SCHOOL-BASED APPROACHES TO SKILL IDENTIFICATION MODELS IN INTRODUCTORY TECHNOLOGY UNDER THE UNIVERSAL BASIC EDUCATION (UBE) SYSTEM IN NIGERIA

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ABSTRACT

The achievement of self-reliance by any nation depends to some extent on the availability of trained skilled labour force which is a means of making people to be good workers so as to be better performers in their own interest and that of the larger society. Introductory technology under the universal basic education (UBE) was structured to assist learners to develop interest in technology. The aim is that at the end of junior secondary school, technological ignorance will be reduced and solid foundation laid for students' entrance into a vocation of their choice. It was then expected that through effective teaching and learning of the course the pupils would acquire technological skills, and Nigeria by now would have been self-reliant like most other developed nations. Today, it is very obvious that the contrary seems to be the case. In order to further strengthen the teaching and learning of the subject, this paper analysis the present teaching pattern with the prevailing structure and suggested approaches to skill identification in school-based career that should be adopted and integrated with the UBE system of education, as a way of creating academic and vocational awareness in Nigeria youths and making the programme much more meaningful not only to the learners but to the citizenry at large.
Keywords: Educational approaches, skill identification, UBE programme

INTRODUCTION

The universal basic education programme is an ambitious educational programme, which was launched and executed by the government and people of Nigeria to eradicate illiteracy, ignorance and poverty as well as stimulate and accelerate national development, political consciousness and national integration. President Olusegun Obasanjo flagged off UBE programme on 30th September 1999 in the historic city of Sokoto in Sokoto State. The UBE programme is aimed at equipping individuals with such knowledge, skills and attitudes that will enable them:

1) Live meaningful and fulfilled lives
2) Contribute to the development of the society
3) Derive maximum, social, economic and cultural benefits from the society
4) Discharge their civic obligations competently

The goals and objectives of universal basic education programmes are to universalise access to basic education, engender an environment conducive

for teaching and to eradicate illiteracy in Nigeria within the shortest possible time. The specific objectives of the programme are to:

a) Develop in the entire citizenry a strong consciousness for education and a strong commitment to its vigorous promotion.

b) Provide free, and compulsory, education for every Nigerian child of school age.

c) Reduce drastically, dropout rate from the formal school system through improved relevance and efficiency.

d) Cater for dropout and out-of school children adolescents through various forms of complementary approaches to the provision and promotion of basic education.

e) Ensure the acquisition of appropriate level of literacy, numeracy, manipulative and life skills as well as the ethical, moral and civic values needed for laying the foundation for life-long learning.

With the above laudable objectives one can observe that there will be increase in the number of pupils in both primary and junior secondary schools. Also more introductory technology workshop facilities will be required to cope with the increasing number of scholars.

Introductory technology is one of the compulsory prevocational subjects at junior secondary school level. Being a pre-vocational subject offered in the UBE programme, it provides a solid foundation for the acquisition of scientific and technological skills for gainful employment, self-reliance, sustained and purposeful development. In order to prepare youths for employment and self-reliance after the UBE programme at the junior secondary level, efforts must be made to help them acquire the necessary basic knowledge and skills in woodwork, metal work, electrical works, building practice, auto mechanics and resource management.

PURPOSE OF INTRODUCTORY TECHNOLOGY IN THE UBE PROGRAMME

Introductory technology is a pre-vocational subject offered at junior section of post primary education (NPE 1998, ed.). The main purposes of prevocational education and hence that of introductory technology include: Requisition of basic technical skills, exposing students to career awareness by exploring usable options in the world of work, and enabling youths to have an intelligent understanding of the increasing complexity of technology, (NPE 1998). Closely related to the above objectives, Ivowi (1995) states the objectives of introductory technology as follows:

a) To provide student with technological literacy required for everyday living.

b) To provide pre-vocational orientation for future development of employable skills and training in technology

c) To stimulate creativity.

On a more specific term, Vandeakaa (1988) observes that the features of introductory technology include:

a)   The development of a broad range of skills rather than in-depth study in a specialization area,

b)   Introductory technology is essentially practical; hence the teaching of the subject demands workshops, tools and equipment.

c)   Theory is kept to the minimum and concentrated primarily on topics related to the practical work

d)   Introductory technology is taught using an integrated approach that is the various components of technology are not taught as individual subjects (as was the case in the past) but as an integrated subject

e)   Whereas introductory technology provides technological literacy for everyday living, skills to be developed are made relevant to students' environment.

