EFFECTIVE MANAGEMENT OF TECHNICAL EDUCATION: AN OPTION FOR ACCELERATED DEVELOPMENT IN NIGERIA.

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Abstract
Technical Education offers several opportunities to help developing nations advance economically, technologically and industrially. This paper proffers measures for effective use of these opportunities. A 27-item questionnaire was used to elicit information from technical education and educational management experts selected from 20 Nigerian (federal and state) universities, on the roles technical education plays in achieving national development, factors militating against the effective management of technical education, and on measures that could be adopted to effectively manage technical education in Nigeria. It was found, among others, that technical education fosters creativity and innovations; lack of professional manpower, low morale and poor attitude of management of technical education in Nigeria, are some of the problems militating against management of technical education; and strategies for enhancing effective management of technical

education in Nigeria include private sector participation in funding technical education and the training and retraining of technical education teachers. It was suggested that some aspects of technical education should be made compulsory for all students at all levels of education in Nigeria.

Introduction

Every organism, including man, constantly interacts with the environment, which limits their behaviour and, therefore, the satisfaction of their needs and aspirations, in many ways. For man, his environment limits his behaviour physiologically and economically. Therefore, it influences his life. However, man has an innate ability for far-sighted planning as well as the ability to manipulate symbols and artifacts in order to conceive new designs, new arrangements, and new systems in response to his awareness of the inhibiting factors in his physical and socio-economic environment. This manifestation in man's nature is a technological character (Okafor, 1988).

The Lord God gave man the divine mandate to till and subdue the earth (Genesis chapter 1 verse 28 of the Holy Bible). This implies battling against impediments and inhibiting factors within the cosmic environment of man. One may then ask: how is this technological character being manifested in Nigeria in this era of globalization?

In the developed world order, the effect and influence of advanced technology are ubiquitous. The good standard of living observable in industrialized nations is probably due to the production of adequate goods and services that meet the needs of the people. This, of course, is made possible by technological development solidly founded on planned and effective technical education (Yakubu, 2002).

Economic history reveals that technical education has contributed greatly to the technological, industrial and economic development of most developed countries like Britain, the United States of America and France. Also, the recent upsurge in Asian

countries' economic development is attributed to technical education (Yakubu, 2002).

These nations appreciate the fact that technical education is man's answer to a great deal of his cosmic and environmental limitations. Man's ingenious expression manifests in his projection beyond the limitations of his own faculties, by which he exercises planned controls over some of his environmental impediments.

According to Okafor (1988), the distinction between the primitive man and advanced man is that, whereas the primitive man allows nature to control him, the advanced man kicks against this imposition by nature. For instance, where nature says you cannot fly, the primitive man stays on the ground, but the advanced man devices means to fly; where nature imposes an excruciatingly hot environment, the primitive man sweats and wipes the sweat continually, but the advanced man kicks against it by inventing air conditioners. These achievements and considerable success are made possible by technology through effective technical education.

Statement of the problem

The fundamental problem of developing countries, Nigeria inclusive, is traceable to their technological backwardness, which has given rise to widespread poverty, high rate of unemployment, rising frustration, etc. Rather than embarking on effective technical education, these countries rely heavily on imported, packaged and proven technologies. Even some of the researches embarked upon to locally adapt the imported technologies are mostly done abroad (Yakubu, 2002) probably due to lack of basic facilities in developing countries.

The problem of developing countries seems to lie in their inadequate management of technical education, which should aid them to advance technologically. This is evident from lack of interest most citizens exhibit in technical education issues and in poor administrative practices observed in the few technical schools available, when compared with secondary schools.

Management is the ingredient and force, which enables organization to function. Effective management is the total effort of the organizational members to achieve the organizational objectives. It also implies appropriate application of skills, devices, and techniques to enable the organization achieve certain objectives, which in this case, is the transformation of the country into a technological world, using available resources.

According to the Federal Republic of Nigeria, FRN (2004), technical education is a means of preparing for occupational career for effective participation in the world of work. It is perceived as an instrument for promoting environmental and sustainable development for poverty alleviation. It involves the study of technologies and related sciences as well as acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. To achieve the foregoing, Nigeria, in her National Policy on Education (2004), identified the goals of technical and vocational education as the (FRN, 2004:30-31):

- Provision of trained manpower in applied science technology and business particularly at craft, advanced craft and technical levels;
- Provision of technical knowledge and vocational skills necessary for agricultural, commercial and economic development;
- Giving training and imparting necessary skills to individuals who shall be self-reliant economically.

The achievement of the above objectives is the responsibility of technical education management. This implies effective management sought for by this study.

