NIGERIAN POLYTECHNICS: A SECTORAL APPRAISAL

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Abstract

This exposition starts with the historical note on the growth of polytechnic education in Nigeria. It also highlighted what polytechnics stand for and do in Nigeria. Prospects and constraints experienced in running polytechnic education in Nigeria is outlined. The role of different agencies involved in the running of our polytechnics is critically examined. The Industry - Polytechnic relationship in Nigeria and around the world is peeped into. The polytechnic curricula structure development is looked into. The way forward as a vision of the Nigerian polytechnics in the new millennium is suggested.

Introduction

Available and accessible records show that by the time Nigeria became politically independent, lst October, 1960, there were only three technical Institutions, Yaba College of technology, established in September, 1963, Kaduiia Polytechnic, established in 1968, and Institute of Management an Technology, established in July, 1973. Thereafter both Federal slate and private polytechnics started springing up. Today, we have more than 46 polytechnics. For a polytechnic to promote industrial and technological development it must have three core engineering programmes i.e. civil, electrical and mechanical engineering programmes. On the whole, institutions offering engineering programmes can be summarised as follows:-

* **Civil Engineering - 21 ND + 12 FIND**
* Electrical Engineering - 28 ND + 13 HND
* Mechanical Engineering - 23 ND + 10 HND

Nigeria is a developing country, each of her polytechnics should ideally have the three core engineering programmes, at least at ND level. In reality, however, proprietors of the polytechnics concentrate on offering programmes in Accountancy and Business Administration due to their popularity and the capital intensive nature of engineering programmes. The current situation can be summarised as follows:

* Accountancy - 29 ND + 25 HND
* Business Administration - 30 ND + 28 ND

Nigerian Polytechnics: What They Stand For And Do

The rapid growth in the number of our polytechnics alone, from three by the time Nigeria became politically independent in 1960 to 46 in 1997 is perhaps enough indication of how important we consider the role of polytechnics in our national development. It is certainly in realization of the role of human resources as the ultimate basis for wealth creation of nations that the Federal Government of Nigeria places such a high premium on education, especially technical education.

Although, technological institutions may have some differences in area of current emphasis, they have certain long-term characteristics in common. These include:-

1. They are large institutions which admit large number of students for courses both on full-time and part-time basis.
2. They are institutions offering courses in commerce and communications, Engineering and Environmental studies, business and social studies, sciences, technology, fine and applied arts and basic courses in arts.
3. Courses of study offered lead to the awards of National Diploma and Higher National Diploma,

Full Professional Diplomas, and Certificates. There are also in some of the institutions, courses of study various fields preparatory to external examinations such as ICAN and ACCA, COREN, SURCON etc; while inservice courses are also run for workers **from industry, commerce and the public service.**

Running of Polytechnics Education in Nigeria Prospects and Constrains

To understand the way our Polytechnics are run, it is necessary to examine issues and aims behind the policies and roles polytechnics are expected to play in our development, the problems associated with the implementation of such policies and the prospects for change.

Nations who realize the importance of education spend 20% or more of their Gross Nation Product (GNP) on education alone. In Nigeria today, it is increasingly becoming difficult for Government to meet the financial requirements of higher education. At the same time and expectedly too, it is becoming increasingly difficult for the academic to meet their research, training and infrastructural requirements which are necessary for effective service to the community and country in general in the direction of technological innovation and policy development. Some references could be made to different budget allocations to education sector. For example, Table I illustrates Federal Government's pattern of budgetary allocation to education sector.

Table 1: Federal Allocation (statutory) to the Education Sector As a Percentage of Federal Government's total Budget Expenditure (Statutory), 1994- 1998.

Year	Total Budgeted (Statutory Expenditure (=N= Billion)	Federal Allocation to Education (=N=' Billion	Allocation to Education as Percentage (%) of Total
1994	110.5	8.65	7.83
1995	98.2	12.73	12.96
1996	124.2	15.3	12.32
1997	188.0	21.8	1 1.60
1998	260.0	26.7	10.27
Total (1994-1998)	780.9	85.18	10.91

• Source:- The Guardian, Wednesday, April, 1, 1998

This pattern has remained unaltered for years.

