

RE-ENGINEERING TECHNICAL VOCATIONAL EDUCATION AND TRAINING (TVET) IN MEETING NATIONAL GOALS IN MANPOWER PRODUCTION AND GENERAL EMPOWERMENT OF THE CITIZENRY.

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Abstract

The major purpose of the study was to determine the processes required in Re-Engineering Technical Vocational Education and Training in Meeting National Goals in Manpower Production and General Empowerment of the Citizenry by TVET Institutions. Four tertiary institutions in Enugu State offering Vocational and Technical Education were used to attain the purpose of this study. Four research questions were answered. A descriptive survey research design was adopted in the study which involved 58 lecturers in the four institutions that offer Vocational and Technical Education. Due to the manageable size of the population, there was no sampling. Data were collected by the researchers and with the help of three research assistants using structured Re-Engineering Technical Vocational Education and Training Questionnaire (RTVETQ) with 41 item statements. Cronbach Alpha reliability technique was used to determine the internal consistency of the instrument. The reliability co-efficient of 0.78 was obtained. Analysis was done using mean and standard deviation. The study found that there is structural imbalance and poor system configuration at all levels of TVET education system. The curriculum is not yet responsive to produce the required manpower with requisite skills for smooth transition from school to work. There is still lack of quality in technical teacher education programme and this has created vicious circle of producing students who lack proficiency and competence in their chosen trade. Competent teachers abandon their job for greener pastures in industries because of lack of proper remuneration and incentives. Based on these findings, the study recommended re-engineering of TVET as an alternative strategy for meeting national goals and manpower production and general empowerment of the citizenry.

Introduction

The federal government has realised that Technical and Vocational Education holds the key to the nation becoming technologically relevant and internationally competitive in the world market. According to Okoye and Okwelle (2013), Technical Vocational Education and Training (TVET) is widely recognised as education system expected to produce a competent workforce who can compete and excel in a rapidly changing environment and improves a country's economy. Technical vocational education and training are important instruments that are

available to government and community to prepare individuals for a rapidly-changing increasingly-demanding world of work (Murgor, 2013). Similarly, Wilson in Dambudzo (2012) defined TVET as education and training that prepare persons for gainful employment. TVET is a comprehensive term referring to those aspects of educational process involving in addition to general education, the study of technologies and related sciences, and the acquisition of skills, attitudes, understanding and knowledge relating to

occupations in various sectors of economic and social life (FRN, 2013).

TVET is a major part of technology education. Technology education is regarded as public knowledge, attitudes and skills for making, doing and using things in specifiable and reproductive ways. According to National Master-Plan for TVET development in the 21st century (2000), technology education is the most effective means of empowering the citizenry to overcome poverty, limit the incidence of social vices due to joblessness, and promote a culture of peace, freedom and democracy. Rapid technological change has a rapid influence on TVET. Learning has become lifelong and its foremost skill has become learning how to learn. The task of TVET is to ensure that institutions trained the desired labour force. This will go a long way to ensure that the goals of technical and vocational education will be achieved. The goals of technical and vocational education as stipulated in the national policy on education include; providing trained manpower in the applied sciences, technology and business particularly at craft, advanced craft and technical levels; provide the technical knowledge and vocational skills necessary for agriculture, commercial and economic development; give training and impart the necessary skills to individual who shall be self – reliant economically (FRN, 2013). TVET is therefore charged with the responsibilities of production of human resource for national development.

Human resource is the most critical resource to the development of any nation. Development requires capital investment and technical processes. Capital and technology are inert without human beings, knowledge and efforts. According to Bosah and Eneasator (2006), development involves learning processes of human beings which help to equip them with the skills, knowledge and abilities necessary for the creation of a form of society in which conditions of safety, sufficiency, satisfaction and stimulus prevail. Human resources also

known as manpower refers to the totality of the energies, skill, knowledge and experience available in a nation (Yaro, 2012). It is therefore through education and training that the human resources of any nation can be developed. Again, through education and training, the populace become more enlightened and acquires the skills that will enable them earn a living and generate the wealth for the nation. TVET is therefore, the right type of education that will equip the citizens of any nation such as ours, with the skills, knowledge and ability.

