

TECHNOLOGY EDUCATION AT THE SECONDARY SCHOOL LEVEL IN NIGERIA POLICY, PROGRAMME AND IMPLEMENTATION.

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ABSTRACT

This paper traces the development of technology education in Nigeria and attempts to highlight the policies and reports that favoured practical and applied skills. This paper presents the value of technology education, the quality of the policy on secondary education and the general objectives of introductory technology and technical subjects at the Junior and Senior Secondary Schools. Problems of the implementation were identified and recommendations made for their solution.

HISTORICAL OVERVIEW

The development of technology education in Nigeria along with other African countries is traceable to the Phelps-Stokes report of 1922. The report recommended clearly defined objectives of education which included the acquisition of agricultural and industrial skills. It called for a survey of needs for industrial training, need for skilled and semi-skilled workmen to construct, maintain and operate commercial and industrial projects such as railways, roads, telegraphs and telephones, motor service, boats, mines and manufacturing establishments (Lewis, 1962). The Commission's report exposed the pitfalls in the colonial governments education in Africa. The revelation forced the British Government to issue the 1925 memorandum on Education policy in British Tropical Africa which encouraged Technical and Vocational training.

In 1944, the government embarked on a 10 year Technical Education Development Plan (TEDP) under the colonial development and welfare Act 1940. This led to the establishment of handicraft and trade centres for training craftsmen while technical institutes were established for technicians. These institutions were established in the Northern, Western and Eastern parts of Nigeria. Industrial training at the formal school level involved practical activities that conformed with the occupational needs of the people. Besides, students were taught basic sciences especially physics and mathematics which were related to their work. Emphasis was on organising quality trade schools that have competent teachers, adequate facilities and time for practical work, and provision of institution in basic sciences.

The Ashby report of 1960 focused on production of needed high level

manpower in order to meet Nigeria's need up to 1980. It also focused on upgrading Nigerian workers who are employed but need further education. In an effort to fully implement the recommendations of the Phelps-Stokes and Ashby Commission, the Federal Government of Nigeria started comprehensive and continuous national development planning in 1960 which quickened the growth of technology education. During the first national development plan period (1962-1968), technical and trade schools were established and facilities for teaching the subjects were provided. Enrolment in Technical and Vocational Schools was about 6,000 in 1962 but the number increased to about 12,000 in 1968. During the secondary the second national development plan period (1970-1974), existing technical and trade schools were expanded and new ones were established. (See Table 1 below). The number of technical and vocational institutions was 29 in 1960 but increased to 159 in 1980-81. The Federal and State Governments had a total allocation of N12.3 million for Technical Education projects. (Federal Republic of Nigeria, 1970). During the third national development plan period (1975-1980), training for specific technical and business occupations were increased and incorporated in educational programmes in Monotechnics, Polytechnics, Universities and industries to meet the needed human resources. Besides, State governments set up similar institutions that will provide enterprising and self reliant graduates in various disciplines. The fourth national development plan period (1981-1985) dealt with the implementation of the provisions of the National policy on education.

In spite of all these efforts, education for the youths in the secondary schools was basically academics, because of the British oriented grammar school system that has been in operation in Nigeria before 1982. The National Curriculum Conference of 1969 observed that the emphasis in secondary education needed to be shifted from mere liberal education and incorporate the utilitarian system of education. To fulfil this, the national policy on education, which was put into operation in September 1982 restructured secondary school system to handle training in manual skills by the introduction of pre-vocational and vocational subjects. The purpose was to give our children in secondary schools different subject options upon which they could build their career in future (Ugoh, 1983). Besides, the introduction of Technology and Vocational subjects in Secondary Schools will remedy the discrepancies between output and needs of the labour market. Onabamiro (1984) remarked that the establishment of Junior Secondary Schools all over the establishment of Junior Secondary Schools all over the federal makes it possible for all future Nigerian Doctors, Accountants, Lawyers, Professors, Architects and top Civil Servant to have gone to the same type of secondary school, learnt some manual skills and be literate in the field of technology. Acquisition of vocational skills is a way of empowering the youths to have saleable skills and sustain themselves when there is no paid employment.

The purpose of this paper is to address the technology education at the

Secondary School level in terms of the policy, programme and implementation. In this context, technology education is defined as training of people in basic technology.

TABLE 1:
 NO. of Educational Institutions in Nigeria by Level and Type 1960-1981

Level/Type of Institution	1960	1965	1970	1975	1980
A. Primary	15,703	4,967	14,902	20,904	36,683
B. Secondary					
2 Gram/Comm. Schls.	883	1,382	1,155	1,519	4,495
3. Fed. Govt.. Colleges	2	2	4	25	40
4. Teacher Training Coll.	315	209	160	253	309
5. Techn./Vocational Schls	29	63	66	76	159
Sub - Tota	1229	1656	1385	1873	5003
C. Tertiary					
1. Coll. of educ./ATC	6	8	15	42	
2. Polytechnics	4	5	6	10	24
3. Universities	3(a)	5	6	13	17
Sub - Total	7	16	20	38	83
Grand Total	16,939	16639	16,307	22,815	41,769

(a) Including Nigerian Colleges of Arts, Science & Tech.(3 campuses)
 Source: Federal Ministry of Education (1986) Statistics of Education in Nigeria 1960 to 1980/81.

