

Improving the Curriculum Content of Electrical/Electronics Technology Education in Colleges of Education in Nigeria for Better Job Creation

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Abstract

This paper was designed to look at the impact of the curriculum of Electrical/Electronics Technology Education in Colleges of Education for better job creation for its graduates. Themes treated include Goals of Technical and Vocational Education in Nigeria, Functional Vocational and Technical Curriculum Implementation, Nature of curriculum for dynamic society and an overview of the Electrical Installation Content of the Electrical/Electronics Technology Education Curriculum in Colleges of Education in Nigeria. The researcher observed that Electrical installation work have not been accorded its due position in the curriculum thereby limiting the opportunities for its graduates in achieving self-reliance after school. Recommendations were made to further improve on the curriculum of Electrical/Electronics Technology Education programme. Some of the recommendations are: Curriculum planners should as a matter of urgency single out a course that will take care of all Electrical installation related problems and Government should ensure that only technically qualified and registered professional Electrical teachers with the requisite on-the-job experience are recruited to improve Electrical teaching.

Keywords: Curriculum, Technology, Electrical and Electronics, Job Creation, Nigeria, Colleges of Education

Introduction

Education is a dynamic instrument of change in Technical Education skill acquisition; hence governments all over the world invest massively in the education of their citizenry in technical skills required for the modern age. The students must be exposed to the curricular content of technical education that will lead to the production of people who can bring about socio-economic developments of their nations (Umunyadi, 2013). For Technical Education curriculum content to be meaningful, the educational system must have effective and competent teachers who are resourceful and well-motivated to carry out the job effectively (Oboro and Onosode, 1999). Vocational Education is education for work as it prepares individuals to be gainfully employed. Akaninwor (2004) defines Vocational Education as a

type of education or training designed for preparing the individual/learner to earn a living (to be self-reliant). Osuala (2004) opines that any education which is necessary for effective employment in an occupation is vocational. He further explained that Vocational Education assumes that a choice of occupation has been made and that appropriate training is needed to enable an individual enter or advance in his chosen occupation.

Electrical/Electronics Technology Education is a part of Vocational/Technical Education and its relevance towards job creation in Nigeria cannot be over-emphasized. It is on this note that we need to look in-depth into the curriculum content of Electrical/Electronics Technology Education in Colleges of Education Technical to ascertain the level of practical content it possesses that will prepare the students for the field of work in electrical installation upon graduation.

The Goals of Vocational and Technical Education and Training (TVET)

The National Policy on Education (2013) conceptualized technical and vocational education as a comprehensive term referring to those aspects of the educational process that involves, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. This is equivalent to the senior secondary education but designed to prepare individuals to acquire practical skills, basic scientific knowledge and attitude required as craftsmen and technicians at sub-professional level." The Policy also enumerated the goals of Vocational and Technical Education and training in Nigeria as follows:-

- a. Provide trained manpower in the applied sciences, technology and business particularly at craft, advanced craft and technical level.
- b. Provide the technical knowledge and vocational skills necessary for agricultural, commerce and economic development.
- c. Give training and impart the necessary skills to individual who shall be self-reliant economically.

Functional Vocational and Technical Curriculum Implementation

Nwachukwu (2001) stated that certain factors are crucial for functional vocational and Technical Education curriculum implementation. The factors are enumerated and explained as follows:

- a. The vocational and Technical Education curriculum must be humanized. The curriculum for Vocational and Technical Education in Nigeria should not be something foreign to technical college students, and should not be chosen just because it is traditional. The Vocational and Technical Education curriculum must speak of today,

of real-life problems facing our communities and society and the process of living in its entire ramification. Nwachukwu explained that humanizing today's Vocational and Technical Education means making the curriculum responsive to the present situation of Nigeria. Humanizing Vocational and Technical Education means training the youths for sustainable and self-reliant empowerment in Nigeria. Materials chosen in this vocational and technical education curriculum to be taught and utilized for learning should be derived from the need and environmental requirement of Nigeria for sustainable youth empowerment in the nation.