The mission of Technical and Vocational Education in the 21st century as stipulated in FME (2000) include: Production of skilled and technical manpower necessary to restore, revitalise, energise, operate and sustain the national economy. Substantially reduce unemployment; globalise and keep at the growing edge of technology the workforce that is imbued with assertive drive for quality and beauty in performance and for currency in their working life. Be demand-driven in order to maintain its continued relevance and broad-based in nature, accommodating at all periods of life without discrimination or bias on grounds of sex, intellectual talents and aptitudes, physical disabilities or culture, religion or ideology (p.9).

To buttress the above stipulations, TVET shall open to all the opportunities for self – realisation, self-fulfillment in the direction of natural endowments, interest and motivation; have regard for and carry out occupational training as a veritable means of technology transfer among others. The big question then is how far has TVET been able to achieve the missions it sets out? The answers to this question remain a concern to all TVET educators and the researchers. This is because of numerous constraints inhibiting the achievement of these lofty mission which include; structural imbalance and poor system configuration; inappropriate curriculum design and delivery in TVET; poor quality of technology teacher production and retention

strategy; inadequate facilities in TVET institutions.

However, if national goals in manpower production and general empowerment of the citizenry are to be achieved, then structural imbalance and other problems in the present practice in various aspects of TVET observed should be properly addressed. FME (2000) outlined some suggestions for addressing the problems in the present practice of TVET to include:

Review of transition proportion at the end of junior secondary education prescribed for senior secondary, technical college, vocational centre and apprenticeship; number of technical colleges should be increased radically. National curriculum makers in TVET should work in partnership to prepare and harmonise curriculum which should serve to revitalise delivery practice nationwide. Curriculum should be designed to create dynamic workforce that are functional at the growing edge of technology and also enable the practice of lifelong learning (p.24).

This means that no TVET curriculum should be designed as-a-dead-end. There should be constant review of curriculum focusing on the economic needs of the nation and the learners. Curriculum should also be broad-based to guard against narrow specialisation and facilitate job mobility. Another great area that needs to be properly addressed is the rehabilitation and expansion of TVET institutions. Gross infrastructural dilapidation, inadequate staffing and general shortfall in the supply of requisite manpower to meet the national TVET needs have been observed, necessitating massive rehabilitation and expansion. It is necessary therefore, to undertake nationwide rehabilitation of existing facilities and invest heavily in TVET to accommodate higher enrolments. The preparation of new breed of teachers that will translate the new vision of technical and vocational education into action in classrooms, workshops and laboratories and other places for

learning is also necessary. The new breed of teachers should be appropriately motivated for retention purposes through remuneration and incentives. In order to alleviate the challenges and achieve overall objectives of refocusing and revitalising TVET, the need for re-engineering the whole process becomes imperative.

Re-engineering according to Hammer and Champy in Ibezim and Obi (2013) is a fundamental rethinking and radical redesign of business process to achieve dramatic improvement in critical measures of performance such as cost, service and speed. It is also the analysis and design of workflows and processes within and between organisations. The business of TVET in this connection is to equip the youth with skills and opportunities since education is considered the key to effective development strategies. According to UNESCO (2004), technical education must be the master key that can alleviate poverty, promote peace, conserve the environment, improve the quality of life for all and achieve sustainable development. In line with the above stipulation, the re-thinking process must cover specifically, the restructuring of system imbalance and poor configuration facing TVET in Nigeria; provision of curriculum and curriculum delivery that would ensure that the beneficiaries of technical and vocational education have job skills for solving many of Nigeria's socio-economic problems, rehabilitation of facilities and expansion to ensure that students derive maximum benefits from technical and vocational education, quality assurance and certification of new breed of technology teachers that will translate the new vision of technical and vocational education into action in classrooms, workshops and laboratories and other places for learning.