THE VALUE OF TECHNOLOGY EDUCATION

Technology education is important for economic independence. Unemployment is common in Nigeria among graduates who read purely academic, non professional or vocational disciplines, while people with vocational skills are in high demand. Unfortunately, career choices among the youth are based on the social status of an occupation and to a lesser degree on employment opportunities and economic benefits. Paleocrassas (1987) identified similar problem in individual demand for education in Greece.

In order to improve the present situation, Nigeria is giving attention to the development of skills in certain basic fields like Food Technology, clothes, manufacturing and service areas which are needed by the economy. The needs in these areas are not met because of shortage in skilled human resource and dependence on foreign raw materials needed in certain industries.

NATIONAL POLICY ON SECONDARY EDUCATION

Secondary education is the education children receive after primary education. The existing policy for secondary education is to make it serve as

- (1) Preparation for useful living within the society; and

- (2) Preparation for higher education. In specific terms, the Secondary School should:-
- (a) provide an increasing number of primary school pupils with the opportunity for education of a higher quality, irrespective of sex, or social, religious, and ethnic background;
 - (b) diversify its curriculum to cater for the differences in talents, opportunities and roles possessed by or open to students after their secondary school course;
 - (c) equip students to live effectively in our modern age of science and technology;
 - (d) develop and project Nigerian culture, art and language as well as the world's cultural heritage;
 - (e) raise a generation of people who can think for themselves, respect the views and feelings of others, respect the dignity of labour, and appreciate those values specified under our broad national aims, and live as good citizen;
 - (f) foster unity in Nigeria with an emphasis on the common ties that unite us in our diversity;
 - (g) inspires its students with a desire for achievement and self-improvement both at school and in later life
- (Federal Ministry of Education, 1981).

This policy has two significant features that will be used to achieve the goals and objectives. First, there is a change in the educational structure. The existing structure consists of six years of primary, three years of Junior Secondary, three years of Senior Secondary and four years of University education (6-3-3-4). This structure replaced the former 6-5-2-3 structure which is made up of six years of primary, five years of Secondary, two years of sixth form Higher School and three years of University education. Secondly, the programmes at the Secondary School comprise of academic and pre-vocational subjects.

The Nigerian secondary education concept is an attempt to combine liberal arts, science and technology into one comprehensive type of school. The secondary education is in two levels - Junior and Senior. This two-tier system was put into operation as a result of government's concern for qualitative education in Nigeria. The implication of the system is that after three years of Junior Secondary education, and given appropriate test and counselling, the student will be able to choose a future career which is consistent with his/her interest and aptitudes.

TECHNOLOGY EDUCATION PROGRAMME

The system of education is biased towards science and technology with a focus on the creation of science and technology awareness at the Primary school level, orientation and exploration of technology at the junior secondary and

preparation in technology at the senior secondary school level. The technology education programme is based on activity oriented instruction. This enables students to reinforce abstract concepts with concrete experiences. It also emphasizes on "know-how" and "ability to do" in carrying out technological work.

Technical subjects are available at the Junior and Senior secondary school levels. There is the Introductory Technology at the Junior level while courses in Applied Electricity, Electronics, Building Construction, Woodwork, Auto-mechanics, Metal work and Technical drawing are in the Senior secondary school curriculum. The Junior and Senior secondary schools (SSS) curricula are uniform to all schools and colleges in the federation.

THE IMPLEMENTATION OF TECHNOLOGY EDUCATION AT THE SECONDARY SCHOOL

Implementation is a definite plan or procedure employed to achieve the aims and objectives of the policy. The programmes for the Junior Secondary was formally launched in 1982 and took off in 10 States and the Federal Government Colleges. The states are Anambra, Bauchi, Borno, Cross River, Gongola, Kaduna, Kano, Niger, Plateau, and Sokoto. Political factors hindered uniform implementation in all states of the federation. It is important to note that by 1982, Nigeria already had civilian government and some states preferred to implement party programmes rather than the 6-3-34 system of education. In 1985, all the States in the Federal Republic of Nigeria have started the JSS classes. By 1990, all the States have fully implemented the JSS and SSS programme. The terminal examinations at the JSS and SSS are Junior School Certificate Examination (JSCE) and Senior School Certificate Examination (SSCE) respectively.

Efforts made towards successful implementation include:

1. Purchase and distribution of pre-vocational equipment to schools. A total of seven thousand, two hundred and fifty four (7254) units of the pre-vocational equipment were supplied to schools. (One unit represents a complete set of equipment needed to teach Introductory Technology in each school).
2. Training of technical teachers to handle the pre-vocational components and other technical subjects in the educational system. Federal Government awarded scholarship under the Technical Teachers Training Programme (TTTP) which started in 1981. Recipients of the award were trained abroad but the programme has been mounted in Universities and Polytechnics within the country.
3. Building of workshops and installation of equipment in some schools. The community and the government were involved in this exercise.
4. Organisation of workshops and seminars to expose technical teachers and trainers to effective use of tools and equipment for individual and group

practical training. In addition, particular attention was given to the organisation and management of multi-purpose workshop and technical teaching methods. Also, the Federal Ministry of Education organized enlightenment seminars on the 6-3-3-4 system of education.

