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ENHANCEMENT OF TERTIARY INSTITUTIONAL WORKSHOP AND PRACTICES AS A STRATEGY FOR INCREASING INNOVATIONS IN TECHNOLOGY EDUCATION

Odesanmi A.[1] , Vanduhe F.W.P. [2] Balogun, A.O.[3] , Mohammed, I.A.[4]
E-Mail Id: odesanmiatinuke@gmail.com[1], faluv91@gmail.com[2], gani4change@gmail.com[3], isaaliyum11@gmail.com[4]
[1]Department of Vocational and Technology Education, Abubakar Tafawa Balewa University, Bauchi
[2]Department of Management information systems, Cyprus International University
[3,4]Department of Vocational and Technology Education, Abubakar Tafawa Balewa University, Bauchi

Abstract-To Foster innovation substantially in technology education, there is the need to expand tertiary institutional workshops as well as reform the pattern of workshop practices among students in the area. This work therefore describes enhancing of workshop and practices among students as a strategy for increasing innovation in technology education. Using relevant literature, this paper addresses areas such as; conceptual definitions in relations to technology education, workshop practices in Nigeria institutions, present state and challenges of technology education practical workshops in Nigeria, the need for the improvement of technology education workshops and practices, developmental strategies for the improvement of technology education practical workshops and practices. It then concluded that enhancing workshop and practices in tertiary institutions will allow student to put their creative thoughts into actions, create more rooms for teamwork, facilitate good students and lecturers/instructors relationship as the lecturer/instructor will as such be able to understand better the student conception and develop plans on to build on them thereby increasing innovation in technology education as new ideas will find their own ground into practices as well as existence.

Keywords: Enhancement, Tertiary Institutional Workshops, Practices among Students, Innovation, Technology Education

1. INTRODUCTION

Innovative development of any nation depends strongly on the strategies it continues to lay down for itself, as these strategies will have short and long-time effect on it economy and should be open and subjected to review. [11] stated that vocational and technical education is intended at increasing not only applied skills but also outlooks and behaviors that makes the beneficiary a inventive, pioneering and ingenious person. Similarly, [4], stated that vocational education and training makes learners for vocations that are centered in manual or applied activities, conventionally non-academic and entirely connected to a definite skill, career or vocation. As such it becomes very clear that technology education in Nigeria is not assuming it full potentials. [16] quoted Fritz to have put forward that the traditional pedagogy of workshop-type technical subjects was, and still is, in many cases, 'demonstration and follow'; he said it has been used to good effect in the development of student aptitudes, chiefly in industrial skills. However, technology education's evolution is transforming the subject from one that requires learners to imitate teacher-prescribed industrial hand- and machine-skills to one that is argued as being unique in the school curriculum. Technology education has been developed as a subject aimed at promoting an individual learner's ability to solve real-world problems by integrating specifically relevant knowledge of structures, materials, technological processes and systems. The world presently has witness a lot of innovative development, this development covers almost every sector, some of which include areas such as; automotive, building/construction, electrical/electronics, health and information technology. In all of these areas of inventive growth, China as a country has performed significantly great that we can hardly check from 1 to 10 among the things we use, without finding at least one that is a product of China, you'll wonder less why [15] wrote in his article published by the telegraph that "China has transformed itself from being seen as "the world's factory" to becoming a garner of expertise revolution, with philosophies that vault the West". He went added to say that China are the Mobile payment leader, Artificial intelligence pioneer and finally, he defines them as Social media center. To ascertain his argument, he backed his reports with some study, for example for the Artificial intelligence pioneer he said:

"Chinese companies are also experimenting with artificial intelligence in bold ways. Search engine giant Baidu recently unveiled the world's first AI park in Beijing, and last year the Chinese government announced its intention to surpass all Western nations in terms of implementing AI. "China is currently the second largest investor in AI enterprises after the US and has ambitions to be the global leader by 2030," says Simon Bussy, head of wealth domain at financial services consultancy Altus Consulting. "It is already the leader in fusing AI with fintech. "An affiliate of [online retailer] Alibaba has made AI-powered technologies a key driver for expanding its businesses, improving customer service, detecting fraud and anticipating issues."

In another development, Scott (2019) said that "What was once a question of whether China can revolutionize has become one of how it is doing so". Certainly, it is a question worth asking, the question we are asking is that if China can, can't Nigeria too? Perhaps this groundbreaking development might have been vulnerable so far by concerns which might include margins in our schools' workshops and the method of practices among students.

2. THE CONCEPT TECHNOLOGY EDUCATION

[6] Defines technology education as the study of technology, in which learners "learn about the methods and knowledge related to technology". [2] advanced the statement by saying that as a field of study, it covers the human aptitude to form and alteration to the physical world to meet desired wants, by operating resources and tools with techniques. It discourses the detach amongst varied practice and the privation of knowledge about methodological mechanisms of technologies used and how to fix them.