Despite the complexity of the challenges facing TVET, it is clear that continued investment in education is needed as both the driver and strategy for economic recovery. The re-

engineering process in TVET is aimed at improving educational efficiency and innovation with a view to preparing students for the jobs of the future as well as meeting the national goal of manpower production and youth empowerment. According to Westera (2004) innovation is seen as the 'life-blood' of development and economic functioning in societies. The thrust of this study therefore is the re-engineering of TVET education system to create enabling environment for the provision of demand driven skills and innovation.

Purpose of the study

The main purpose of this study is to determine the processes required in re-engineering Technical Vocational Education and Training in Meeting National Goals in Manpower Production and General Empowerment of the Citizenry. Specifically, the study determined the:

1. Structural balance and systems configuration processes required in re-engineering TVET to meet national goal and manpower production.
2. Curriculum design and delivery processes required in re-engineering TVET to meet national goal and manpower production
3. Quality and certification in teacher production and retention processes required in re-engineering TVET to meet national goal and manpower production.
4. Instructional facilities and expansion processes required in re-engineering TVET to meet national goals and manpower production.

Research Questions

The following research questions were formulated to guide the study;

1. What are the structural balance and systems configuration processes required in re-engineering TVET to meet national goals in manpower production?
2. What are the curriculum design and delivery processes required in re-

engineering TVET to meet national goals in manpower production?

3. What are the quality assurance, certification and retention processes required in re-engineering TVET teacher production to meet national goals in manpower production?
4. What are the instructional facilities and expansion processes required in re-engineering TVET to meet national goals in manpower production?

Methodology

This study adopted a descriptive survey research design. The study covers the four tertiary TVET institutions in Enugu State, Nigeria. The population for the study was 58 lecturers in the four tertiary institutions in Enugu State that offer Vocational Technical Education programmes. There was no sample for the study since the population was manageable. The instrument for the data collection is a structured questionnaire titled Re-engineering Technical Vocational Education and Training Questionnaire (RTVETQ) on a five point scale with 41 items developed by the researchers. The instrument was divided into five sections A – E. Section A sought background information of the respondents. Section B ascertained the structural balance and system configuration required in re-engineering TVET to meet national goals in manpower production. Section C consists of items required in re-engineering curriculum design and delivery in TVET to meet national goals in manpower production. Section D determined the quality, certification and retention in TVET teacher production required for the re-engineering process to meet national goals in manpower production and section E obtained information on instructional facilities and expansion required in re-engineering TVET to meet national goal in manpower production. The instrument was validated by three experts from Vocational Technical Education, University of Nigeria, Nsukka. Reliability coefficient of 0.78 was obtained using Cronbach Alpha formula.

The instrument was administered to the respondents by the researchers and with the help of three research assistants. Mean and

standard deviation were used to answer the research questions.

Research Question 1

1. What are the structural balance and systems configuration processes required in re-engineering TVET to meet national goals in manpower production?

The results are presented in Table 1 below.

Table 1: Mean Ratings and Standard Deviation of Respondents on Structural balance and System configuration processes required in re-engineering TVET to meet national goals in manpower production

Statements	x	SD	Decision
Harmonise overall responsibilities of TVET at all levels	4.25	0.46	R
Define clearly the responsibilities of ministries to remove system overlap	4.00	0.00	R
Create Departments and Agencies in Implementing TVET Programmes	3.75	0.71	R
Improve coordination of informal TVET	3.88	0.84	R
Improved Supervision of Private TVET Provision	3.75	0.71	R
Increased governance and accountability measures at intuitional levels.	4.00	0.93	R
Separate board for administration of TVET at federal, State and local government	4.25	0.46	R
Establishment of Industrial Training Advisory Committees to develop Competency Based Training	3.88	0.99	R

The results revealed that the Means were between 3.75 and 4.25 which fall within the acceptance level. Thus, this indicated that all the items are required for the re-engineering

structural imbalance and poor system configuration. The standard deviation also revealed that respondents were not apart in their responses.

