturing (CAD/CAM processes)	3.55	1.74	Agree
11	Patterns/Templates and basic engineering tools	2.54	1.99	Disagree
12	Modern Agricultural implements & agro allied processing equipment	3.51	1.78	Agree
13	Simulation package on 6Rs (Reduce, Reuse, Renew, Recycle, Repair and Rethink) models	3.55	1.74	Agree

Table 1 above reveals response of teachers on the modern facilities necessary needed in workshop/laboratories for effective instruction in science and technical colleges in the current declining economy. All the items (1 – 10, 12 & 13) were having mean values between 3.51 to 3.68, while item 11 has mean of 2.54. This indicates that the respondents agreed that the facilities listed in the 12 items are deemed necessary in the

school in the current dwindling economy. On the hand, facility in item 11 was rated as disagreed. This implies that the facility is not necessary needed in the schools

Research Question 2:

What are the relevant experiential learning methods for achieving sustainable development in the current declining economy?

Table 2: Responses of TVE Teachers on Relevant Experiential Learning Methods in TVE for Achieving Sustainable Development in the Current Declining Economy

S/N	Experiential Learning Methods	\bar{X}_1	SD	Remark
1	Apprenticeship	3.50	1.79	Relevant
2	Internship (Industrial Attachment)	3.54	1.60	Relevant
3	Self-coaching	2.92	2.00	Not Relevant
4	On-the-job training	3.50	1.79	Relevant
5	Volunteerism	3.52	1.76	Relevant
6	Service-learning	3.71	1.58	Relevant

S/N	Experiential Learning Methods	\bar{X}_1	SD	Remark
7	Community work practice	3.64	1.68	Relevant
8	Field Experience	2.64	1.99	Not Relevant
9	Volunteerism	3.85	1.50	Relevant
10	Excursion Visit	3.63	1.66	Relevant
11	Job Shadowing	2.92	1.88	Not Relevant
12	Practicum	2.18	2.00	Not Relevant
13	Horsemanship	3.63	1.66	Relevant

Table 2 above reveals responses of teachers on Relevant Experiential Learning Methods needed in TVE in the current declining economy. Items 1,2,4,5,6,7,9,10 and 13 were having mean values between 3.50 to 3.85 while item 3,8,11 and 12 were having mean value from 2.18 to 2.92. This indicates that the respondents agreed that the experiential methods listed in the 9 items are deemed relevant in the school in the current dwindling economy. On the hand, the experiential methods listed in the 4 items were rated as not relevant. This implies that the experiential methods were not relevant for instruction in the technical schools

FINDINGS OF THE STUDY

- 1) Modern instructional facilities necessary needed for effective instruction in technical and vocational education in the current declining economy
- 2) Appropriate experiential learning methods necessary in technical and vocational education programme in the current declining economy

DISCUSSION

Table 1 above reveals the Modern instructional facilities necessary for effective instruction in technical and vocational education in the current declining economy.

In fact, modern instructional facilities that were specifically found to be of relevant significant for effective delivery of practical instruction in technical education in the current economic condition were computer operated machines, modern tool and equipment/instruments, restructuring of school workshop/ laboratory, effective and modern workshop/ laboratory safety facilities, computers and other related facilities, virtual ICT learning environment such as simulations software & workbench Stations, AUTOCAD in TVE trades areas including Technical Drawing, Projectors and interactive white boards, Modern drawing instrument/Boards, Computer Aided Design/Manufacturing (CAD/CAM processes), Patterns/Templates and basic engineering tools, Modern Agricultural implements & agro allied processing equipment and Simulation packages on 6Rs (Reduce, Reuse, Renew, Recycle, Repair and Rethink) models. This finding corroborated numerous research findings that are available in the literature. For instance, Obeng, Adjaloo, and Amrago, (2013) considered the use of ICT and Computer Aided Design/Manufacturing (CAD/CAM) as a vital ingredient in the training of students in agricultural and agro processing mechanical production, welding and fabrication, drafting technology and