- b. Trainees must be ready to receive what is taught. The ability of the trainees to learn depends on that student's readiness to learn. In any teaching-learning situation, there is a period when effective learning takes place. This learning period varies among individuals even when they are exposed to the same learning environment. Many factors are known to influence the readiness to learn among students. The factors include age, family background, nutritional status, fatigue or lack of it. Others are belief and attitudes of learners. It therefore means that the art of good teaching lies in the ability of the teacher to find out those learning related problems, which students exhibit during classroom and workshop instruction, and utilizing the knowledge about it to structure the curriculum of Vocational and Technical Education in Nigeria.
- c. The learning experiences must provide the development of the ability to think. In Vocational and Technical Education, thinking is the process of realizing and finding solutions to problems. It has been defined as all those cognitive actions taken by an individual in advance of an action as a preliminary to deciding among alternative thinking. According to Nwachukwu (2001), it characterized the whole process of solving a problem, which is very essential for handling problem-solving situation or for carrying out tasks in Vocational and Technical Education situations.
- d. The Vocational and Technical Education curriculum must be based on and contain experiences intrinsic to the life of the learner. There are stages in Vocational and Technical Education when students pass through the pre-vocational to the vocational concepts and characteristics, they develop new ideas, shape their values and can by so doing, solve their individual problems. These students can constantly undergo the process of exploring and testing out ways of getting to where they want to go. In this manner, these students will

learn, and this learning process requires direct thinking. These students can in this process discover new materials relevant to the solution of their problems. Such materials must be intrinsic to them because they discovered the materials themselves and found it useful for solving their immediate problems. These intrinsic materials will remain internalized in the students because they have fixed the knowledge into the repertoire of their abilities and understanding.

Nature of Curriculum for Dynamic Society

What kind of curriculum will be suitable for training the teachers of technology for the future? Knowledge is always changing and so the content to be taught in the future schools may as well not yet be known. What is important therefore is that the curriculum for the education of the teacher of the future will be based on the principles of dynamism and adaptability. Technical Education curriculum will be sensitive to the prevailing societal needs to be achieved through education.

Technical Education curriculum should be able to equip the teacher to be able to perform within the tenets of the contemporary situation. The Technical Education curriculum should reflect societal goals, interests and value expectations that are changing fast. Those disciplines that are phasing out and some that are emerging should be given consideration, and delete those aspects that are not needed.

New knowledge is emerging, rendering some obsolete. New technologies are emerging with great impact on the learner, the technical education teachers, the society and the entire education enterprise. Skill and knowledge are inseparable entities, there are no elements of differentiation between them. It should be noted that all skills are form of knowledge but not all knowledge are forms of skills, however, all skills are dependent on some form of knowledge. Skill is a manifestation of acquired knowledge. It is a knowledge that is translated into practical activity. It may also be described as knowledge that is put into practical use once it is translated into activity (Okorie, 2000).

All these emerging complicated constraints of the learners of Technical Education courses pose more demands on the future teacher. The Technical Education curriculum will have to equip him to cope in content and pedagogy.

Education is a dynamic process and for it to continue with the changing needs of the changing society, the Curriculum of Technical Education will undergo innovation and change. Technical Education curriculum innovation and change pose new demands on the teacher and the whole process of Technical Education teachers. To this end, Technical

Education curriculum for the future will have to address some pertinent issues in the National Policy on Education (2015).

An Overview of the Electrical Installation Content of the Electrical/Electronics Technology Education Curriculum

Electrical Installation work is one field of Electrical/Electronics Technology Education that offers immediate self-employment to its graduates upon graduation. Electrical installation work involves the art of wiring residential and industrial buildings with the latest wiring techniques and reference to IEE regulation. This can be in the form of PVC conduit installation, steel conduit installation, trunking system of wiring and cable tray system of wiring. This field of Electrical/Electronics Technology Education requires little or no financing to start up upon graduation due to these reasons:

- Few tools such as hammer, chisel, screw drivers, pliers, tape measure and saw are needed to undertake a complete installation work.
- Office space is not necessarily needed to start up.