Research Question 2

What are the curriculum design and delivery processes required in re-engineering TVET to meet national goals in manpower production? The result is presented in Table 2 below

Table 2: Mean Ratings and Standard Deviation of Respondents on Curriculum design and delivery processes required in re-engineering TVET to meet national goals in manpower production

Statements	x	SD	Decision
Instruction should be learner-skill oriented	3.88	0.90	R
Focusing instruction on learning strategy	4.00	0.54	R
Topics taught should be relevant and built around entrepreneurship	4.25	0.46	R
Illustrations used in classroom should relate to real life situation.	3.75	1.17	R
Constant curriculum reviews to keep abreast of new knowledge and technologies.	3.88	0.84	R
Streamlining curriculum to remove overlaps in different educational programmes.			
Employing different learning tactics to facilitate teaching and learning	3.75	0.71	R

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Work-based learning experiences should be built into the curriculum	4.00	0.00	R
Work-based learning activities such as field trips, apprenticeship, internships should be incorporated in TVET curriculum	3.75	0.71	R
TVET courses should be both theoretical and practical.	4.25	0.46	R
Occupational competencies should be taught to enable students have focus of the requirements of occupation	4.25	0.46	R

The result presented in Table 2 showed that the items listed for re-engineering of curriculum design and delivery were all valid. The Means

showed that they are all required. The standard deviation also revealed that the respondents are very close in their responses.

Research Question 3

What are the quality assurance, certification and retention processes required in re-engineering TVET teacher production to meet national goals in manpower production?

The result is presented in Table 3 below

Table 3 Mean Ratings and Standard Deviation of Respondents on quality assurance, certification and retention processes required in re-engineering TVET Teacher Production to meet national goals in manpower production

Statements	x	SD	Decision
Development of National TVET Qualification framework	4.01	0.84	R
Integration of TVET qualification with Academic Qualifications	3.86	0.95	R
Increase the production of TVET teachers in number and quality in terms of assessment and certification	4.09	0.83	R
Ensure that teachers with requisite qualification teach at the appropriate level in the school system where they are certified to teach	3.92	1.03	R
Training of teachers for Competency-Based Training	0.88	3.97	R
Evolve appropriate means of retaining qualified teachers through motivations and incentives.	3.92	1.03	R
Lecturers competencies must be redefined to efficiently include ICT and pedagogical skills for high quality delivery	3.75	1.05	R
Development of ICT Competency Framework and methodologies	3.71	1.04	R
Adoption of international standards such as the UNESCO Competency framework for Teacher as benchmark	3.92	1.03	R
Participatory needs assessments that involve lecturers and key stakeholders in contextualising standards.	0.90	4.03	R
Validate standards to ensure sound roadmap in planning professional development initiatives.	3.92	0.96	R

The Means of the items listed for the re-engineering of quality, certification and retention in TVET teacher production revealed that the items were valid. The result was further strengthened by the result of the standard deviation which indicated that the responses of the respondents were not apart.

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Research Question 4

What are the instructional facilities and expansion processes required in re-engineering TVET to meet national goals in manpower production?

The result is presented in Table 4 below

Table 4: Mean Ratings and Standard Deviation of Respondents on instructional facilities and expansion processes required in re-engineering TVET to meet national goals in manpower production

Statements	x	SD	Decision
Standardise facilities and equipment for TVET programmes at various levels	4.09	0.83	R
Rehabilitation of classrooms, laboratories and workshops	4.01	0.84	R
Rehabilitation of Vocational Training Centres	3.86	0.95	R
Building of federal technical college in each senatorial district and one polytechnic in each state	3.92	1.03	R
Refurbish the existing technical teacher training colleges	3.97	0.88	R
Provision of modern equipment and tools in good quantity and quality.	3.92	0.97	R
Facilities in schools should be a replica of the ones in the Workplace	3.75	1.05	R
Recruitment of qualified technologists and technicians to handle the equipment and tools	3.71	1.04	R
Regular maintenance of equipment and tools for optimal functioning	3.92	1.03	R
Erecting more structures to house modern equipment and tools	4.03	0.90	R
Appropriate orientation to students towards utilisation of equipment and tools.	3.92	0.96	R