metalwork fabrication fields in technical drawing. The author further lamented that the problem of skills shortage in the world of work are attributed due to lack of these modern facilities. Obeng, Donkor and Quansah (2011) laces emphasis on the need to provide technical and vocational education institution with basic engineering tools, patterns/templates including modern drawing instrument/Boards for teaching mechanical related trades and technical drawing subject. Also, Jia, Yang, Siebenmorgen & Cnossen (2002) and Hadi, Udin & Mingat (2014) also found that the use of simulation packages and software are of highly important in the teaching and learning of many trade in technical and vocational education as they speed up the conduct of practical instruction (complex task), less cost effective, allow training to happen in a safe and realistic manner, reduce rate of stress among teachers/instructor and students. In addition, Ziden, Zakaria & Othman, (2012) confirmed the relevant and effectiveness of AutoCAD 3D Software as a Learning Support Tool toward realizing the objective of sustainable economic development in education particularly the technical and vocational education system. Indeed, the relevant of modern instructional facilities in the teaching and learning of technical and vocation education in this declining economy era cannot be overemphasis.

Table 2 above revealed the appropriate experiential learning methods that are necessary needed in technical and vocational education programme in the current declining economy. Primarily, on-the-job training, apprenticeship, internship (industrial attachment), volunteerism, service-learning, and excursion visit were the

relevant experiential learning methods deemed relevant for out-of-school practical teaching in technical and vocational education programmes. Whereas, self-coaching, community work practice, field experience, job shadowing, Practicum and horsemanship were the experiential learning methods that deemed not relevant for out-of-school practical training in technical and vocational education. The use experiential learning method was supported by numerous authors/researchers in the literature depending particularly in the field of technical and vocational education. For instance, Clark, Threeton & Ewing (2010) observed that experiential learning is a major element of career and technical education for numerous years; its implementation often varies from the research based theoretical framework of true experiential learning. However, Scott, & Sarkees-Wircenski (2008) confirmed that an experiential learning pedagogy has to address the potential of the contemporary technical and vocational education programme that focuses on preparing students for post-secondary education or higher level occupations in the workplace.,

Indeed, the findings of Oyeniyi (2010) and Che, Mohammad, Amin, Mohd, & Mahazir, (2015) confirmed that internship (Students industrial training) is a laudable experiential learning approach for skills acquisition that is geared towards technological and economical sustainable development of a nation. Alison & Lorna (1998) support this finding which mentioned the superiority of apprenticeship learning over others experiential learning (Job shadowing, horsemanship and practicum) within educational institutions by providing learning with the necessary skills needed in

the workplace. On the other hand, the finding of Hunt, Bonham, & Jones (2011) and Aliyu, Khata, Sukri & Buntat (2015) upholds the finding of this study that said that volunteerism, service-learning and community work practice are experiential learning options for effective career and technical education, however; community work practice was observed as not relevant in this study. Beside, Killen (2015) study has also confirms that the use of on-the-job training and excursion visit as creditable and innovative experiential learning activity approaches in engineering education. On the contrary, self-coaching, community work practice, field experience, job shadowing, Practicum and horsemanship are some of the existing experiential learning approaches that are currently in practice in other educational discipline except for this study were found as not relevant.

CONCLUSION AND RECOMMENDATIONS

Current economic recession period (declining economy) has become a global issue that affects most parts of the world including Nigeria as a nation. Every nation that is affected by the declining economy is striving to use all its developmental efforts to survive out of the economic dilemma. Many including Nigeria acknowledged that the education specifically technical and vocational education could serve as one of the mean to resolve the current economic predicament. However, in any technical and vocational education programme, the important of modern educational facilities particularly in the workshop/laboratory cannot be underscored. Therefore, modern education facilities that are necessary needed in the Nigerian TVE programmes are deemed necessary to be provided for

successful instructional delivery. On the other hand, it is also of crucial important to put in place the most desired experiential learning approaches in the existing TVE programmes. Knobloch (2003) concluded that teachers and teacher educators of TVE should base instruction on an experiential model based on philosophies of Dewey, Stimson, Knapp, and Lancelot. These philosophers believed that experience was critical to learning. Thus within TVE, many opportunities for students learning are based on the student participating in a practical experience through model of experiential learning as one of the means that can allows students to learn the course content in the way that best suits their learning technique.

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