It is disheartening to note that the current curriculum in use for Electrical/Electronics Technology Education did not consider Electrical installation work as a course on its own, despite its relevance in job creation upon graduation. Instead, instead only some aspects of Electrical Installation reflected in two of the courses studied in Electrical/Electronics Technology Education in Colleges of Education Technical in Nigeria. The table below shows the list of these two courses and their content/outlines.

Table 1: List of Courses and their Content

S/N	Course Code	Course Title	Credit Unit	Course Content
1	TED 113	Introduction to Electrical/Electronics	2	- Sources of Electricity - Electrical component and tools - Simple Electrical wiring - Electrical safety and basic tools - Structure of matter - E.M.F and Potential Difference - Electrolysis - Resistors, capacitors - Ohm's Law - Electrical power and energy - Simple domestic Electrical installation - The IEE wiring regulations applicable to simple installation

				and power distribution m. Electrostatics and Electronics devices n. Career in Electrical/Electronics industry
2	TED 321	Electrical Machines and Power	1	a. Power generation, transmission and distribution, transmission lines, Tariffs, power factor and correction b. Sub-station installment and maintenance c. Protection Devices d. Power supply and stabilization system e. Machines (AC and DC) including transformers f. Testing g. Wiring systems (Industrial) h. Illumination

Source: NCCE minimum standard for Technical Education (2012 Edition)

From table 1 above, it is seen that “Simple domestic Electrical installation” is a course outline/content under the course TED 113 (Introduction to Electrical/Electronics) and “wiring systems (Industrial) is also a course outline/content in the course TED 321 (Electrical Machines and Power). Another observation of note is that TED 321 (Electrical Machines and Power) is assigned one (1) credit unit thereby limiting the time frame required to teach this course. Also the course with one credit unit will be affected by the evaluation as a result of the number of question that will be used for assessment of the students at the end of the course.

From the above observation, it is seen that the missing link in the Electrical/Electronics Technology Education Curriculum is the need for a stand-alone course that will take care of all aspects of Electrical Installation work both in residential and industrial buildings. There is need for a course dedicated to handle all **Electrical installation related problems** due to the great importance installation work play in the world of work. The course outline/content of this Electrical Installation course should be streamlined to cover such topics as:

- i. Safety in Electrical installation
- ii. IEE regulation
- iii. Electrical installation tools
- iv. Wiring systems

- v. Conduit wiring system
- vi. Final sub-circuits
- vii. Protective devices
- viii. Earthing system
- ix. Rewinding of electric machines
- x. Testing and inspection
- xi. Illumination
- xii. Cables and cable sizing
- xiii. Installation of service connection
- xiv. Wiring accessories

Recommendations

The following recommendations are made as a way of improving the curriculum content of Electrical/Electronics Technology Education towards job creation.

1. Curriculum planners should as a matter of urgency, design out a course that will take care of all Electrical installation practicals. Also Technical teachers in Colleges of Education Technical should be actively involved in the Curriculum planning.
2. Curriculum implementers should make sure that the practical part of the Electrical installation course should be taught at the school workshop or if possible, the students should be taken to building construction site to participate in the Electrical installation work.
3. Also, the Government should ensure that only technically qualified and registered professional Electrical teachers with the requisite on-the-job experience are recruited to improve Electrical teaching.
4. Finally, there should be a regular re-training programme for the teachers of Electrical installation course in order to keep them abreast with the recent changes and best practices in the installation work.

Conclusion

Vocational and Technical Education (VTE) is the most viable and reliable instrument for economy transformation. This is why Vocational and Technical Education is placing emphasis on the development of occupational skills needed as preparation for work in order to earn a useful and lawful living through gainful employment. It also involves the application of the brain and manipulation with the hands in order to give an individual the "best assurance in a creative activity." It is in line with this, that the study is designed to look into the current curriculum content of

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Electrical/Electronics Technology Education and its ability to meet up with the challenges of job creation for its teeming graduates. The author looked at technical education's goals of National Policy on Education (2013). The goals of Vocational and Technical Education in Nigeria will remain unachievable if the challenges posed by the contemporary needs are not met. The nation must therefore look ahead and project evolving strategies for a better planning and implementation of the curriculum that can actualize sustainable empowerment for the graduates of Electrical/Electronics Technology Education in Nigeria.

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