Purpose of study

The focus of this paper is, therefore, to investigate how technical education could help Nigeria transit from mere assemblers of finished products to designers and manufacturers of high quality goods and

services with minimum socio-economic disruption. The study sought to investigate ways of effective management of technical education in Nigeria, in terms of:

- the roles technical education plays in achieving accelerated economic development;
- problems militating against effective management of technical education in Nigeria; and
- the strategies that could be adopted for achieving effective management of technical education in Nigeria.

Research Questions

The following research questions guided the study:

1. What roles does technical education play in achieving accelerated economic development in Nigeria?
2. What problems militate against effective management of technical education in Nigeria?
3. What strategies could be adopted to achieve effective management of technical education in Nigeria?

Hypotheses

H_{O1} There is no significant difference between the mean ratings of experts in technical education and educational management with regards to the roles technical education plays in achieving accelerated development in Nigeria.

H_{O2} There is no significant difference between the mean ratings of the experts in technical education, and educational management with regards to the strategies that could be adopted to achieve effective management of technical education in Nigeria.

Methodology

Population and Sample

The population of the study consists of all the experts in technical education and educational management in Nigerian universities.

Sample and Sampling Technique

The sample comprised 60 experts in technical education and another 60 in educational management (planning and administration) selected by purposive random sampling from 10 federal and 10 state universities in Nigeria offering technical education and educational management (administration and planning). From each university, six experts (three in technical education and three in educational management) were selected by deliberate random sampling technique, giving a total of 120 subject experts from the 20 universities in Nigeria sampled for the study. The sampling was deliberate because the researchers used only those that were able to supply their e-mail addresses. However, efforts were made to assign equal numbers to each university and to each group of experts limiting the total to 20 universities, 60 experts in technical education and 60 experts in educational management.

Instrument for Data Collection

A researchers' designed questionnaire, titled "Effective Management of Technical Education Questionnaire (EMTEQ), was used to collect data from the experts. The questionnaire has two sections, A and B. Section A collected the demographic data of the respondents, while section B contained three clusters with 27 items used to elicit information from the experts on a four-point rating scale provided for the respondents to indicate their opinions, as follows: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). They were weighted 4, 3, 2, and 1 respectively.

Validation of the instrument

The instrument was face validated by two experts, one in Educational Administration and Planning, and another in Measurement and Evaluation at the University of Nigeria, Nsukka. Their corrections and inputs formed the bases for the modifications on the items of the instrument.

Reliability of the instrument

In order to ensure the internal consistency of the instrument, a trial test was carried out with ten Technical Education experts and ten Educational Administration and Planning experts from two universities not used for the study. Internal reliability for each of the three clusters was computed using, Cronbach Alpha (α) statistics. The computation yielded a reliability index of 0.78 for all the clusters, indicating that the instrument is reliable.

Data Collection

The researchers used the internet services to collect data from the subjects. In other words, the instrument was administered online. This was to save time and cost. The researchers used link persons to reach the subjects and collect back the instrument from them, which were returned through courier services. On the whole, out of the 120 administered, only 104 (86.7%) responded in due time and were returned. They comprised 51 (85%) experts in Technical Education and 53 (88.3%) experts in Educational Administration and Planning.

Data Analysis

Mean scores and standard deviation were employed in answering the research questions. A criterion mean was 2.50 on a four-point rating scale. Any mean score above 2.5 was accepted, while any mean score below 2.50 was rejected. Z-test was used to test the two null hypotheses.

Results and Discussions

The data for answering the research questions and testing the hypotheses are presented in Tables 2.1 to 2.5.

Table 2.1: ***Mean ratings of the respondents on the role technical education plays in achieving accelerated development.***

S/N	ITEMS	TECH. EDU EXPERTS N = 53			EDU. MGT EXPERTS N = 51			TOTAL N = 104		
	Roles of technical education in achieving accelerated development	**X**	**SD**	**Decision**	**X**	**SD**	**Decision**	**X**	**SD**	**Decision**
1	Technical education unemployment through provision of technicians	3.61	0.62	Accept	3.64	0.55	Accept	3.36	0.59	Accept
2.	It nurtures creativity and potentials	3.61	0.61	Accept	3.40	0.51	Accept	3.50	0.56	Accept
3.	Technical education fosters creativity	3.81	1.01	Accept	3.70	0.51	Accept	3.75	0.76	Accept
4.	Technical education enhances the understanding of aptitudes	3.90	0.23	Accept	3.90	0.50	Accept	3.90	0.36	Accept
5.	It enhances innovations	3.70	0.63	Accept	3.80	0.52	Accept	3.75	0.58	Accept
6.	Technical education reduces poverty	3.60	0.84	Accept	3.70	0.51	Accept	3.65	0.67	Accept
7.	Technical education lays foundation for higher technology	3.90	0.20	Accept	3.86	0.31	Accept	3.88	0.26	Accept

All the above seven items were accepted by the experts as the roles technical education plays in achieving accelerated developments.

