

Innovative Policies for Implementation of TVET Curriculum in Enhancing Students Competencies for Sustainable Industrial Development in South-West, Nigeria

by

Oladiran Stephen Olabiyi, Ph.D¹. & Ngozi Uzoka, Ph.D²

¹Department of Science and Technology Education, Faculty of Education, University of Lagos
solabiyi@unilag.edu.ng/olabiyidiran@gmail.com

²Department of Educational Management, Faculty of Education, University of Lagos
Correspondence: ngozime@gmail.com

Abstract

The paper examined innovative policies for the implementation of the TVET curriculum in enhancing students' competencies for sustainable industrial development. A survey design was adopted. Three research questions and three hypotheses, tested at .05% level of significance, guided the study. The respondents for the study consisted of 118 technology education practitioners and the organized private sector (OPS) employers. Data were obtained using a structured questionnaire, simple random sampling was used. The reliability coefficient of instrument yields $\alpha = .85$, Using Cronbach Alpha. Mean and the standard deviation was used to answer the research questions, while independent sample t-test statistics were employed to test the null hypotheses. The findings revealed that strong policies support for TVET to include: adoption of national vocational qualifications system and competency-based training; employers' involvement in the various phases of training; strong apprenticeship system and extensive rural training facilities. There is no significant difference between the mean responses of technology education practitioners and OPS employers regarding TVET policy objectives required to develop students' competencies; how training of TVET students be designed and implemented and innovative strategies to help students achieve key policy goals of TVET programs. It was recommended that: Effort should be made by the ministry of education in collaboration with TVET administrators for formulating effective policy that will strengthen the implementation of the TVET curriculum; quality assurance should be introduced to supervise implementation processes particularly regarding resources and TVET providers to follow regulations and establishment of national vocational qualification frameworks.

Keywords: *Implementation, Innovative Policy, Industrial Development, Competencies, Curriculum, Sustainable and Technical Vocational Education and Training*

Introduction

Technical Vocational Education and Training (TVET) is essential in the achievement of sustainable industrial development because manpower with the right set of skills, attitudes, and knowledge to grow are needed. TVET systems need to prepare their learners for being responsible and well-informed producers and consumers, and for being able to act competently, creatively and as agents for sustainability in their workplaces and society at large. TVET according to Moustafa and Moustafa (2013) is that part of the educational system that provides courses and training programs related to employment to enable the transition from secondary education to work for young students (social objective) and supply the labor market with competent students

(economic objective). TVET is understood as comprising education, training and skills development relating to a wide range of occupational fields, production, services, and livelihoods (Chinedu & Olabiyi, 2015). TVET, as part of lifelong learning, can take place at secondary, post-secondary and tertiary levels and includes work-based learning and continuing training and professional development which may lead to qualifications (Government of Bhutan Thimphu, GBT, 2014). The primary objective of TVET is to train youths and adults alike, equipping them for the labor market.

With the technical revolution and innovations in science and technology, labor market needs have significantly progressed. New challenges must be met to match the

education proposed with vocational demands (GBT, 2014). The purpose of TVET is to equip young men and women with the technical and professional skills needed for the socio-economic development of the country. The emphasis is on training people for self-employment. TVET institutions need to anticipate and respond to the skill changes needed for successful careers in industrial economies. Thus, it will help to assess the demand for skills and training needs for occupations in engineering and construction industries, in this way providing insights that will contribute to effective training and education policies that lead to recommendations for policy and approach options for the government to strengthen skills training systems. The policy can be explained as an explicit or implicit single decision or group of decisions which may set out directives for guiding future decisions, initiate or retard action, or guide implementation of previous decisions (OECD, 2014).

Policymaking is the first step in any planning cycle and planners must appreciate the dynamics of policy formulation before they can design implementation and evaluation procedures effectively (UNESCO-UNEVOC, 2013). Indeed, planning entails a variety of processes, from the analysis of the present situation, the generation, and assessment of policy options, to the careful preparation and monitoring of policy implementation, eventually leading to the redefinition of a new policy cycle (GBT, 2014), the policy process is a crucial element in any educational programs, especially in TVET. The Nigerian policy on education which is the blueprint of educational policy is a nationally derived ideal and aims that are supposed to guide and direct the educational development of the country based on two key features. Firstly, the policy indicates the direction for the future and secondly, it gives direction for options for future actions.

