

Article

Technical education and its challenges in Nigeria in the 21st Century

V. O. Uwaifo

Department of Vocational and Technical Education, Ambrose Alli University, Ekpoma, Edo State, Nigeria.
E-mail: vuwaifo@yahoo.com.

Accepted 12 October, 2009

Technical education deals with the training of technical personnel for the purposes of initiating, facilitating and implementing the technological development of a nation and also to create the basic awareness of technological literacy to our youths. In Nigeria, the training of technical personnel has witnessed formidable challenges ranging from poor funding to inadequate facilities both quantitatively and qualitatively, non-availability of adequate human capacity, brain drain and poor staff training and retention profiles. Others include weak university/industry partnership, defective curricula, traditional approach to teaching, poorly equipped laboratories, poorly monitoring standards for the training of prospective technologists and an inadequate ICT environment. This paper intends to critically examine why Nigeria has not attained the desired standard of technological literacy in the 21st century and suggest ways of improving the teaching and learning of technical education programme with enhanced enthusiasm and vibrancy.

Key words: Technical education challenges.

INTRODUCTION

Technical education is the training of technically oriented personnel who are to be the initiators, facilitators and implementers of technological development of a nation by adequately training its citizenry on the need to be technologically literate, leading to self-reliance and sustainability. Technical education more than any other profession, has more direct impact on national welfare. Technical education contributions are widespread and visible ranging from metalwork technology, mechanical/ automobile technology, electrical and electronic technology, building and woodwork technology etc. Consequently, Technical education can serve as change agents not only for technical systems but also for many other societal changes. The practical nature of Technical education makes it unique in content and approach, thereby requiring special care and attention. The inputs of Technical education are so visible to the extent that even an illiterate could see when 'failures' occur.

Technologists are supposed to solve societal problems in sustainable ways. For them to do so, they need to be sufficiently informed in technical education concepts and its application of its theoretical principles to practical problems. The desire of the stakeholders to achieve this has been met by lots of challenges. Our inability to tackle

the challenges over the years in Nigeria has put us at a low level in technology and has perpetually made Nigeria a developing nation. The difference between developed, developing and undeveloped countries rests on the ability of the developed countries to convert scientific ideas to useable technology while the developing and underdeveloped countries are yet to effectively do so.

MAJOR CHALLENGES IN TECHNICAL EDUCATION

The challenges mitigating the training of technical education personnel are many but a few of the major ones are highlighted below:

Funding

Universities in Nigeria are owned by the Federal and State governments and recently Private individuals. The Federal and State governments' universities rely predominantly on the governments for funding while the private universities obtain their incomes from the fees they charge the students. Other sources of revenue are

endowments, investment income, grant and gifts. Over the years, governments' subventions to universities have never been adequate but at the same time governments maintain the policy that universities should not charge fees it deemed adequate to complement the financial effort of the Government.

In Nigeria, the allocation to education as a share of GDP, has drastically increased since the inception of a democratic government in 1999. Then, the Federal Ministry of Education's recurrent budget was 38.3 billion Naira (US\$300 Million), in 2006, the Ministry was authorized to spend 129.2 billion Naira US\$1.0 Billion). The real value of the 1999 budget expressed in 2006 Naira purchasing power was approximately 84.6 billion Naira (US\$662 million). Therefore, the purchasing power of the Federal Ministry of Education increased by about 53% over eight years (African Human Development Department, 2006).

However, because of the increase in the demand for technical education and existing high decadence in the infrastructure, the little effect of the increase in funding could not be noticed substantially. Till date, Government funding of technical education programme has not been impressive as this is a reflection of the non-challant attitude of the government towards the programme. This is responsible for the gradual extinction of this programme from the various educational institutions in this country.

Facilities

Most technical education departments in Nigeria Universities do not have laboratories or workshop space let alone usable equipment and facilities and where they exist, they are grossly inadequate, as the laboratories only have the items or equipment that were provided when the departments were established. It is however most surprising to know that most technical education departments still depends on engineering workshop and lecturers to teach technical education concepts in this 21st century. This is a total shame and a high degree of irresponsibility on the part of the operators of this programme. The available facilities programme as at today are inadequate quantitatively and qualitatively and besides they are obsolete. Oryem-Origa (2005) indicated that only 40% of Institutions of Higher Education in Nigeria have laboratory or workshop space for technical education programmes.

The laboratories only have the items or equipment that was provided when the universities were established. programme. The others, 60% do not have laboratory or workshop space and that this reflects the low quality of technology programmes in higher institutions. He further noted that these few universities that have laboratories experience acute shortage of laboratory equipment and supplies. He concluded that this situation is partly

responsible for the reason why it has been increasingly difficult to run experiments effectively for students and made the teaching and research in science and technology difficult and therefore the country was producing insufficient and ill-prepared technical education graduates necessary for driving the technological and socio-economic development of this nation.