Table 2.2: ***Means rating of respondents on the problems militating against effective management of technical education.***

S/N	ITEMS	TECH. EDU EXPERTS N = 53			EDU. MGT EXPERTS N = 51			TOTAL N = 104		
	Problems militating against effective management of technical education.	**X**	**SD**	**Decision**	**X**	**SD**	**Decision**	**X**	**SD**	**Decision**
8	Irrational planning and implementation of educational plans.	3.14	0.63	Accept	2.06	0.75	Accept	2.60	0.69	Accept
9	Neglect of the use of indigenous technological resources	2.43	0.76	Reject	2.41	0.64	Reject	2.42	0.70	Reject
10.	Lack of professional trained personnel	3.58	0.78	Accept	3.48	0.66	Accept	3.03	0.72	Accept
11	Poor infrastructure	3.16	0.72	Accept	3.21	0.73	Accept	3.14	0.73	Accept
12	Lack of science equipment and materials	3.72	0.64	Accept	3.76	0.46	Accept	3.74	0.55	Accept
13	Poor budgeting allocation to education	2.06	0.76	Reject	2.51	0.62	Reject	2.29	0.69	Reject
14	Method of lesson delivery is theoretical	3.06	0.78	Accept	3.16	0.70	Accept	3.11	0.74	Accept
15	Use of obsolete equipments	3.27	0.84	Accept	3.06	0.86	Accept	3.32	0.85	Accept
16.	Low morale and poor attitude to technical education in Nigeria.	3.56	0.60	Accept	3.42	0.74	Accept	3.49	0.67	Accept

Out of the above nine items, seven (items 8, 10, 11, 13, 14, 15 and 16 were accepted as problems militating against effective management of technical education in Nigeria while items 9 and 13 were rejected; implying that they are not problems to effective management of technical education in Nigeria.

Table 2.3: ***Mean ratings of strategies to achieve management of technical education in Nigeria.***

S/N	ITEMS	TECH. EDU EXPERTS N = 53			EDU. MGT EXPERTS N = 51			TOTAL N = 104		
	Strategies for effective management of technical education include;	X	SD	Decision	X	SD	Decision	X	SD	Decision
17	Public mobilization and concentration on the countries technological backwardness	2.87	0.92	Accept	2.83	0.92	Accept	2.85	0.92	Accept
18	Providing Guidance Counselors in schools	2.47	0.88	Reject	2.84	0.91	Accept	2.64	0.86	Accept
19	Ensuring adequate infrastructures and facilities for science subjects	3.31	0.68	Accept	3.58	0.68	Accept	3.45	0.68	Accept
20	Emphasizing skill acquisition	3.06	0.72	Accept	3.58	0.68	Accept	2.98	0.88	Accept
21	Making pedagogy of teaching more practical mandatory for teachers at all levels of education.	2.48	0.70	Reject	2.47	0.88	Reject	2.48	0.79	Accept
22	Making concepts technical and vocational subjects in junior secondary schools	2.64	0.84	Accept	2.93	0.95	Accept	3.06	0.84	Accept
23	Attraction and retention of experts in sectional education with attractive remuneration and incentives	2.86	0.89	Accept	2.93	0.95	Accept	2.89	0.92	Accept
24	Involving the private sector actively in the funding of education	3.78	0.48	Accept	3.81	0.99	Accept	3.80	0.74	Accept
25	Training and retaining of teachers in science and technical subjects	3.52	0.64	Accept	3.67	0.78	Accept	3.49	0.67	Accept
26	Encouraging primary school leavers to read technical subjects and become experts	3.36	0.58	Accept	2.81	1.08	Accept	2.59	0.83	Accept
27	Establishment of out-of-school centres for continuing technical education.	2.32	1.04	Reject	2.46	1.08	Reject	2.41	0.06	Reject

From the table it could be observed that items 17, 18, 19, 20, 22, 23, 24, 25, 26, 27 and 26 were accepted by the experts as strategies for effective management of technical.

Table 2.4: ***Summary of z-test between the respondents on roles technical education plays in accelerated development.***

Respondents	N	X	SD	DF	LEVEL OF SIG	Z-CAL	Z-TABLE	DEC
Tech. Edu. Experts	51	3.73	0.60					
Edu. Management Experts	53	3.71	0.49	102	0.05	0.19	1.96	Significant

H_{O1} accepted

It is observable from the table that calculated z – value at 102 degree of freedom and 0.05 level of significance is 0.19. Since the calculated z-value of 0.19 is less than the critical tale value of 1.96, the null hypothesis is accepted.