Several policy choices can be identified using the equity lens which may help overcome the barriers preventing individuals access to TVET, some of which according to Chinedu & Olabiyi (2015) include: ascertaining main concern (target) groups, and which policy approaches may be most effective to reach those concern group and supporting better transitions to work for the most are in need, others include

working with employers to improve workplace training and to develop comprehensive workplaces and securing collaborative approaches to achieve objectives of TVET programs, also, teacher training policies should take into consideration barriers preventing teachers from actively contributing to TVET reforms and participating and investing in lifelong learning. Immediate measures to reward teachers and trainers may work in the short term, however using the transformative lens would suggest promoting teachers' participation in decision-making processes, developing career management and improving support to career progression (Lai, Adib, & Lee, 2018)

Current debates and activities in the area of TVET curriculum development and implementation reflect a wide variety of issues and subjects, ranging from gaining basic skills that require few materials and little investment to vocational content in higher education (UNESCO, 2015). Curricula are formally specified in such learning and teaching entities as units, courses, clusters, sequences, and other specifications. The curriculum for TVET is developed to offer complete training in general education and occupational areas. The curriculum in TVET is the totality of those experiences, knowledge, skills, and activities systematically planned to educate youth for gainful employment in their chosen occupation or cluster of occupations (Olabiyi, 2018). TVET curriculum is a plan for training designed to provide a complete set of learning experiences including workshop, classroom, experiential and self-guided training delivery recommendations that will lead to the achievement of a desired set of competencies (UNESCO, 2015). The intended school curriculum is expressed in policy documents, curriculum frameworks or guidelines, frameworks of standards and assessment, syllabi, textbooks, and other instructional materials and clearly defines the structure, content, and methods of intended learning experiences (UNESCO-IBE, 2016).

The intended curriculum according to UNESCO-IBE (2016) is then put into practice through real teachers interacting with real students in real schools. Implementation of the TVET curriculum requires a holistic approach that takes into consideration the curriculum

content, teaching materials, machinery, and equipment as well as industrial participation with the emphasis on digging down into the basics of TVET programs. It is important to note that curriculum implementation cannot take place without the learner; the learner is, therefore, the central figure in the curriculum implementation process. Implementation takes place as the learner acquires the intended experiences, knowledge, skills, ideas and attitudes that are aimed at enabling the same learner to function effectively in a society. (GBT, 2014) Technology practitioners in this study refers to TVET lecturers in higher institutions who develop, plan, teach and evaluate curriculum in order to develop required skills in students while organized private sectors according to Olabiyi and Chinedu (2018) consists of those businesses and industrial set-up where government participation by way of ownership is zero or near zero percent, they are businesses initiated, funded and managed by private individual or groups. They cut across all the sectors of the economy including agriculture, commerce, manufacturing, mining, and services.

Statement of the Problem

The most vital aspect for the success of the educational development of any nation is a well-planned, articulated and implemented curriculum that is designed to be taught and learned in schools to elevate social consciousness and bring about economic viability. TVET is arguably the most difficult education subsector to govern and manage because of the complexity in number and type of organizational sponsors, diversity of clients, varied types of delivery, and changing labor market demands, at the central level, unclear or inappropriate policy affect the sector, mandates for the various supervisory organizations tend to be ill-defined (Olabiyi, 2018). Several key TVET organizations, particularly national training councils, lack the resources to carry out their functions. Ali; Muhammad, Azlan, Amirmudin, Muhammad, and Yahya (2012) observed that the non-directional educational policy is the soul bane of the entire educational system of the country with a specific reference to the structure of the curriculum and that curriculum planner who does not understand how policies are formulated are not ensured of

success; neither can they be of great help to policymakers.

The expectations of the teachers, parents, schools, and industries, are not met which also signifies the obvious reason for lack of technological development in the country as a result of lacking in terms of achieving the desired objectives of TVET and national goals. Ezgi (2012) emphasized that lack of commitment from the government agencies and the industries ineffective implementation of TVET policy contributes towards the failure of the system. ILO (2012) suggests that countries need to have policies to support inclusive enrolment into science, engineering and other types of TVET programs and ensure effective implementation of the curriculum towards realizing the objectives of TVET. Only in this way can potentially severe economic and social adjustment costs will be avoided and employment growth potential is seized ILO added.