These objectives are fully backed by UNESCO, as at 1972, UNESCO organised worldwide conference on this topic of introducing prevocational education to students at early stage. The following objectives were given:

-   Adjustment of educational to industrial and social needs
-   Change of attitude
-   Preparation for modern life
-   Improvement of learning process
-   Creativity and imaginative approach
-   Pre-requisites for further vocation and technical education
-   Observation and orientation

Putting all these objectives from different experts into consideration, one would agree that introductory technology programme provides a broad based skills development approach to practice-oriented work where practical application of day-to-day needs in the service of man is emphasized. As a way of translating these objectives into reality and concrete operational terms, some models of career education were formulated.

CURRICULUM OF INTRODUCTORY TECHNOLOGY IN NIGERIA

The idea that technology is a key to the industrialization, development and self-reliance of any nation informed the Federal Government of Nigeria to embark on a major and most challenging innovation in the education industry in accordance with what was obtainable in other advanced and developing countries. This gave 'birth' to introductory technology programmes at junior secondary school level, (NPE, 2004). The Federal Government might have realized this importance of introductory technology in the industrial development of the nation when it was introduced into the school system and made compulsory at junior secondary school level. In this way many developing counties have realized the importance of introductory technology alongside with Nigeria and have tried to reorganize their educational system to benefit

from the diffusion of the technical knowledge and the advantages from sponsoring aids and overseas training centres.

Today technology is an inescapable part of life, (Olorunselu 1990) observes that for the future generation this will be increasingly true as most of their activities will be controlled by a more advanced technology in their time. It is therefore, necessary to bring them in line with the realities of the present day technological trends with the hope that they will develop with it into the future. With this observation, it is very important to have a good beginning in any of the vocational subjects otherwise frustration may set in late when it will be necessary to pack it up. This suggestion is hinged on the premises that what good beginning and plenty of practice offered within their employment in the workshop, the achievement of introductory technology will be assured. From the genesis of introductory technology through the objectives up to experts' comments, it is clear and obvious that the wisdom of introducing introductory technology into the school curriculum in Nigeria is not in doubt.

It is in line with what other countries of the world are doing in order to stimulate interest in the youngsters in technology, which is the surest way to national industrialization and development. This can however, be done only when the programme is successfully implemented.

THE TEACHING OF INTRODUCTORY TECHNOLOGY IN SCHOOLS

According to this new policy, Nigeria Education system will be on the 6-3-3-4 plan, that is six years primary education followed by a three year junior and a three year senior secondary education, culminating in a four-year University programme. Olawepo (1999) observes that it is worth mentioning that the junior secondary school will be both pre-vocational and academic, and will teach all basic subject, which will enable pupils to acquire further knowledge and develop manipulative skills. The sole aim here in the words of Fafunwa (1984) is to develop in our children aptitude for things that are technical and not necessarily making technicians out of them. The desire of well wishers is to see these children develop to manipulative skills, self-reliance, respect for dignity of labour; among others. At the end of the junior secondary school, students who are academically inclined can go straight to senior secondary school while those who are technically inclined can go to technical colleges and other vocational/technical institution, those who will complete the senior secondary school could move to either polytechnics, colleges of Education or university.

The entire educational enterprise as a system is designed to achieve some specific objectives often derived from the national objectives. In teaching, these objectives are summarily described as the desired behavioral changes of the learners. The educational process is usually planned to achieve positive changes or a modification in behaviour, which may result from encounter or series of encounter with some experiences (Obanya, 1985). Akinyemi (1999) observes that for teaching to be successful, it must be deliberate, this is

methodical, planning, resourceful, activity based, related to the learners experiences and life. The communication process must follow a logical sequence and competence based. The teacher, as the prime mover of the process must have sound knowledge of the subject matter.