There is therefore no significant difference between the mean ratings of experts in technical education and educational management on the roles technical education plays in achieving accelerated development.

Table 2.5: ***Summary of z-test analysis of the difference between the mean ratings of the respondents with regards to strategies for effective management of technical education in Nigeria.***

Respondents	N	X	SD	DF	LEVEL OF SIG	Z-CAL	Z-TABLE	DEC
Tech. Edu. Experts	51	3.22	0.76					
Edu. Management Experts	53	3.12	0.92	102	0.05	0.60	1.96	Significant

H_{O2} accepted

It is observable from the table that calculated z-value at 102 degree of freedom and 0.05 level of significance is 0.60. Since the calculated z-value of 0.60 is less than the critical table value of 1.96, the null hypothesis is accepted.

There is, therefore, no significant difference between the mean opinions of technical education experts, and educational planning

experts on measures to be adopted to achieve effective management and utilization of technical education in Nigeria.

Discussion of finds

With reference to research question one, it was found that technical education enhances accelerated development of the society through the following roles; reduction of poverty and unemployment; production of technicians: nurturing and fostering of creativity: enhancement of the understanding of aptitudes and innovations and laying foundation for higher technology. These findings agree with the goals of technical education to give training and impart the necessary skills for the production of technicians, technologists and other skilled personnel who shall be enterprising and self reliant" and "to give exposure on professional studies in the technologies".

The findings equally agree with the view of Yusuf and Omotayo (2002) that poverty can be alleviated through vocational skill development. The findings agree with the view of Okafor (1988) that technical education enhances creativity because it nurtures and fosters it. There is no gain saying that technical education properly conceived and applied will contribute phenomenally to a nation's economic development. There are many problems facing Nigeria which demand urgent solutions.

Answering the second research question, the study found that some of the problems militating against technical education in Nigeria include; irrational planning and implementation of education plans; lack of trained personnel; poor infrastructure; lack of science equipment; poor method of lesson delivery; use of obsolete equipment, and low morale and poor attitude to technical education in Nigeria.

These findings agree with the findings of Ogwo (1996) that equipment for technical subject are not supplied with spare parts and that some equipment are outdated, while books on the subject for practical guide and activities are inadequate. The findings equally agree with that of Okoro (1993) that the technical subjects are not taught the way they should be taught because of lack of teachers

adequately trained to teach these subjects. These findings also support the observation of Jimo-Kadiri (2002) that teacher effectiveness and student's motivation in technical education have been more or less non-existent due to lack of books and other materials such as inadequate school buildings, inadequate teachers/instructors in terms of quality and quantity, as well as inadequate funding of the education sector. The findings also share the view of Anakobe (2002) that poor funding, use of obsolete equipment, inadequate and deteriorating facilities, inadequate number and ill-trained teachers, and poor status of library and research facilities and poor job opportunities are the problems facing technical education. The graduates of technical education in Nigeria, therefore, leave much to be desired in terms of skill acquisition which may be attributed to inadequate personnel and other resources.

It is interesting to note that poor budgetary allocation do not constitute a problem. This is probably because the problem may not be with budget allocation but with the actual release of the funds allocated. More often than not, what is allocated differs significantly from is released. No wonder the experts agreed that there are problems of poor infrastructure, lack of equipment and professionally trained management and technical education experts in Nigeria.

The answers to the third research question, as found in table three indicate that the measures to be adopted for effective management of technical education in Nigeria include; mobilization and sensitization of Nigerians; provision of Career Guidance, Counselors in schools; provision of adequate infrastructures for science subjects; emphasizing skills acquisition; emphasizing technical and vocational subjects in junior secondary; provision of text books and instructional materials; involving the private sector actively in the funding of education; training the re-training of teachers in science and technical subjects, and encouraging primary school leavers to read technical subjects and become expert technicians and technologists.

These findings agree with the suggestions of Yakubu (2002) that improvement in teaching and learning of technical education calls

for mobilization of concerted efforts and resources through public mobilization for concerted efforts of government (federal, state and local), community leaders, voluntary agencies, NGO's, politicians, technocrats, individuals and corporate bodies. The findings also agree with the views of Anakobe (2002) and Ozioko (2004) that efforts at producing technical teachers should be addressed, that financial attraction should be initiated and sustained to encourage teachers to remain in teaching, and that in-service training, industrial training workshops, and conferences should be regularly organized for technical education teachers.