Purpose of the Study

The major purpose of the study is to determine innovative policies for the implementation of the TVET curriculum in developing student's competencies for sustainable industrial development in South/West, Nigeria. Specifically, the study determines:

- a) TVET policy objectives required to develop students' competencies;
- b) The innovative strategies to help students achieve key policy goals of TVET programs towards sustainable industrial development.

Research Questions

- a) What is the TVET policy objectives required to develop students' competencies towards sustainable industrial development?
- b) What are the innovative strategies to help students achieve key policy goals of TVET towards sustainable industrial development?

Hypotheses

The following null hypotheses were tested at 0.05 level of confidence:

Ho₁: There is no significant difference between the mean responses of TVET practitioners

and the organized private sector (OPS) employers regarding the TVET policy objectives required to develop students' competencies towards sustainable industrial development.

Ho₂: There is no significant difference between the mean responses of TVET practitioners and organized private sector (OPS) employers concerning the innovative strategies to help students achieve key policy goals of TVET towards sustainable industrial development.

Methodology

The study employed a descriptive survey research design. The study was guided by two research questions and two hypotheses. The population consists of 147 made up of 62 TVET practitioners and 85 organized private sector employers in south/west, Nigeria were randomly selected to participate in the study. The instrument for data collection was a structured questionnaire. The instrument had three sections A to C. Section A sought information on personal data of the respondents such as gender and place of work. Section B to C sought information on the three research

questions. The questionnaire was subjected to face validation by three experts from the Department of Science and Technology Education, University of Lagos. The internal consistency of the instruments was determined using Cronbach Alpha, with an alpha value of $\alpha = .85$. The instrument was administered to the respondents through research assistants and personal contact. Out of 147 questionnaires administered, 118 were duly filled and returned to the researchers. These represented an 80.3 % questionnaire retrieval rate. Data generated from the questionnaire were analyzed using mean and SD to answer research questions. Any item with the mean value of 3.50 and above was considered as accepted, while any item with the mean value of less than 3.50 was considered as not accepted. While independent t-test was used to test hypotheses at a 5% level of significance, through the Statistical Package for Social Sciences (SPSS) version 20. Any item where the calculated significance value is greater than .05%, the hypotheses of no significant difference was upheld, but where the calculated significance value is less or equal to .05, the hypotheses of no significant difference was rejected at .05% level of significance

Results and Discussion

Table 1: Mean and SD of TVET Practitioners and OPS Concerning Policy Objectives required to Develop Students' Competencies towards Sustainable Industrial Development

NO	Item statements	Mean	SD	Decision
1	Identify policy to ensure coordination from planning to implementation stages to smooth the pace of training of competent workers to avoid serious skill shortages.	3.91	.81	Agree
2	Provide resources to retrain and focus on the development of transferrable skills utilizing active labor market policy measures.	3.79	.46	Agree
3	Develop frameworks structures for human resources involving government, employers, and TVET providers to facilitate manpower development.	3.80	.61	Agree
4	Formulate industrial policy included retraining of workers in cooperation with the manufacturing association of Nigeria,	3.84	.85	Agree
5	Setting up task forces to monitor TVET programs by incorporating the skills and competency required for manpower development.	3.89	.40	Agree
6	Formulate policy objectives to improve resource allocation to make TVET programs more efficient to achieve industrial sustainability.	3.71	.45	Agree
7	Develop a rigorous approach to the analysis and anticipation of demand for competent manpower for new job skills in business and industries.	3.69	.46	Agree
8	Policy-makers should Identify constraints to access, participation and progression in TVET programs.	3.91	.40	Agree
9	Formulate policy to steer skills development on the employment potential of the economy and the corresponding needs in education and training required	3.88	.67	Agree
10	Determine strategies to improve the image and quality of TVET programs to establish more coherent approaches to lifelong learning.	3.59	.46	Agree

The data presented in Table 1 revealed that TVET practitioners and employer’s in the OPS indicate that the suggested policy objectives required were agreed to develop students’ competencies towards sustainable industrial development: Identify policy to ensure coordination from planning to implementation stages to smooth the pace of training of competent workers to avoid serious skill shortages; develop frameworks structures

for human resource involving government, employers, and TVET providers to facilitate manpower development; setting up task forces to monitor TVET programs by incorporating skills and competency required of manpower development. The items on the scale had mean values ranging from 3.59 to 3.91 which is above the cut-off point of 3.50. This signifies that the policy objectives are pertinent to the development of students' competency towards sustainable industrial development.