PROBLEM OF IMPLEMENTATION

There are major problems facing the implementation of pre-vocational and vocational programme at the Secondary schools for the past ten years which are likely to continue.

Allocated resources were usually inadequate to put the programme on a strong footing. The laboratories are ill-equipped, marginal teaching equipment and supplies, as well as crowded laboratories. There is increase in student population without a corresponding increase in source of revenue or funding. There is shortfall in government funding of the schools and there is the fear that this could affect the quality of the graduates of the programme.

The implementation of the policy commenced without qualified specialist teachers for the smooth take-off and running of the programme. Although efforts have been made to train teachers of technology, they are not enough and this category of teachers are still absent in many schools.

There is lack of physical facilities like workshops, laboratories, equipment and tools in some schools. This makes it difficult to have practical work in workshop oriented courses. Schools located in rural areas having pre-vocational equipment cannot operate them because there is no electricity supply in the environment and no generating plant to power the machines like circular saw, planar, lathe, power drill and grinding machine. In some states, the equipment were locked up without making efforts to use them. Besides, many pre-vocational tools and equipment have been stolen in some States.

CONCLUSION

This paper examines technology education at the Secondary School level in Nigeria in terms of the policy, programme and implementation. The national policy on secondary education is laudable and beautiful in terms of purpose. The aim is to serve as a preparation for useful living within the society and for higher education. The pre-vocational and vocational components at the Secondary School are to provide students with foundation and skills necessary for technological growth. This is clearly shown in the national curriculum for Junior and Senior Secondary Schools. However, the current situation in most secondary schools leaves much to be desired. It is either we do it well or be left behind in the global trend to train all persons in basic technology because of its vital role in national development.

Is Nigeria in a position to maintain the current system of education? This question is pertinent because it is easy to draw up a policy but the implemen-

tation is often difficult. Past experience has shown that we often lack the preparatory process and resources both human and material to maintain an innovation. Often, we are left with crash programme which is not good enough and can cause the project to fail. The success of any system of education is hinged on proper planning, efficient administration and adequate financing. Poor planning and execution of educational services can adversely affect the quality of training output. The quality and competitiveness of Nigerian Secondary education product is threatened by lack of resources inadequate facilities, shortfall in funding and shortage of adequately qualified teachers of technology.

There is the need therefore, to review the policy, programme and implementation strategies of secondary education so as to adapt to changing circumstances. Failure to do this may render the policy useless as a blue-print to guide the nation to achieve technology literacy, raise the standard of living and learn respect among the world community.

RECOMMENDATIONS

Based on this study, the following recommendations are made:-

1. The Federal Government should review the policy, increase the funding for education and re-examine the strategies for achieving the goals and objectives of secondary education.
2. State Ministries of Education should inspect the facilities for pre-vocational subjects and get the principals of schools to provide regular inventories of the tools and equipment.
3. The Local Government should owe it as part of their responsibility and obligation to see to the growth and development of the institutions located in their area.
4. The Federal and State Ministries of education need to mount in-service courses, seminars and workshops regularly for teachers of technology. The purpose is to make them catch up with the deficiencies that may exist between their levels of professional and technical expertise, and the demands of the national curriculum for Junior and Senior Secondary Schools.
5. The undergraduates curricula for teachers of technology should be reviewed to put more emphasis on technical content. Prospective teachers need to learn their subject matter deeply enough to teach it well.
6. Rewards for teachers of technology should be improved. Nigerian students' performance will not improve much if the quality of teaching is not improved. Also, teaching will not improve if the training and rewards for teachers, and working conditions in schools are not improved.

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INTRODUCTION

The drive to propose a qualitative practical content for the Automobile Technology taught in Colleges of Education level was informed by the remarks often made by the media, employers of labour, evaluators of education programmes and the society at large that graduates of Colleges of Education (technical) are "rip offs", incompetent and are of generally poor performance. This perceived inadequate performance can be linked to many causal factors, some can be controlled, some cannot. Among the items amenable to control and improvement are the practical contents designed to train students for the automobile service industry which can also equip them enough to manage successfully the Automobile technology education programme both at the first and second tiers of the Nigerian Education System.

As will be recalled, traditionally, Automobile technology trainees in Nigeria obtained their training through formal and informal education which involved on-the-job-training. The on-the-job-training was not always accorded a due recognition like the trainings received in schools, colleges and Universities. This attitude was a replica of the British who do not regard the knowledge obtained in the industry as

education. Thus the machine institute established in England then was meant only for the practical application of the science and technology. People generally progressed from "spare tree mechanics" to an employee of some segment of the automobile service industry, e.g. service station, independent garage or automobile dealership. Immediately after the World War II, there were moves towards formal