However, recent result from research and development activities in education have placed greater emphasis on learning techniques of new instructional methods and needs for constant review of the traditional approaches and instructional delivery method. There is no other area of education where individuality of the leaner is more recognized than in introductory technology. Teaching introductory technology is both teacher and learner focused. The teacher is expected to be dynamic, resourceful and conscious of the rapid developments in the field of technology and constantly bring these to bear in his interactions with the learners. As noted by Akinyemi (1999), the bulk of knowledge and skill that technical teachers in Nigeria are called upon to impart and motivate students to learn and apply are foreign to their traditional environment. The body of knowledge constantly changes with the developments in introductory technology and societal needs

On the learner side, the magnitude of the theoretical and practical information required by them to attain the expected level of competence is so high, complex and extremely new. The learner is expected to learn at his own pace, conscious of new information and environment, though unconsciously, should be able to compete with his peer to earn a desirable place. Introductory technology has characteristics of new body of knowledge and features of complex traditional discipline therefore require special treatment for successful teaching and learning. Introductory technology is one of the new subjects brought into the Nigeria education system by the National policy of education (1981). It was introduced to satisfy the need to make the educational process and enterprise relevant to the individual and societal needs. Initial effort at the development of similar body of knowledge emanated from the need to enhance the ability of the student to conceptualize geometric solids and understand some basic tools and processes. It has equally been observed that understanding the subject has transfer effects on such subjects as Physics, Chemistry, Biology, Business Studies and even Accounts (Lux, 1970).

However, the rapid development of technology and its attendant effects on individual and the national development have expended the frontier of the concept of introductory technology. Introductory technology as a subject, therefore, can simply be described as simplified familiarization to the fundamentals of technology. It has been fundamental to technology and technology education in Nigeria, that is, means of creating technology literacy and awareness. According to Ivowi (1995), introductory technology is presented as distinct but related components of technology. Emphasis is on exposition to both theory and workshop practices with a view to acquiring knowledge and skills to a qualified degree of attainment.

Introductory technology is apparently and even actually more of workshop subject. In most cases some of the theoretical concepts are better taught in the workshop for effective illustration (Ivowi, 1995). In addition, introductory technology will help to develop in our pupils' aptitude for things technical and ability to manipulate some basic tools. It will help to develop curiosity and creativity in pupils and in fact serve as basis for manpower development in Nigeria. It is also expected that if introductory technology is well implemented in our schools it will help to create a new technological culture, a new scientific outlook which will allow young Nigerians to participate actively in the making of history rather than just submit themselves to it.

STUDENT'S PERFORMANCE IN INTRODUCTORY TECHNOLOGY

Some of the problems that could be responsible for Students performance in introductory technology in secondary schools include vocational interest, available equipment/facilities, instructional materials and qualified introductory technology teachers. The prospects of introductory technology in vocational education has been identified in relation to students performances, the expected pre-vocational orientation cannot be provided except with good performance, through introductory technology with the use of equipment at junior secondary school. This enhances improved performance on vocational subjects selected at senior secondary school level or equips youths with new opportunities responsibilities and challenges in the world of work upon graduation.

This is why Ugwu (1987) observed that the future of any nation lies on the skills, knowledge and abilities of her children. Most of the high school leavers roam the streets without jobs and this is attributable to their lack of the required skills for the world of work (Ezeji, 1985). If the introductory technology curriculum must achieve its objectives, its teaching and learning must involve both theory and practice. If the evaluation of learning outcome must be reliable and valid, it must evaluate the three domains;- the cognitive, effective and psychomotor domains. One major role of vocational/technical programme is to prepare individuals for the world of work, through such programmes the individuals acquire some relevant knowledge and skills in specific occupation areas which will enable them fit into jobs in industries, businesses and also self employment. Ezugu (1990) observes that for the programme to be effective, the training tool and equipment must be at least similar to those being used in industries and businesses for those jobs.

There is need to consider the introduction of practical tests in introductory technology in the junior secondary school Certificate Examination for the objectives of the programme to be realized. Practical examination should form part of the JSCE in the programme. This agrees with the recommendation of Etuk (1989) on the way of making the implementation of the programme effective in Cross River and Akwa Ibom State. Akpa (2001) remarked that inadequate availability of equipment for the teaching of introductory technology

has been having serious effects on the student's performance in introductory technology. Since the UBE system of education employs the continuous assessment (CA) as an evaluation model, students could be made to produce a total of 10 specimen pieces of practical work during the nine terms of three years that the programme lasts. This will mean producing one specimen piece every term and one during the final examination. This system will not only motivate the student to take their practical lessons seriously but will improve the acquisition of the necessary skills. This will also make the continuous assessment (CA) scores of individual students more reliable, because both the psychomotor and cognitive domains are being tested.