Table 1b: Independent Samples t-test statistics of Mean Responses of TVET Practitioners and OPS, Employers, on Policy Objectives required to Develop Students’ Competencies

Variables	N	Mean	SD	Df	T	Sig.
TVET practitioners	58	3.96	.58	73	1.05	0.17
Employers in OPS	60	3.77	.54			

As shown in Table 1b, TVET practitioners had a relatively higher mean score of 3.96 than OPS employers with a mean of 3.77 vis-à-vis TVET policy objectives required to develop students’ competencies. There was no statistically

significant difference between TVET practitioners and OPS mean scores regarding TVET policy objectives required ($t=1.05$ $p>.05$). With this result, the null hypothesis (H_{01}) of no significant difference was accepted at 0.05% level of significance.

Table 2a: Mean and SD of Respondents Regarding Innovative Strategies to help Students achieve Key Policy Goals towards Sustainable Industrial Development

NO	Item statements	Mean	SD	Decision
1	TVET institutions must ensure working with employers to improve workplace training and to develop inclusive workplace skills and secure collaborative approaches to manpower development.	3.91	.81	Agree
2	Incorporate public-private partnerships in TVET programs to improve training resources and' hands-on knowledge of skill relevance and quality to enhance workers competency	3.89	.46	Agree
3	Involving trade unions and manufacturing associations in the planning, design, and implementation of skills development will improve workers competency	3.80	.61	Agree
4	Competency-based training based on occupational standards, the expanded supply of qualified instructors, better use of examination systems and regulations should be adopted towards manpower development.	3.84	.85	Agree
5	The concentration of resources, and the use of competitive training funds through financial aid to lower direct costs to the trainees, and allocation of support through vouchers.	3.79	.40	Agree
6	using enterprise associations to build public-private partnerships, more flexible training supply	3.71	.45	Agree
7	TVET courses should be made more flexible through short-term programs; modular content; local accountability; and continuous, lifelong training.	3.87	.46	Agree
8	Using vocational guidance and counseling can help mesh training supply with market demand.	3.69	.40	Agree
9	Articulate pathways through vocational qualifications, diversification of types of training, and more private provision for those able to afford it	3.58	.67	Agree
10	Disabled learners and gender equity require preferential admissions, for inclusive preparation of manpower towards industrial development.	3.69	.46	Agree

Results of data analysis as can be seen in Table 3a above, TVET practitioners and employers’ in the OPS agreed with all the items in the table. Those items had their mean score

ranging from from 3.58 to 3.9. None of the innovative strategies received a mean score of less than 3.50 and were therefore regarded as innovative strategies to help students achieve

key policy goals of TVET towards sustainable industrial development. The items had their standard deviations ranging from .40 to .81;

thus, indicating that the respondents were close to one another in their opinions and that they were not too far from the mean

Table 2b: Independent Samples t-test Statistics of Mean Responses of Respondents to Innovative Strategies to help Students achieving Key Policy Goals of TVET

Variables	N	Mean	SD	Df	T	Sig.
TVET practitioners	58	3.89	.45	73	1.38	0.17
Employers in OPS	60	3.77	.43			

As shown in Table 3b, TVET practitioners had a relatively higher mean score of 3.89 than OPS employers with a mean of 3.77 regarding innovative strategies. There was no statistically significant difference between TVET practitioners' and employers' mean scores on innovative strategies to help students achieve key policy goals of TVET towards sustainable industrial development ($t=1.38$ $p>.05$). Thus, the null hypothesis of no significant difference was upheld.