Education With A Vision

Ralph Emerson once said: a scholar is the favourite of heaven and Earth, the Excellency of his Country, the Happiest of men. In Nigeria however, a scholar is not her favourite, nor her excellency. Over the last two decades, we have had an educational system without a vision. When we took over the reigns of government in 1960, did we have any vision or mission for our educational sector, which is the bedrock for socio-political, economic and technological development? Of course not.

There is one key issue that underlines a vision and a national mission, that is, the values which a nation believes in and up holds. National values define those things, which a country believes in. The Americans believe in the protestant work ethnic. The Germans believe in efficiency as a religion. The Japanese believe in pursuing greatness, they chose technological excellence and leadership as their focus. The drive for excellence as a national religion, the pursit of greatness and technological leadership of the world continuously push the Japanese to accept noting but the very best. The government of Japan spends a disproportionate share of its budget on education - not just any education but largely science - based technological and business education.

So successful has this approach been that the corpus of business literature now studies the art of Japanese management. One can easily see the direct link between top rate education as a strategy, technological excellence as a mission, the value of work and global greatness as a vision in Japan.

Education that should have been the bedrock of our national future has been the most neglected sector in Nigeria since 1960. Schools, colleges and university have proliferated adinfinitum without any sense of direction. There are more arts-based graduates in Nigeria today than scientists, yet we want to make the technological leap forward! Existing curricula remain basically weak to the point where Nigerian tertiary Institutions are still using literature discarded twenty years ago in more organised environments. This is not surprising, because the resources to access up-to-date literature

and books do not exist. Worse still, the over-expansion of the educational system has created room for academic miscreants to join the teaching profession.

The solution to start from a clearly defined national vision, progress to a well expressed national mission, base these on a set or core national shared values, articulate concrete goals and solid objectives before tinkering with the educational system. Education is only a strategy to these ends. Our educational system that should evolve must flow logically from the aforementioned issues. How we go about pruning down the over bloated size of the educational sector and funding of what is left becomes essentially a routine

Educating Nigerians For The 21st Century

In the build up to the third millennium, new forces have emerged which are transforming the world as we know it. The forces of globalization, transformations engendered by technology, particularly computers and communications, have brought in their wake new techniques and management. Manufacturing and production in which hierarchies have become de-emphasized as productivity have been enhanced. These emergent factors have changed the rules of economic development and wealth creation. Human capitals embodied in skills and knowledge of the workforce is now a vital resource in wealth creation and prosperity of nations than capital, labour and land. Thus the rules of economic production have not only been changed by technology but technological development has restored the primary function of intellectual capital as the driver of the emerging new information economy of the 21^{s1} Century. Expectedly these changes have impacted n education such that the goals, pattern and role of education in the modern economy have been transformed.

In these changed circumstances, the most important investment that Nigeria can make to remain competitive and relevant in the 21st century is in the education of its citizens because an educated, skilled and well-paid workforce constitutes the basic infrastructure of the new global economy. Investment in education is, imperative. The new circumstances have imposed new demands on the social organisation, orientation and internal logic of education, especially with regard to structure, content and goals. For example, the vital necessity to implant relevant skills in production enforces longer periods of formal schooling for the workforce even as the scientific and technological content of education is substantially increased.

Since its establishment in 1977, the National Board for Technical Education (NBTE) has been trying to ensure qualitative training for technicians and technologists. The Board planned to fully computerize all the institutions under its supervision to compete favourably with rest of the World in the global information revolution. Already Websites have been, establishing at Kaduna Polytechnic, Yaba College of Technology, Federal Polytechnic Nekede. The world has recorded significant and giant strides in Information Technology and in the process has become a global village and many developing countries are striving to join the information superhighway, to keep abreast with recent thoughts, ideas and knowledge. Polytechnics in this regard, are not left behind. The E-mail and Internet will not only aid Polytechnics to keep abreast with technological developments in other parts of the world but will also assist our technological institutions to keep pace with new product and latest research and development in science, engineering and technology. The Board had earlier commenced the provision of Electronic - mail facilities in one polytechnic in each of the 36 states of Nigeria.