The results also support the findings of Ukoha (1994) that in-service training, industrial training workshops and conferences should be organized regularly for technical education teachers. The findings equally agree with the recommendations of Idika and Iwuanyanwu (2002) that products of technical colleges should be involved in the Youth Employment Scheme (YES) to concretize the transition from school-to-work scheme, that adequate funds should be provided, that vocational guidance should be provided for students, and that private sector should help to finance technical education.

Nigeria should redirect her attention, efforts and resources towards making technical education effective so as to gain through technological advancement. The present laissez-faire attitude towards technical education has made Nigerians feel that technical education is for second-class citizens and unintelligent students.

Conclusion, Implications and Recommendations

Technical education gives the student great opportunities in manipulating his skills which invariably leads to socio-economic, techno-industrial and political power. The foundations of the solution to such problems like unemployment, lack of basic amenities, housing, communication, transportation, and health care services which stare the citizens of Nigeria in face which cannot be found in technological developed world are laid by technical education.

Nigeria as a developing nation is faced with the problems of nurturing and rehabilitating her internal workforce fostered through technical education. Without proper planned and systematically applied technical education, the nation will perpetually depend on the importation of foreign technological know-how with the resultant perpetuation of mental colonialism. Through proper orientation of citizens especially in the imperatives of technical education, our citizens will acquire skills in the various rudiments of technology needed for survival in everyday life using simple tools and machines.

Recommendations

The study recommends that:

1. Essential aspects of technical education should be made compulsory to students at all levels of education in Nigeria. This will help raise morale and give positive attitude towards technical education in Nigeria.
2. Technical education teachers should be givien training and re-training intermittently to meet up with modern technologies of the developed world.
3. Innovation and creativity should be encourage and rewarded at all levels and endeavours.

References

Anakobe, O. O. (2002), "Focus on technical education in Nigeria: Aspiration, perception and realization," in Oriafifo, S. O.; Nwaokolo, P. O. E.; & Igborgbor, G.C. (eds.) *Refocusing education in Nigeria,* Benin: City: Da-Sylva Influence.

Federal Republic of Nigeria, FRN, (2004), *National Policy on Education* 4th ed., Lagos: NERDC.

Idika, N. & Iwuanyanwu, E. N. (2002), "Repositioning technical and vocational education in Nigeria for optimum performance," in Oriaifo, S. O.; Nwaokolo, P. O. E.; & Igborgbor, C. C. (eds.) *Refocusing education in Nigeria,* Benin City: Da-Sylva Influence.

Jimoh-Kadiri, S. O. (2002), "Refocusing technical education in Nigeria: The way forward," in Oriaifo, S. O.; Nwaokolo, P. O. E.; & Igborgbor, C. C. (eds.) *Refocusing education in Nigeria,* Benin City: Da-Sylva Influence.

Ogwo, B. A. (1996), "Material resources state for the study of introductory technology practical in Benue state schools," in Eze T. I. & Esimonu, N.P.M. (eds.) *Social and economic implications of vocational and technical education for technological development in Nigeria,* Nsukka: *Nigerian Vocational Journal*, 139-147.

Okafor, F. C. (1988), *Nigeria teacher education: A search for new direction,* Enugu: Fourth Dimension publishing Co. Ltd.

Okoro, O. M. (1993), "The teaching of introductory technology in Nigeria secondary schools," in Anyakoha, E. U. & Osuala, E. C. (eds.) *Vocational/Teaching education and self reliance,* Nsukka: *Nigerian Vocational Journal*, 153-159.

Ozioko, A. N. (2004), "The extent of the implementation of introductory technology programme in secondary schools in Enugu state," *Unpublished M.Ed. Project*, Department of Educational Foundations, University of Nigeria, Nsukka.

Ukoha, U. A. (1994), "Areas of difficulties in introductory technology curriculum as perceived by introductory technology teachers" in Anyakoha, E. U. & Osuala, E. C. (eds.) *Nigerian Vocational Journal*, 7: 104-112.

Yakubu, M. A. & Omotayo, K. A. (2002), "Refocusing technical education in Nigeria: in Oriafor, S. O..; Nwaokolo, P.O.E.; Igborgbor, G. C. (eds.) *Refocusing education in Nigeria*, Benin City: Da-Sylva Influence.

Yakubu, M. A. & Omotayo, K. A. (2002), "Refocusing vocational education and poverty alleviation," in Oriafo, S. O; Nwaokolo, P. O. E.; & Igborgbor, G. C. (eds.) *Refocusing education in Nigeria*. Benin City: Da-Sylva Influence.