Likewise, [10] define technology Education as a unified, experience-based instructional program intended to fix learners to be informed about technology-its development, structures, know-hows, application, and societal and cultural significance. According to them, it results in the application of mathematics and science concepts to technological systems in areas such as, but not limited to: construction, manufacturing, communications, transportation, biotechnology, and power and energy. They further said, Students are challenged to discover, create, solve problems, and create results by using a variation of apparatuses, machineries, computer systems, resources, methods and technological systems.

Another writer [17] said, Technology education is the study of technology. It is intended to impart learners to be equipped for a number of technology-related pitches, and to learn about technology within definite fields of study. Teachers cover topics related to technology processes, concepts and knowledge. According to him, the expansive viewpoint of technological education is that learners study best by doing, so the syllabus embraces an activity-based and project-driven approach.

A more rapidly look at these description makes it much robust that technology education holds a lot of groundbreaking abilities and can perform an important role in the inventive and technological development of any nation if given the chance to adopt it full potentials.

3. PRESENT STATE AND CHALLENGES OF TECHNOLOGY EDUCATION PRACTICAL WORKSHOPS AND PRACTICES

Eexperiment that technical and vocational education are very much still ignored in the aspect of adequate fund, employees, modern amenities, staff motivation which subsequently are raiding the country of the fiscal growth to be contributed by graduates of technical/vocational education. Equally, [16] maintains that in Nigeria the present state of technology education services is very poor; there is no strategic means to mending wrecked and dented tools or means of procuring first-hand tools. [16] furthermore, add that there is slight or no concern on the part of government, teachers and students for the improvement of the present state of facilities. [13] pointed out that technology education departments in some Nigeria tertiary institutions do not have laboratories or workshop space let alone usable equipment and facilities and where they exist, they are grossly inadequate, as the laboratories only have the items or equipment that were provided when the departments were established. He further stated that, surprisingly most technical education departments still depend on engineering workshop and lecturers to teach technical education concepts in this 21st century. He describes such act as shamefully and as a high degree of irresponsibility on the part of the operators of this programme. [19] opined that inadequate and ill-equipped Technical Education teachers are challenges to the implementation of Technical Education curriculum.

The greatest challenge facing and TVET and development in Nigeria are the notorious and perennial lack of power supply. Nearly all known vocations required for national development rely on efficient and stable electricity supply. Most private entrepreneurship that grew from the community development initiatives of the oil companies have folded up for lack of public power supply [5]

A research carried out by [20] on Assessment of Workshop Adequacy and Training Facilities in NCE (Technical) Institutions in the North-Eastern States of Nigeria, reflects that the problems technology education workshops includes issues like; inadequate space as the number of students entry outnumbered the amount of workshops space, the research also indicated that the problem of inadequate space also hinders the installation of machines and other

workshop facilities, according to them, the problem of space subsequently makes practical lessons to be conducted in tight and difficult condition.

Lastly, the research reveals that training facilities such as the school workshops, machines, equipment and funds were grossly inadequate with the exception of audio-visual aids and the manual for various machines. After a careful review of the result of the research, the researchers thereafter concluded that practical class could not be done adequately and demonstrated as a result of short in supply of training facilities which affect the practical skills of the students. In addition, they said, Since the study confirmed gross inadequacy of workshops and could be generalized to all the schools and this includes the workshop inadequacy based on rated and enrolled students per trade, inadequate of floor space per shop based on average class-size and inadequacy of training facilities. The findings, enunciated above, although obtained from observing the facilities both (human and materials) and the state of Colleges of Education Technical in the north eastern states alone may not quite different from what is obtainable in many schools situated in various parts of the country (Nigeria) because the schools are all running the same system. Therefore, whatever remedies are proffered to reduce the effect of the identify obstacles should as well apply to the others.

4. THE NEED FOR THE IMPROVEMENT OF TECHNOLOGY EDUCATION WORKSHOP AND PRACTICES

The 1991 World Bank policy emphasized on the enlargement of a skillful labour force as a vital factor for the growth of any economy. Comprising the private sector, employers of labour and training institutes can be the effective and effectual mode to improve the skills of the work force. [14] advises that where tools and apparatuses are not useful or where their facility is insufficient, technology training programmes will grieve and will lead to the making of unqualified employees who are unemployable and fruitless.

[21] stated that the requirements of sufficient and applicable structure are necessary to the educational course but shortage and inaptness in Nigeria system funded to a fall in educational standard. [19] posited that the value of education hinge on the resources such as human, material and financial supply. When these are not appropriately put in place in adequate measures, the aims and purposes of TVET teacher education is conquered. According to [19] a competently trained TVET teacher anywhere in the world needs didactic material/facilities to be effective, and the significance of the resources and their provision cannot be gainsaid.