Discussion

What is the TVET policy objectives required to develop students' competencies towards sustainable industrial development? Based on the findings of this study, the majority of TVET practitioners and OPS employers are generally in agreement over the TVET policy objectives required to develop students' competencies towards sustainable industrial development. Those objectives considered as pertinent to develop students' competencies includes; setting policy that will ensure coordination from planning, design to implementation stages to smooth the pace of training to provide competent workers for employment to avoid serious skill shortages; develop frameworks structures for human resource development involving government, employers, workers, and TVET institutions to facilitate the exchange of information towards manpower development; understand the employment potential of economy and the corresponding needs in education and training. The result indicated that policy objectives are required to develop students' competencies.

In line with the finding, ILO (2010b) and ILO (2011a) believe that to develop students' competencies will include formulating higher educational requirements for prospective trainees, competency-based training based on

occupational standards, and expanded supply of qualified instructors. The finding also supports the assertion of Lai, Adib, and Lee (2018) that there is need to develop frameworks structures for human resource development involving government, employers, workers, and TVET institutions to facilitate the exchange of information towards developing students competency, government need to formulate industrial policy that will include retraining of workers in cooperation with the manufacturing association of Nigeria. The finding also is in agreement with Olabiyi and Chinedu (2018) who stressed that to bridge the gap between industry requirements and training in TVET institutions, there is a need for TVET institutions to formulate policy, incorporate and use emerging technology tools to transform how TVET graduates are trained to enable a sustainable workforce that meets the needs of the nation.

The first null hypothesis sought whether any significant difference exists between the responses of respondents' vis-à-vis the TVET policy objectives required to develop students' competencies. Consequently, the null hypothesis was accepted ($t=1.05$ $p>.05$). It was therefore concluded that there was no significant difference between the mean responses of TVET practitioners and OPS employers regarding the TVET policy objectives required to develop students' competencies. The findings in respect of hypothesis one support previous study Moustafa and Moustafa (2013) and ADB (2014) who found out that to develop students' competencies will include formulating higher educational requirements for prospective trainees, competency-based training based on occupational standards, expanded supply of qualified instructors, better use of examination systems and regulations.

Findings on the innovative strategies to help students achieve key policy goals of TVET towards sustainable industrial development, respondents identified that: TVET institutions must ensure working with employers to improve workplace training and to develop inclusive workplace skills and securing collaborative approaches to manpower development; incorporate public-private partnerships in TVET programs which match government resources to businesses' hands-on knowledge of skill relevance and quality to enhance workers competency in support of the findings OECD, (2014) and ILO (2015) advocated that TVET courses should be made more flexible through short-term programs; modular content; local accountability; and continuous, lifelong training. The findings also support the assertion of Ezgi (2012) and ILO (2015) who emphasized that competency-based training based on occupational standards, qualified instructors and regulations should be adopted towards improving the competency of the workforce.

The analysis of the t-test between the mean responses of TVET practitioners and OPS employers on innovative strategies showed that the null hypothesis was accepted, ($t=1.38$ $p>.05$). The findings in respect of the hypothesis agreed with the submission of GBT (2014) and Chinedu, Kamin, and Olabiyi (2015) that training implemented properly will ensure that TVET graduates can perform a job to the standard specified; and that they possess and acquire the desired skills, knowledge and attitude required by the industries and employers.

Conclusion

Based on the findings of the study, the conclusion was made that there is need to formulate policy that will ensure coordination from planning to implementation stages. To provide competent workforces for employment on how training of TVET students should be designed and implemented. TVET institutions should identify the knowledge and competency required and develop curriculum that will meet the need of future workers and prioritize training needs and made it accessible to concern people. The innovative strategies to help students achieve key policy goals includes

TVET institutions must ensure working with employers to improve workplace training and to develop inclusive workplaces skills.

Recommendations

Based on the findings of the study, the following recommendations were made:

- a) Effort should be made by the ministry of education in collaboration with administrators in TVET institutions for formulating effective policy that will strengthen the implementation of the TVET curriculum towards achieving objectives of developing students' competencies.
- b) The government should expand investment in TVET programs by making adequate provision for funds and facilities required for effective implementation of curriculum to supply skilled workers to sustain high economic growth.

