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On

DEVELOPING TECHNICAL AND VOCATIONAL EDUCATION/ TRAINING (TVET) AS TOOLS FOR TECHNOLOGICAL AND INDUSTRIAL DEVELOPMENT FOR A SUSTAINABLE NIGERIAN ECONOMY

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APPLICATION OF IT IN FACILITATING TVET FOR A SUSTAINABLE NIGERIAN ECONOMY

BY

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INTRODUCTION:

Technical and vocational education and training (TVET) has been the most effective human resource development strategies worldwide. TVET prepares trainees for jobs that are based on manual or practical activities, traditionally non-academic and totally related to a specific trade, occupation or vocation. Vocational education gives priority to expanding specific occupational skills and emphasizes the preparation of students to enter into the field of work [1]. In the past, TVET was focused on specific trade such as welding, automobile mechanic etc and it was therefore associated with the activities of lower social classes. However, as the labour market becomes more specialized and economies demand higher levels of skill, TVET has become the bedrock for technology and industrial development. TVET has diversified over recent times and now exist in industries such as production, tourism, information technology, cosmetics etc.

Information and communication technology (ICT) is a convergence of information theory, telecommunications and computer technology. The correlation between information and poverty has been widely acknowledged by the information society [2]. The main proposition given were as follows: information leads to resources, information leads to opportunities that generate resources; access to information leads to access to resources and access to information leads to access to opportunities that generate resources. We are in the information age, where knowledge is a critical resource and information is a primary commodity, in fact the uninformed poor has also become the resource poor. Therefore, in order to develop with the information age, there is a need to make ICT development a priority in Technical and Vocational Education and Training institutions which are the engine of our industrialization and economic development.

SUSTAINABLE ECONOMIC DEVELOPMENT

It is heart warming to note that as a nation, we have realized the inherent potentials of TVET for a sustainable economy and are working towards harnessing

this. A formidable TVET is the bedrock for innovation and technological breakthrough. No research finding will see the light of day if there are no competent technologists to translate them into realities. Modern trends have shown that organizations, especially banks will only employ those who are computer literate for effective financial bookkeeping and other transactions.

Economic Sustainability is achieved through clearly identified information, integration, and participation formats and these are the key building blocks that help countries achieve development economically and of cause technologically. Everyone should therefore be a user and provider of information for sustainable development.

Economic sustainability stresses the need for nations to change from old sector-centred ways of doing business to new approaches that involve cross-sectoral co-ordination and the integration of environmental and social concerns into all developmental processes [6]. A sustainable economic development can only be achieved if there are clearly defined goals and information provision is the key driving force.

IMPACT OF INFORMATION TECHNOLOGY ON TVET FOR FASTER TECHNOLOGICAL AND INDUSTRIAL DEVELOPMENT:

Technology is a creative purposeful activity aimed at meeting needs, wants and opportunities through making products and offering services according to previously defined goals [3]. TVET is the core of technology and industrial development and for Nigeria to take her rightful place in industrial advancement she has to embark on technology education using the most efficient tool which is Information Technology (IT).

There are three kind of technological education:

1. General technology education in school aimed at giving pupils basic technological knowledge and skills in technology literacy
2. Vocational Education; training in vocational schools, colleges and universities (TVET)

3. Life long retraining and in-service training.

Effective utilization of technological education takes place after one has acquired TVET, and this is very crucial in the industrial development of any nation. The rapid pace of technological change infact, has lead to fast changes to both the content and methods of technological education.

Information technology education play a special role as IT is the subject of education and the instrument for it. As we speak, IT is applied as subject in education and instrument for it world wide; bodies exits and hold conferences annually to review and improve on IT utilization in TVET. One of such bodies is the ORT (Obshestro Remeslennogo Truda) translated as the society for handicraft labour, its reach spans five continents with activities in over 100 countries amongst which are Russia, Israel, India France South Africa, Spain USA etc. all of which are making their mark in the world industrial power. These countries prepare ICT based curricula aimed at teaching technological skills and training students to function in a technological environment, and view technology as an integral part of daily culture, they share IT based resources. ORT technology centers operated in these countries have a site http://doit.ort.org. This is a foundation course in information technology and a typical example of ICT based training.

Nigeria as a nation has to employ modern technological training methods in her TVET institutions making IT as the training base. In this regard, students can study programming , computer design, web design, video technology, computer aided design / CAM etc. They will also be used to prepare reports and presentations by use of MS word, MS excel, Corel draw, Corel Photo-paint, electronic dictionaries and encyclopedias, internet etc.