The inadequacy in teaching, laboratory and workshop facilities has contributed to the diminution of the quality of technical education graduates in Nigeria. Reyes-Guerra (1989) categorized students into three, namely: Verbalizers, Visualizers and Doers. The Verbalizers are those who learn easily if information is in written or spoken form. They benefit from lectures, tutorials and hand-outs. Visualizers learn easily when information is presented in pictorial or diagrammatic form while the Doers learn more easily when information is presented by practical demonstration by the lecturers.

The inadequacy of facilities both qualitatively and quantitatively has put the visualizers and the doers at a disadvantage. The verbalizers may also have problem in a class with large students' population. The implication of this scenario is that only a small proportion of the students benefit from the current pedagogical system.

There is dearth of ICT facilities for the training of students. The high cost of computer and teaching aids ownership is a major constraint to acquisition of the items. Access to affordable and reliable internet connectivity is only available in a few institutions, faculties and offices, even then, power fluctuations have considerably reduced the reliability of the access and inadequate bandwidth also makes access difficult.

Brain drain

In the context of this paper, brain drain refers to the movement of lecturers of technical education which are needed for the socio-economic and technological advancement of Nigeria from one university to other universities or to other professional (including politics) calling for better conditions of service. Akintunde (1989) identified five different components of brain drain:

- i). Experts in academics who moved to the industry where they get better pay for their services.
- ii). Lecturers and students who leave the country to acquire more knowledge and skill but later refused to return.
- iii). Lecturers who move from one country for better conditions of service.
- iv). Skill professionals who abandon the practice of technical education in favour of other more lucrative economic activities and political appointments which are not related to their training.
- v). Skilled professionals, although in their field of training, who do not devote their full attention to their job because

Table 1. Shows the relative percentage of academic Staff with PhD in technical education across the southern universities in Nigeria as at August 2009.

Names of University	Course areas			Total	No of PhD holders	% age
	Building/ wood work	Electrical/ electronics	Metal/auto mechanic			
1. Nnamdi Azikiwe University, Awka	5	4	4	13	2	18
2. University of Benin, Benin City	5	4	6	15	2	15
3. University of Nigeria, Nsukka	6	4	5	15	5	35
4. University of Uyo, Akwa Ibom	3	5	5	13	3	20
5. Ambrose Alli University, Ekpoma	6	4	3	13	1	9
6. Delta State University, Abraka	5	4	4	13	2	18
7. Enugu State Uni. of Sci. and Tech., Enugu	5	4	3	12	2	20
8. River State University of Sci. and Tech., P/H.	5	3	5	13	2	18
9. Ebonyi state University, Abakaliki	4	5	4	13	2	18
Total	44	37	39	120	22	

* Author's input.

of their efforts to supplement their earnings through other unrelated economic activities.

In the 70s, Nigerian universities were able to attract experts from other countries e.g India because the economic conditions then were favorable. But with down turn of the economy and consequences of the ineffective efforts of the government to resuscitate it, this resulted in the return of the foreigners to their countries and exodus of their Nigerian counterparts from the shores of Nigeria in order to earn a better living.

Bassi (2004) reported that:

- i) About 45% of all Nigerian Professionals including technical educators have left the Nigerian shores over the decades since colonization.
- ii) Between 1997 and 2007 alone, Nigeria lost over 10,000 middle level and high-level managers to the western economies.
- iii) About 500 Lecturers from Nigerian universities continue to emigrate each year, particularly to Europe, America and other African countries where the condition of service is relatively better. These Nigerian in diaspora contribute 35 times more wealth to Europe, American and other African economy.

Staff training and retention

The training of academic staff is ordinarily a continuous exercise to ensure consistent improvement in the quality of their outputs. The training is in two-fold: training to acquire minimum qualification (PhD) to teach and continued professional training. Both types of training can be acquired either locally or overseas. Usually, local training within the nation is cheaper than overseas training but more strenuous because of inadequate facilities, literature and distractions arising from the need to meet

the necessary demands. Overseas training requires a lot of foreign exchange but the enabling environment exists to achieve success in a record time. However, over time it has always been difficult to get the trainees back to their respective countries after the completion of their study.

In the 70s the Nigerian universities were able to recruit foreigners and retain them and the indigenous academic staff because of the low exchange rate. Then, one US dollar (\$1.00) was equivalent of seventy kobo (70k). But now that a dollar (\$1.00) exchanges for one hundred and fifty naira (₦150.00) provides good attraction to move out. This is not to say that salary is the only issue, self fulfillment in terms of output via research efforts is also part of the driving force. The salary and service benefits paid to technical education teachers in Nigerian is about the lowest in the world and because of this, they migrate to other countries especially the United States of America, or local industry for better pay. Academics from within and outside Nigerian also migrate to Botswana and South Africa because of high wages that they pay to the academics and the relatively better equipped laboratories.