References

- Ali. I; Muhammad, R. R; Azlan Bin A, L, Amirmudin, B, U, Muhammad S. S, & Yahya B, B. (2012).Implementation of technical and vocational education in post-primary schools in Nigeria: A qualitative approach. *International Journal of Humanities and Social Science Invention 1 (1)* .30-33
- Amitabh Shukla (2017) The Importance of Innovation in Entrepreneurship <http://www.paggu.com/entrepreneurship/the-importance-of-innovation-in-entrepreneurship/> Updated June 14, 2017.
- Asian Development Bank (2014). Innovative strategies in technical and vocational education and training for accelerated human resource development in South Asia.
- Chinedu, C. C. & Olabiyi, O. S. (2015).Empowering Nigerian youths through technical vocational education and training for enhancing national

- security. *Journal of Technical Education and Training*, 7(1), 10-22. Published by Faculty of Education, Universiti Tun Hussein Onn Malaysia: the UNESCO-UNEVOC center in Malaysia.
- Chinedu, C. C., Kamin, Y. & Olabiyi, O. S. (2015). Strategies for improving higher-order thinking skills in teaching and learning of design and technology education. *Journal of Technical Education and Training*, 7(2), 35-43. Published by Faculty of Education, Universiti Tun Hussein Onn Malaysia: the UNESCO-UNEVOC center in Malaysia.
- Ezgi, S. (2012). Human Resource Development Approach to Innovation Capabilities: A Case Study on the Turkish Textile Manufacturing Industry. MSc in Management, Organisations, and Governance London School of Economics and Political Science http://www.unep.org/greeneconomy/Portals/88/documents/ger/GER_synthesis_en.pdf.
- International Labour Office (ILO, 2010b). *Teachers and trainers for the future: Technical and vocational education and training in a changing world*, Report for discussion at the Global Dialogue Forum on Vocational Education and Training (ILO, Geneva).
- International Labour Office (ILO, 20115). *Skill for employment policy brief greening the global economy the skills challenge* (ILO, Geneva).
- International Labour Office (ILO, 2011a). *Comparative analysis of methods of identification of skill needs on the labor market in the transition to the low carbon economy* (ILO, Geneva).
- Lai Chee S., AdibFarhan Z., & Lee Ming F. (2018). Green Skills for Green Industry: A Review of Literature. 1st International Conference on Green and Sustainable Computing (ICoGeS) 2017 IOP Publishing. IOP Conf. Series: Journal of Physics: Conf. Series **1019** (2018) 012030 DOI: 10.1088/1742-6596/1019/1/012030
- Manfred, T., & Jennifer, W. (2004). *Vocational Education and Training key to the Future*. Greece: Colibri Ltd.
- McDonald, G., Condon, L. & Riordan, M. (2012). The Australian Green Skills Agreement: Policy and Industry Context, Institutional Response and Green Skills Delivery. Australia, NSW: TAFE
- Moustafa, M & Moustafa, W (2013). Technical and Vocational Education and Training (TVET) Challenges and Priorities in Developing Countries. www.unevoc.unesco.org/.../TVET_Challenges_and_Pri...
- OECD (2014). *A New Economy: The changing role of innovation and information technology in growth*. Paris: OECD Publishing
- Olabiyi, O. S (2018). Corruption: the bane of effective implementation of technical vocational education and training curriculum towards developing a workforce. A paper presented at the conference Centre University of Ibadan-Oyo state.
- Olabiyi, O.S & Chinedu, C. C (2018). Perception of employers' in transforming technical and vocational education and training vis-a-vis emerging technology tools for sustainable workforce development in Nigeria. *Path of Science: International Electronic Scientific Journal. TraektoriâNauki = Path of Science*, 4(4),5001-5010.

- Roblyer, A., Edward, P. O., & Havriluv, G. (2004). An assessment of the skill needs of industry: a case study of Trinidad and Tobago. *IVETA Conference*, Jamaica. Technology Master Plan
- UNESCO (1995) Fundamentals of educational planning Education policy-planning process: an applied framework. Paris UNESCO: International Institute for Educational Planning
- UNESCO-UNEVOC (2012) Orienting Technical and Vocational Education and Training for Sustainable development View. Synthesis Report Based on 21 Country Studies. Geneva. International Labour Office
- UNESCO-UNEVOC (2013) Glossary: What is TVET -Forum Discussions: "Definitions, 1/07", "Suggestions for Alternative Titles for term Technical and Vocational 8/08", "Virtual Conference: Two pathways, one destination 10/07" 2013-06-10