IMPROVING ELECTRONICS LEARNER FRIENDLY INSTRUCTIONAL TECHNIQUES IN VOCATIONAL AND TECHNICAL SCHOOLS.

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Abstract

The society is full of dynamism and today's learners need corresponding change to meet the challenges inherent in these continual changes. The current paradigm for learning, that is "learning how to learn" warrants a shift from teacher centred instructional mode to learner friendly delivery mode. The student is the centre-pin of the electronics trade learning. Electronics education is very important because learners who acquire skills in this area can establish viable small scale enterprises or gain employment in electronics based enterprises after graduation. Solid and durable foundations are needed through effective lesson delivery techniques. Teachers undoubtedly hold the key to implementing and sustaining the change within the classrooms and workshops. In doing this, they must demonstrate the value of life long learning by seeking professional growth through seminars, workshops and other educational improvement. In this paper, goals of electronics education, instructional delivery techniques, need for teacher's professional growth and development have been discussed. It was emphasized that electronics learners should endeavour to acquire saleable skills through the instructional techniques discussed, and teacher should be professionally developed to ensure functionality through the application of the learner friendly techniques enunciated in this paper.

Introduction

Electronics is a fascinating and skilled based subject. Electronics education is that education provided for learners who are preparing to undertake the servicing of electronics gadgets and systems in the world of paid employment.

National Business and Technical Examination Board (2004) specified that Electronics Technology modules should be as follows:

CRT12 - Electronics devices and circuits
CRT13- Radio and audio frequency amplifiers
CRT14- Radio systems
CRT15- Television II

It is expected that these modules will serve as avenues for laying strong electronics education for learners in that vocation. Okoro (2006) pointed out that vocational education provides the skills and knowledge, required for employment in an occupation. Electronics education is not necessarily narrow, but it also involves the total environment in which the workers work as well as the intellectual process involved in making a living in the world of paid employment.

Based on this knowledge, the workshop electronics teacher should enable students respond to the new paradigm of learning which is learning how to learn. Mbakwe (2007) agreed that this is what makes for continuity and sustainability in education and reduces the incidences of students dropping out of school. It is imperative that the electronics instructors must believe in their learner's ability to learn. Maduewesi (2003) pointed out that this is to

guide them to learn by doing. In electronics, teachers should encourage learners to experience events rather than regurgitating them in examinations.

Goals of Electronics Education

Electronics education is one of the vocational courses taught at technical colleges, polytechnics, colleges of education (Technical) and some faculties of education in universities in the country. The National Policy on Education, (2004) stated the goals of vocational and technical education to include:

1. Provision of trained manpower in applied science, technology and commerce; particularly at sub- professional grades.
2. Provision of technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development
3. Providing people who can apply scientific knowledge to the improvement and solution of environmental problems for the use and convenience of man.
4. To give an introduction to professional studies in engineering and other technologies
5. Giving training and impart the necessary skills leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self – reliant and
6. To enable our young men and women to have an intelligent understanding of the increasing complexity of technology.

Electronics education is one of the technical courses offered in the affected institutions. It is anticipated that equipped with the knowledge of the educational goals, the instructors should be able to select the objectives that are feasible and can be pursued and attained in the classrooms, or workshops.

The electronics teacher should be capable of selecting the most appropriate content and learning experiences that would enable the learners achieve the stated objectives and determine the most suitable mode of delivery to be adopted and the most appropriate materials or resources and the best way to organize and integrate content and learning experiences that would enable teachers acquire necessary skills, knowledge and competencies. Much emphasis should be placed on the appropriate electronics content and materials, carefully selected and presented to the learner. Ndu (1989) pointed out that this will ensure that the proper learning opportunities and delivery modes are chosen to enable the teachers draw out the potentials in the learners as a way of ensuring their fullest, all round skill development.

Based on the foregoing, the electronics teachers are required to use a variety of stimulating learning resources while presenting lessons at the classrooms or workshops to challenge the learners in participating in the activities so as to have the relevant experiences of what they are doing, thus learning effectively.

Improving Electronics Teacher Quality

Electronics teachers are the pivot on which skill acquisition of learners revolves. He is the ultimate model of the learner. The Federal Republic of Nigeria (2004) in the National Policy on Education and with regard to vocational and technical teacher education, reported that:

> *Government is aware that only limited facilities exist for technical teacher Education. A conscious effort to expand the facilities for the training of technical teachers is being made particularly since the new structure proposed for secondary school education will require many more teachers. Accordingly, a second National Technical Teachers College is being set up……..In addition, some of the colleges of technology, polytechnics have*

started N.C.E technical and commercial courses and these will be expanded, (page 19).