The result presented in Table 4 above indicated that all the 11 items listed for re-engineering instructional facilities and expansions were all required. Their Means ranges between 3.71 –

4.09. Their standard deviation also ranges from 0.83 – 1.05 which also indicated that respondents did not vary much in their responses

Discussion of Findings

The result presented in Table 1 revealed that all the eight items listed for the re-engineering structural imbalance and sound system configuration were all accepted. The findings of this study further revealed that there has been in existence structural imbalance and poor system configuration as part of challenges facing TVET institutions in Nigeria. The findings of this study is in consonance with the findings of Swart, Clarke, Hooker, Palmer, and Wachira (2011) which revealed that there is lack of clear governance and coordination structures for TVET. The author recommended changes in policy and governance at all levels and use of mulit-stakeholder approach as the issues cut across several sectors.

Table 2 contains the analysis of the data on re-engineering curriculum design and delivery in TVET institutions. All the items listed to obtain information on curriculum design have their means within the level of required. This further revealed that the curriculum design and delivery in TVET institutions are not yet work-based to enable learners have focus of the requirement of the occupation they intend to practice on graduation. Work-based learning experiences should be built into the curriculum. The findings of this study is in consonance with the findings of Obi (2012) who found that curriculum should have an integrated design of subject/subject matter specific technologies, human traits and social functions to take care of all the necessary requirement of effective job performance. Also Swart et al (2011) found

that developing competency-based curriculum and integrating ICT as a core curricular subject that cuts across all subject areas, vocational training provision can be made more relevant.

The result in Table 3 also indicated that the items listed for re-engineering the quality, certification and retention in TVET teacher production were all valid. The items include; development of a National qualification TVET framework, increasing production of teachers with uniform assessment and certification, retention of teacher through motivation and incentives etc. This finding is in agreement with Ogbuanya (2010) who explained that professional teachers must be skilled in the selection of appropriate materials in guiding the students to carry successful project, that quality education presupposes quality teaching, which can only be achieved through mastery of the various skills in the teaching components. Table 4 contains analysis of result on responses of respondents of the instructional facilities and expansion required for the re-engineering process. The items were all required, indicating the need to: standardise facilities and equipment for TVET at all levels; rehabilitation of classrooms, laboratories and workshops; rehabilitation of Vocational Training Centres; recruitment of technologists, technicians to man the equipment and tools; regular maintenance of equipment and tools for optimal functioning and hands-on training etc

Conclusions

This study was carried out to determine the processes required in re-engineering technical vocational education and training towards meeting national goals in manpower production and general empowerment of the citizenry by TVET institution. The study identified eight processes required for structural balance and systems configuration in re-engineering TVET, 11 curriculum designs and delivery processes required in re-engineering TVET, 11 quality assurance, certification and retention processes required in re-engineering TVET teacher production and 11 instructional facilities and expansion

processes required in re-engineering TVET to meet national goals in manpower production. The total of 41 items listed for the re-engineering processes were all rated as required. The findings further suggested that TVET has been faced with lots of challenges which include: structural imbalance and poor systems configuration at all levels of TVET education system; unresponsive curriculum in producing the required manpower with requisite skills for smooth transition from school to work; lack of quality in technical teacher education programme which has led to production of students who lack proficiency and competency in their chosen trade; dearth of competent teachers resulting from poor remuneration and incentives. Based on these findings, the study concluded that in order to surmount these challenges facing TVET, there is need for re-engineering the educational processes in order to meet national goal in manpower production.

Recommendations

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

1. There should be clear governance and structures at all levels of TVET institutions and programmes should be streamlined to avoid system overlap.
2. The curriculum of TVET should be broad – based to incorporate competency- based learning and activities for life-long learning.
3. There should be National Qualification Framework for teachers which will spell out the required generic competencies for all TVET teachers in Nigeria.
4. Facilities should be rehabilitated to cater for ill-equipped classrooms, workshops and laboratories to enable hands-on training.

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