[12] emphasized that the obtainability of suitable services augments learner education by letting learners get involve in demonstrations and to carry on to building their expertise through practice. To acquire the right skills needed for wider choice of jobs and career paths, well equipped laboratory and workshop becomes critical [5].

[13] stated that technical education is the training of technically oriented personnel who are to be the initiators, facilitators and implementers of technological development of a nation. He opined that this training of its citizenry on the need to be technologically literate, would lead to self-reliance and sustainability. He stressed that technical education more than any other profession has direct impact on national welfare. A deep reflect on [13] view will make us to understand that, allowing technology education to assume it full potentials by providing all the necessary workshops tools and equipment alongside with re-strategizing on workshop practices, will lead to substantial technological development which in another word can be referred to as innovations.

[16] pointed out that the quality of technology education programmes is greatly determined by the number of students who acquire the skills for the economic development, knowledge and values needed by society.

It cannot be an over-statement to say that technical and vocational education is the engine of economic growth. No country can arraign a war without an army. In the same vein, Nigeria cannot advance without well-resourced technical and vocational institutions. It is a missing connection in Nigeria's growth strategy [4].

5. DEVELOPMENTAL STRATEGIES FOR THE IMPROVEMENT OF TECHNOLOGY EDUCATION PRACTICAL WORKSHOPS AND PRACTICES

In addressing problems related to technical and vocational education generally, [9] posited that; Sufficient funds should be allotted to technical and vocational education. Insufficient resources affect the endowment of requisites such as well-furnished laboratories and workshops, relevant textbooks and training manuals, vocational and technical education involves skillful and expert teachers. Teachers training should be given precedence consideration. There is the necessity for systematic professional preparation for teachers of technology to elevate their expertise. Periodical industrial teaching for teacher is a sine-qua-non furthermore, to keep them up-to-date with the technical changes in the industry, There is the requisite for our technical institutes to introduce good liaison and ties with alike institutes overseas as this will stimulate collaboration and exchange of thoughts and augment technological transfer. By doing this the technical institutes will have entrance to innovative growths, exchange programmes and other various reimbursements accessible at those institutes

whose technical programmes are technologically advanced, Where there is alliance amongst technical institutes and businesses, the connection will allow the parties increase in value and apprehend their necessities and offer accurate results for the reimbursements of the society and that the prospectus taught in our vocational education institutions should be revised to meet the demands of the labour market. Lastly they highlighted that there is requisite to begin training of industry-based increased employment prospects for graduate of vocational and technical institutions. It will also offer bounteous chances for out of school.

[20], Counsel to the ruling classes involves that they should guarantee providing of ample workshop and training amenities to meet the challenges of the modern world of science and technology. [3] propose that the scheme should be designed in such a way that the education received should match to the necessities of the students and those of the society at large. [1] postulated that the importance in reeducating should be in the field of applied skill in the underprovided areas as well as the necessary instructional skills. In, [7] put onward that the education setting should be a carbon copy of work setting.

[5] proposes that; Management should provide TVET workshops with contemporary tools and machineries to enable TVET instructors and learners exercise their knowledge using a model of what should be acquired in the place of work and as well carry out communally appropriate research. Furthermore, lay emphasis that; TVET instruction exercise assessment form should be revised to evaluate the cognitive, psychomotor and affective domain in the knowledge transference. Learners can attain the accurate expertise only when they are taught with the exact implements, tools and machineries in a conducive surrounding. There is an imperative requisite for Management to form a strong basis for the compeers, communication and dissemination of unswerving power across the nation. Nigeria stands the possibility of being deserted by this particular reason of inadequate power supply.

CONCLUSION

The need for the enhancement of technology education workshop and practices in tertiary institutions cannot be overemphasized. it will allow student to put their creative thoughts into actions, create more rooms for teamwork, facilitate good students and lecturers'/instructors relationship as the lecturer/instructor will as such be able to understand better the student conception and develop plans on to build on them thereby increasing innovation in technology education as new ideas will find their own ground into practices as well as existence.

RECOMMENDATIONS

The following recommendations were made based on the findings of this study

- Government and other regulatory bodies should adequately fund and provide modern facilities in order to enhance the applied abilities of the learners.
- There should be adequate and well-equipped Technical Education teachers for efficient application of Technical Education Curriculum.
- The problem of epileptic power supply should be addressed as some of this workshop equipment are electrically driven.
- Government should address the problem of inadequate workshop space and laboratories as this hinders the installation of machine and other workshop facilities.
- The need for systematic professional exercise for instructors of technology to advance their abilities on a periodical base.

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