The technical and vocational teacher education provisions for the country is still insufficient. Okoro (2006) pointed out that it was previously assumed that no special programme for training of vocational teachers was necessary, that what vocational teacher needed was skill in his trade. Except electronics teachers are well trained in pedagogical skill, they cannot device or cope with the current electronics learner techniques for effective teaching of their trades. The electronics teacher must seek professional growth for optimum performance. The teachers must regularly participate in professional seminars and workshops to update their skills and effectiveness. Furthermore, electronics teachers need such techniques as peer coaching, research, curriculum development, mentoring and many other ways to grow as professionals who are using current techniques in the electronics instruction.

Electronics Learner Friendly Instructional Delivery at the Technical Colleges

There are teaching methods and instructional strategies which take cognizance of the learners interests, needs, problems, hopes and aspirations while providing adequately for their full engagement or active participation in learning activities. These are discussed below:

Generating Classroom Activities to Help Children Express their Feelings

This strategy is premised on the fact that "the brain does not separate emotion from cognition." Maduewesi (2003) pointed out that giving children outlets for them to share their experiences and express their concerns and fears can sometimes make them feel better. Telling and re-telling them about the impact of electronics in the world of technology creates a sense of sequence, coherence, and control over events that seem chaotic, confusing, or over whelming.

These can be achieved by:

i. Encouraging class interactions in which learners can organize and build projects to give them a sense of mastery and a chance to organize what may be chaotic and confusing events in electronics technology.

ii. Asking learners to draw electronics diagrams guided by the teacher and show strategic points in the diagram that will initiate practical interest in learners. The learners will then be given the opportunity to talk about what they have drawn and may be grouped in small units. This may allow them to share their experiences and discover that others share their mistakes or mastery. The anxiety raised from this practice will be eased. Ibeh (2004) pointed out that unless the tension and anxiety in learners are released, no effective learning may take place. Further more, this practice will enable students in future to learn to control emotions and express their skills in the right context in confidence.

iii. Giving discussion that can allow students to express their skills, to understand and be reassured that many of their reactions are normal and not crazy, and aid them to come to an understanding of what reliable skill in electronics means. Guided discovery can help students decide for themselves the best way to understand electronics systems.

Field Trips

Electronics teachers can take their students to visit specific places where electronics work is practically carried out, like the Electro – hall (Nig) Limited that deals on assorted electronics gadgets and production. Mkpa (2003) suggested that learners may be asked to make observations of such trips and on the basis of which they would write an explanation later.

Further, how to carry out electronics servicing or construction can be learnt through a well – coordinated field trip. Students could be asked to pick up the terms or electronics parts or systems they had seen during the trips and expatiated on them. They can also ask teachers questions to clarify any misunderstanding. They can also be asked to compare the actions they saw during the field trips with the ones they saw during regular class sessions. In this way, learners are exposed to meaningful contexts and may later be required to make use of what they had seen during the trip. Mbakwe (2007) stated that field trip is a very valuable method of teaching which provided the most realistic means for the study of real things and real processes in their actual environmental setting. The usefulness of field trips is epitomized in enabling the learners to gain first hand information by providing them the opportunity to see and possibly, touch and feel what they have heard about in the classroom or school workshop.

In field trips, the learners are opportuned to smell (perceive), touch; see, taste and hear in the learning process. Abdullahi (1982) in agreement with the aforestated facts, pointed out that in field trips, when well planned, afforded the pupils the opportunity to become actively engaged in observing, collecting, classifying, studying relationships and manipulating objects. In electronics instruction, this technique of learning is very important as it creates permanent learning and skill acquisition. These skills form the bed rock of a life – long learning engagement when required. Mbakwe (2007) stated that field – trip is a child – friendly instructional delivery mode in the sense that it caters for the interests of the learners, provides rich learning experiences in their natural settings and orients them towards meaningful activities. In a well coordinated electronics instruction, field-trips are inevitable and should be properly integrated as a plausible technique to thoroughly teach electronics in a practical way.