Since the establishment of NBTE 23 years ago the Board has developed over 140 curricula at ND, HND and Post HND levels in Engineering, Environmental Studies, Business and related studies, Financial and Related studies as well as Pure and Applied Sciences and Technology. The Board has also developed curricula and model specifications for 43 trades offered in Technical Colleges leading to the award of National technical certificate, NTC, National Business Certificate, NBC, Advance NTC and Advance NBC examinations. These new examinations were introduced in 1993 in place of City Guilds (C & G) of London and Royal Society of Arts (RSA) f London examinations. The examinations are being conducted by the National Business and Technical Examinations Board, BABTEB.

Industry - Polytechnic Relationship In Nigeria And The World

An important feature of polytechnic education in Nigeria is the partnership between the polytechnics and industry in contributing to the education of the student. That partnership is generally

a combination of a thin and thick sandwich. The student is first required to go to industry for a four-month experimental training immediately after the first year of the National Diploma, having attained a certain level of achievement, he is required to have a complete year of experiential training before the student qualifies for admission into the Higher National Diploma. The thin sandwich aspect of the course is supervised and coordinated by institutions, the Industrial Training Fund (ITF) and industrial supervisors. I lowever, the thick sandwich aspect is not supervised by institutions and the ITF, and is generally uncoordinated and characterized by a number of problems.

A critical appraisal of the policy of at least one year relevant industrial experiences before being admitted into the HND shows that neither the polytechnics nor the supervising agency, the NBTE, have clearly defined the objectives or prescribed standards of the on-the-job training schedule for the programme. However, if we adopt the Industrial Training Fund (ITF) established (SIWES) as basis for analysis, we may evolve or stipulate some acceptable and workable objectives for the one year industrial attachment programme, and these would include:

(i) Provide diplomates with the opportunity to acquire relevant industrial skills ad experience in their areas of specialization.

(ii) Provide diplomats with the opportunity to apply knowledge in real productive work situation, thereby bridging the'gap between experimental practical and actual practice.

(iii) Expose diplomates to work methods and techniques of handling equipment and machinery that may not be available in educational institutions.

(iv) Enlist and strengthen employer's involvement in the entire educational process of preparing students for employment in industry.

For holders of the National Diploma (ND) to satisfy the pre-requisites for admission into the Higher National Diploma (HND), they are expected to be absorbed in industry and commerce to obtain the desired cognate experience and exposure that would make them understand the subject matter in its practical form.

If these objectives are anything to go by, there are bound to be serious problems and constrains to the implementation of the laudable objectives of a one year post-ND programme. Some of these problems and constraints are:

- Non Conducive Industrial climate
- Poor Implemented Development Plan
- Lack of Indigenous fylachinery in Nigerian Industries
- **Lack of a Well-Defined Training Schedule.**
- Loss of Popularity of Polytechnic Education

Historical evidence show that polytechnic education was not originally intended to belong to the tertiary tier of education. Rather it was conceived by France, and perfected by the English, and the Russians to be education and training aimed at discouraging elitism and geared towards the practical preparation of its recipients to fulfil prescribed norms of the economy which the traditional academic institutions do not address. The aim was to evolve an educational system based on work and training, (Korol, 1957). It was later reformed in China and this led to its being regarded as university level institution specializing in engineering and technology, and providing in-service training and continuous education (Price, 1970).

In all these evolutionary processes, the focus of providing practical education closed link with industry, commerce, the profession, and the public service in the locality of each institutions. The second focus was to meet the needs of part-time students as an embodiment of a commitment oto widen access to higher education. As we are all witnesses, these two objectives, have never been satisfactorily met by traditional universities.