Staff situation

Many universities across the country are inadequately staffed both qualitatively and quantitatively. In most departments especially in technical education programme, the proportion of staff without PhD out numbers those with PhD. Uwaifo (2005) asserted that it is difficult to get people trained to the level of PhD because academic is not as attractive in commensurate to the effort, commitment and finances put in to acquiring it, whereas a first degree graduate can function well in the industry and politics etc and earn good money.

It could be seen from Table 1 that no department

offering technical education in Nigerian Universities have adequate PhD lecturers, as the university with the highest PhD lecturers is the University of Nigeria, Nsukka, established in 1960. Of the 15 lecturers in the department, only 5 of them have their PhD, while others are yet to acquire it. Most lecturers in technical education departments in these schools who have obtained their PhD, have been drained away from these schools because of the unattractive nature of the lecturing profession in Nigeria.

In order to spur locally needed Science and Technology activities, it is imperative that Nigeria governments should seriously consider proper retention schemes for their best talents by providing special working conditions including income supplements and adequate research supports to stem this problem of brain drain.

THE CURRICULUM OF TECHNICAL EDUCATION

The curriculum of a subject with practical content is generally organized into an average of 67% for the theoretical classes and 33% for laboratory. Students also use the laboratory to develop case examples on their own time. Olunloyo (2002) noted that one of the issues confronting the design of appropriate curriculum for technical education is preparing students for the shift from the fordist to ICT paradigm in technology practice.

The low pace of industrialization and technological growth in Nigeria can be attributed to the widening gap between Science and Technology as a result of inability of technical education programme to adequately utilize the scientific-ideas to promote technology. This suggests the need to overhaul technical education curricula in the Nigeria.

The overhauling of the curricula may not necessarily translate to the production of highly literate technical education experts or ready-made graduates for the industry industry which may result in rapid industrialization or growth in the economy of a nation unless solutions are proffered to some constraints that may militate against positive outcomes, but will adequately equip our youths the relevant skills needed for their day to day living.

The problems associated with the current curricula are:

- i) They are based on a foreign model which has evolved under ideal conditions (staff, equipment, infrastructure, training opportunities, etc) that are not easily duplicated in developing countries.
- ii) There is usually a shortage of highly competent indigenous teaching and support staff with sufficiently wide practical experience of technology.
- iii) There are basically lack of textbooks in this area and most of the available textbooks are often illustrated with examples from outside the local environment and which are irrelevant to the particular country.
- iv. The curricula are adjudged to be too academic and

overloaded with intellectual content in pure science and mathematics at the expense of basic engineering and technology.

v. Inadequate provision for humanities, social sciences, business management concepts and entrepreneurship skills development, because of the inadequate preparation of the students for the industry, some employers retrain the graduate to make them productive in their organizations.

The teaching approach follows the conventional method of transferring knowledge across through the lecturer reading out to students, who would then take down notes. The educational system continues to place considerable value on this method of teaching.

Jimngang (2004) indicated that in Nigeria, there is need for a total overhauling of the educational system and that in many fields course work available only lead to rising unemployment, poverty and misery. He concluded that the situation could only be curbed if syllabuses were innovated, re-engineered or re-designed to include disciplines that build up the fighter-spirit needed for today's ineluctable battles of life.

POLITICAL SITUATION

Education generally, including technical education programme has been grossly neglected in Nigeria. Technical educators have the greatest challenge of convincing the law makers on why the law makers should give priority to the programme in allocating resources. Many options of getting positive results have been advocated at different forum, namely, lobbying, participation of technical educators in governance, wooing, etc. Yet the government is playing a lopsided attitude to the proper development of the programme in Nigeria. Anyway, let it be made loud and clear that until they begin to change their attitude towards the programme, Nigeria will ever remain a technologically backward and dependent nation.

Conclusion

For progress to be made in Nigeria the challenges confronting technical education must be recognized and fought vigorously. Adequate resources should be allocated to the programme in order to achieve positive outcomes. A comprehensive reform toward technical education and a deliberate attempt to uplift the programme is the only panacea to a technological nderado in this country.

REFERENCES

Africa Human Development Department (2006). 'Nigeria Science and

- Technology Education at Post-Basic Level (STEP B) - Review of Science and Technology Education in Federally-Funded Institutions' Nigeria Country Office, Nigeria.
- Bassi SY (2004). 'The Role of the Directorate of Technical Cooperation in Africa (DTCA) in Technology Transfer and Acquisition in African Countries' proceeding 2nd African Regional Conference on Engineering Education, University of Lagos, Nigeria 20th - 22nd September, 2004 pp. 35-42.
- Olunloyo VOS (2002). 'The Challengers of Globalisation for the Design of Technical Curriculum in Developing Countries' First Edition, University of Lagos Press pp. 217-237.
- Uddin PSO, Uwaifo VO (2005). Principles and Practice of Vocational Technical Education in Nigeria. Benin City. Ever blessed Publishers 2(1): 34-36.
- Uwaifo VO (2005). Vocational Education and General Education, Conflict or Convergence: Niger. J. Educ. Res. 4:1. Institute of Education; Ambrose Alli University, Ekpoma.