Renewed emphasis on practical exercise and test at the junior secondary school level will provide a transition from the vocational orientation to vocational acquisition. If students do not begin to learn theory and practices at the JSS level, most vocational subjects at the SSS level will still remain strange to them. Ugonabo (1990) agrees that student's perception of introductory technology will broaden if enough practical and projects that will result in useful produces are conducted. This will ensure that the correct type of manpower is being developed for the greater need of the private and public sector of the Nigeria economy.

APPROACHES TO SKILL IDENTIFICATION

The aim of introductory technology programme is the acquisition of skills involving knowledge, judgement, accuracy, and usually manual dexterity, all of which are acquired as a result of long training and practice. The ability to perform well arises from repetitive performance. There are several approaches used in the identification of skills in introductory technology. These approaches include: Competency-based approach, job analysis approach, task analysis approach, occupational area approach, and modular approach.

Competency-based approach: To be competent, means that the individual has acquired skills, knowledge and attitude which require performing successfully at a specified proficiency level in any given work. Competency therefore is the knowledge, skills, attitudes and judgment needed to perform these tasks. Judgement involves the use of cognitive and effective skill in the process of making decision. A competent introductory technology teacher is one who possesses the knowledge and skills needed to perform introductory technology activities. In identifying skills in introductory technology through competency based approach. The following steps should be followed:

i). Identify all task or operations to be learnt
ii). Arrange task in appropriate courses
iii). Organize knowledge and work skills for each task to be learnt to hierarchy of difficulty
iv). State what should be done in order to master each skill or knowledge
v). Job analysis approach: Job analysis approach is concerned with identifying training content of works. Allen (1995) explained job

analysis as the scientific study and statement of all facts concerning a job which reveals its content and other factors around it which involves;

(i). Identifying the criteria needed to achieve success on the job; and

(ii). Identifying the traits that will predict the criteria for success

Task analysis approach: Task analysis approach is concerned with breaking works into smaller components. The first step entails listing all the steps involved in each task in terms of what the actual learner does when performing the task and secondly, stating the actual operation of the task. The task analysis approach is therefore relevant to introductory technology production. The following steps are relevant to developing a task:

(i). Breaking an occupation into various tasks for example, in woodwork, cutting wood, making joints and assembling the joints are tasks.

(ii). Breaking the task into specific learning activities like measuring and setting out.

(iii). Validate the activities through a review of job functions to materials and methods for performing.

(iv). Identify the material and methods for performing each activity like wooden rules, saws, and type of wood.

(v). Implement the activities

Occupational area approach: In some technical competencies, occupational areas overlap. In affirming this observation, Thompson (1997) observed that technical competencies of one occupation like furniture making may be relevant to the technical competency required by another occupation like roofing. For instance, furniture making may require competent personnel in planning, co-coordinating and evaluating. The implication of this overlap is in technical competencies is that learning and coordinating from one occupation can offer their services in another occupation and vice versa. This has serious implication in training and re-training of employees including introductory technology teachers especially during job transfer. Baker (1996) noted that this approach identifies competencies which are common and to some extent necessary for initial employment in a number of related jobs and or occupations. He further maintained that this approach may be great use in curriculum so that such occupation will involve levies of technical knowledge for efficient performance of the skills, ability, attitude and understanding of the profession. The approach is therefore relevant in introductory technology training.

Modular approach: Modular approach is an effective method of teaching skill oriented programmes. Modular approach to training is relevant to introductory technology, which is a skill related occupation. It involves dividing training courses workshop activities into units referred to as modules. In this arrangement, appropriate work skills in introductory technology are identified, arranged sequentially, and then used for training purpose. The modular approach is flexible enough to accommodate a variety of teaching and learning environment and occupational goals of the trainee forms the basis for programme planning.

CONCLUDING REMARK

Adapting and integrating the school-based approaches to skill identification model into the system will ensure a solid educational foundation; and at the same time ensuring the maximum utilization of human resources available and meeting the manpower needed in the various fields of work. On the whole, this paper has exposed the consequences of teaching introductory technology subject without functional and proper manpower and materials, these consequences include producing students without proper workshop skill orientation that can lead them to senior level in related trades without problems; producing students that will easily be employed into labour market with basic needed prerequisite in practical in various trades of the introductory technology subject; as well as producing students who will be self employed based on the skill orientation experiences they have had in the school under the programme of introductory technology.

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