The polytechnic system as we operate it in Nigeria had its origin in Britain. In preindependent Nigeria, the training of technical personnel was largely a private venture by companies except in some instances for training of forestry, veterinary and agricultural personnel, and such other places like Yaba Higher College and the Nigerian College of Arts, Science and Technology established earlier in 1952 with branches at Ibadan, Zaria and Enugu for specific purposes such as diploma courses in secretaryship, art, surveying, architecture, accountancy administration, estate

management, pharmacy and teachers' certificates. Technical institutes at Enugii and.Kaduna (1958). Ibadan (1960) and Auchi (1964) were later established and upgraded to the Colleges of Technology in the early 1960s. More Colleges of Technology were established in Nigeria during 1970s following the demand for intermediate and higher technician personnel needed for post civil-war reconstruction and rehabilitation work, as well as to respond to the wealth arising form the oil boom. The colleges became streamline the nomenclature f technical institutions. Today, there are some 46 polytechnics in Nigeria.

Nigerian Polytechnic In The New Millennium

Indeed if Nigeria is to derive the full benefit of technical education as conceived and outlined in the National Policy on Education, and in the National Policy on Science and Technology, our strategy must rest on three essential pillars:

1. Creation of awareness, to the development of science culture in the citizenry;
2. Exploitation of Science and technology to transform our abundant resources of nature into goods and services; and
3. Using the wealth so earned to facilitate improvement in the quality of life.

In order for the Polytechnic sub-sector to give leadership to the development and promotion of technical education, the following challenges must be addressed:

(i) Policy framework that will totally integrate technical as part of general education which is accessible and affordable to all. -

(ii) Sourcing and sustaining adequate funding to constantly upgrade facilities and training.

(iii) Forging and re-enforcing partnerships, co-operation and collaboration among all stakeholders, including the international and business communities for the advancement of technical education.

(iv) Deliberate strategies to enhance the prestige and status of technical education through creation of an enabling psycho-pedagogical environment in schools, as well as an enabling socioeconomic environment in the wider society.

(v) Use of advantages offered by the revolution in information technology, economic liberalization, and globalization of trade to provide a unique Nigerian response in these spheres

(vi) The dearth of teachers in numbers and standard.

Conclusion And Recommendations

A critical analysis of the secenerio of this sectarian appraisal calls for the following recommendations which is hoped will enhance uninhabited fulfillment of the objectives for which polytechnics are established in this country.

(i) The funding and quality control of programmes in Nigerian Polytechnics are in the hands of the NBTE just as those of Universities and Colleges of Education are the responsibilities of NUC and NCCE respectively. If Polytechnics, Universities and Colleges of Education are funded directly and it is so recommended, the burden of these agencies will be reduced to a level whereby a single tertiary education regulatory agency can be established to co-ordinate growth and assure quality and standard of programmes. This paper strongly recommends the establishment of a Tertiary Education Commission in the place of NBTE, NCCE and NUC. Many countries are trying only to have Ministry of Higher Education.

(ii) Implementation of the above recommendation will pave the way for Polytechnics which are well equipped and staffed to offer advanced professional programmes and degree courses as well as engage in meaningful research since they will be under the management of a single agency thus making coordination easy.

(iii) Industrial training should be thoroughly supervised and graded and given credit toward graduation so that students can take them more seriously.

(iv) A major function of polytechnic is to design programmes that respond to local needs. That being the case, the wholesale idea of national curricula, which is understandable several years ago, is now anomalous to the advocacy for greater autonomy. Each polytechnic should,

therefore, be allowed to develop and hold themselves responsible to society. In this regard monitoring and accreditation by NBTE should be criterion referenced

(v) It is recommended that polytechnic should establish a scheme to provide their academic staff with industrial work experience. This can be-implemented through extending existing SIWES to accommodate the training a separate Academic Staff Industrial Work Experience Scheme (ASIWES).

(vi) Polytechnic - industry liaison offices should be established to forge polytechnic-industry partnership. Through such a partnership, they may be able to secure industrial work experience for students and academic staff as well as attract the assistance of industry for the accreditation and development of their programmes.

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