Provision of Learner Friendly School Environment

Adequate school environment is a sin qua non for smooth acquisition of electronics skills by learners. Agusiobo and Olaitan (1985) pointed out that vocational education will be efficient in proportion as the environment in which the learner trains is the replica of the one in which he must subsequently work. Training on the job itself ensures the understanding of electronics skill. Okoro (2006) emphasized that the jobs given to the learners while in training should not be pseudo exercises, but real jobs with real tools and real machines, turning out real products. These real products are the real resemblance of the types learners will subsequently produce in the real world of paid employment.

The emphasis on development of skills worldwide, today is focused on creating learner friendly school environment. This is the environment in which there are abundant provision of facilities such as adequate classrooms, workshops, materials, practical accessories and other raw materials, machines and equipment. Ibeh (2004) agreed that all these were required in adequate and appropriate number as to meet the ever increasing students' enrolment figures. Students learn how to use these equipment only when they handle and practice on them at required intervals of their school, or training period in the school workshops. As students of electronics operate the equipment, they experience them and thus become equipped for further learning and subsequent application of what they learn to the world of work. Perfection of students' skills can be realized when they experience and carry out exercises by themselves and discover their own unique ways of using those equipment to develop their skills for subsequent application in the world of work.

Utilization of Positive Reinforcement

Electronics students need proper motivation through rewards, rather than scolding and punishment in the classroom, or workshops. It is known that electronics is a fascinating subject and children are poised to work hard, especially when they are motivated. Ndu (1988) identified the factors that affect motivation and reinforcement of learning to include; use of pleasure and pain principles, punishment and blame, competition and co-operation, raising of inspirational level, feed back to students, goal setting and involvement of students in learning activities.

In electronics instruction, the level of difficulty of what students are taught should be followed both in the classroom and the workshop. This should be designed to meet the aspiration of students. The electronics instructor should organize activities in such a way that students should keep striving and giving a promise of goal attainment in the workshop. Every novelty created by the teacher in an electronics class, creates resounding interest for students. While presenting novelty, Mkpa (1985) suggested that the differences between the new and the old and their relationships should be pointed out to ensure clarity. The subject matter should therefore be presented in a variety of ways to bring novelty in the instruction. A competent electronics teacher in trying to bring in reinforcement in his lesson, must create psychological and social needs for learning in his students. Classroom and workshop learning should be related to future life of the students and they should be actively involved in learning the electronics tasks.

Positive reinforcement, such as rewards and encouragement produce and promote pleasant association with the desired behaviour for which the student is rewarded. The association thus created, motivates the student to repeat the desired behaviour. Ono and Onu (1999) pointed out that when a teacher expresses, "well done, that is fantastic, well presented or exhibits broad smiles and nods head in approval, the student so rewarded becomes elated, sees himself as a hero and is encouraged to do more. Under this condition in an electronics class, his classmates would want to imitate the appreciated student so that they too can be praised, thus, learning is undoubtedly enhanced in the workshop and classroom.

Creativity in Classroom Teaching

Creativity as a classroom and workshop concept impacts on the process of rearranging or recombining instructional ideas for effective delivery of electronics course in the best mode that can make learners acquire the desired skills. The creative teacher comes up with new ideas and imaginations on how to present electronics lessons competently. Mbakwe (2007) pointed out that the initial step in teaching for creativity is to create a conducive classroom climate. Thus, a democratic workshop or classroom lends itself to creative development and such classrooms or workshops allow the students' freedom of expression and fear is dispelled. Creative classroom is where the instructor accepts and encourages unique responses from learners, and when they are wrong in answering questions, the creative instructor politely encourages the learners and motivates them so that they do not withdraw to their shells when next they are needed to make responses in the classroom or workshop.

In electronics classroom or workshops, the instructor should use the teaching techniques that encourage divergent reasoning so that students can think in a flexible manner and apply originality in their imagination. Electronics students should be exposed to challenging tasks, experiments and other events that would warrant discussion, inquiry and project building.

Conclusion

The main trust of this paper is that electronics learner – friendly instructional techniques are the keys to effective learning of electronics in the contemporary classroom and workshops in schools. The paper examined the goals of electronics instruction and the instructional delivery modes that revolve on learners' interests, active participation in the classroom and workshop instructions and the teaching of the required skills in electronics technology as taught in technical institutions.

The essence of equipping electronics workshops in the institutions where they are offered is necessary for proper skill acquisition by learners. When the skills in electronics technology is acquired, learners can be efficient in establishing electronics based workshops or enterprises in the nation, and this will undoubtedly reduce unemployment among the youths.

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