INFUSION OF INFORMATION TECHNOLOGY IN TVET DELIVERY

That Information Technology should be infused into our present TVET system is a crucial necessity, Nigeria cannot afford to continue to remain in isolation in a technological age. In order to ensure the infusion of IT in TVET delivery, the following measures should be implemented;

(i) **IT based projects/assignments:**

Students should be given IT based assignment and projects. This will help the student to acquire skills in searching, assessing and selecting information as well as in the use of computer based tools and techniques

(ii) **Functional Information Space:**

Every TVET institution should have and run a functional information space called website. This space should provide real time information connection between school administration, students and even parents.

(iii) TVET institution should operate an internet based on a database that hold the complete portfolio of each student. Students should be able to find in it their current time-table, e-books, educational research etc. Also students can use the internet for searching for information globally while studying.

(iv) **Training of IT Teachers:**

Effective IT use at school is not possible without efficient manpower. Teachers should be given seminars and continuous training, and retraining in order to effectively infuse IT in TVET delivery.

(v) **Model TVET Centers:**

The Government should set up model TVET centre with well equipped IT laboratories, media library and network centers. This centre is recommended for each zone, for a start, and should be used for training and be standard models for all other technical and vocational institutions.

(vi) **IT Specialization:**

It is recommended that information technology courses be offered in TVET institutions. These are courses like computer programming, computer architecture, operating systems concept, UNIX, computer maintenance, WEB design, computer network operations etc.

(vii) **Integration into Traditional Technologies:**

IT should be integrated in our traditional technologies and offered as courses in our TVET centres, An example is computer aided fashion design, where the computer is used to generate patterns in batik design, leather works, etc.

(viii) **E-Learning:**

E-learning centres should be provided and use of e-exams will help in enforcing common educational standards and coordinating training activities

(ix) **Entrepreneurship:**

There is the need to encourage entrepreneurship while in training and on graduation, graduates of TVET centres should be assisted to set up their own businesses. This will ensure developmental sustainability. What the graduates of TVET institutions do after school has a lot of impact on the future industrialization of the nation. TVET institutions should keep in touch with graduates and assist in establishing them. For instance, an automobile maintenance graduate should be assisted to set up a modern IT based workshop where computers are used for diagnoses and thereby render efficient services.

INFRASTRUCTURE AND INSTRUMENTS, PRIMA FACIE TO TECHNOLOGICAL AND INDUSTRIAL DEVELOPMENT

There are basic Infrastructures that has to be put in place by any nation that desires technological and industrial development. Some of the key infrastructures and instruments required are;

(i) **Energy:**

Adequate power supply is a major infrastructure that holds the life line to technological and industrial breakthrough. Best practices cannot be implemented without this vital resource. The Government while working on meeting the energy needs of this nation can also look at the means of providing this infrastructure by use of renewable sources of energy; this include small solar energy plants for TVET institutions

(ii) **Collaboration:**

Development of collaboration between IT industry and TVET institutions through training research development and capacity building is of vital importance. This collaboration should be extended to universities and research institutions where challenges are collectively resolved and update done for sustainable development.

(iii) **IT Based Curricula:**

There is the need to develop and implement an IT based curricula in our TVET institutions, with measures put in place for continuous review and update. IT has to be an essential part of the curricula and well as learning tools, this will improve the quality of learning process to meet with international standards and modern challenges.

(iv) **Qualified Personnel:**

Development of qualified teachers is paramount to attaining technological development. The relevant bodies should focus on providing qualified teachers in material/substantial mastery of instructional methodology in the field of IT. We are in a knowledge era, where knowledge is money and the key to knowledge lies today in Information. Great efforts should be made to train and retrain interested individual so as to have qualified hands in our TVET institutions.

(v) **Networking:**

There is the need to create an information network throughout the TVET institutions and centres and also establish links with other bodies and institution within the continent and globally in other to share resources and up-date knowledge.

(vi) **Infrastructural Building:**

Provision of an IT infrastructural building is paramount to industrial development. The vocational school that proposes to have an IT centre should meet the following basic requirements;

- Have 3 rooms, 2 rooms computer library and 1 room will be a digital library.
- Have capable resources in IT field with international certification; and
- Have the experience to manage school information networking, and active in some activities related to Information Technology

(Based on recommendations given at the 10th SEAMEO INNOTECH International Conference, November 2006)

CONCLUSION

The 'expatriates' we employ today are products of TVET institutions in their countries. They have been trained in the use of modern design tools which are IT based. Except we incorporate modern information technology into our TVET curricula, we will soon be faced with a situation where foreigners like technicians from Indian, China, Taiwan etc will flood our country to render simple services as vulcanizing, welding, car maintenance and even shoe cobbling, while our youths roam the streets with plates in hand begging for alms.

I want to use this opportunity to call on the Niger state government to implement the TVET policy measures and recommendations that will be developed from this workshop in other to realize her vision 3-2020.

Sustainable Technological and Industrial development is possible in Nigeria as we have the human resources. All that is required now, is '*to do that which needs to be done*' and Nigeria will be the better for it.

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