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**INFORMATION TECHNOLOGY SERVICE PROVISION  
IN TECHNICAL VOCATIONAL EDUCATION AND  
TRAINING (TVET): IMPLICATION FOR SUSTAINABLE  
DEVELOPMENT IN 21<sup>ST</sup> CENTURY NIGERIA**

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**Abstract**

*The provision of technology information services for effective technical vocational education and training (TVET) programme in Nigeria is a sine-qua-non for sustainable development in the 21st century. Access to, and ability to use information among Nigerians is one of the most important factors that can sustain Nigeria as the giant of Africa and enable it achieve its dream as one of the twenty largest world economies by the year 2020. The main drivers of ICT in TVET emanate from attempts to meet the demand of maturing or emerging knowledge economies which includes keeping pace with ICT and new technologies in the workplace. TVET is a type of education which prepares individuals for the world of work and also is a viable tool for sustainable development. The economic and*

industrial development of any nation in the 21st century is propelled by effective integration of ICT in TVET through the provision of technology information services. This is saddled with several challenges like infrastructure-related challenges, availability and accessibility of information technology resources and poor funding. Recommended among others, improved maintenance culture on systems and ICT tools and regular facilities upgrade. Government and relevant stakeholders should improve budget allocation for adequate funding. Also, the private sector should contribute in both financial and material resources toward the provision of technology information services for effective TVET programme in Nigeria. The implication of ITSP in TVET for sustainable development in the 21st century is that TVET can now aim to reach its full potential. Today information technology has been integrated in the process of education and training, leading to a new concept of e-learning and GTVET.

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ABSTRACT

The provision of technology information services for effective technical vocational education and training (TVET) programme in Nigeria is a sine-qua-non for sustainable development in the 21st century. Access to, and ability to use information among Nigerians is one of the most important factors that can sustain Nigeria as the giant of Africa and enable it achieve its dream as one of the twenty largest world economies by the year 2050. The main drivers of ICT in TVET emanate from attempts to meet the demand of managing or emerging knowledge economies which includes keeping pace with ICT and new technologies in the workplace. TVET is a type of education which prepares individuals for the world of work and also is a viable tool for sustainable development. The economic and

## **Introduction**

The 21st century falls within the epoch called the Information Age. The concept of the Information Age epitomizes the changes brought about by technological advances and globalization toward the end of the 20th century (Dike, 2007; Oladele, 2008; Ogunsola, 2005). This epoch is characterized by speed and precision in the production, transfer, access and use of knowledge (Chakrabarti, 2001). Information and Communication Technologies (ICTs) drive the new economy and human capital through TVET as its fuel, while Information Technology Service Provision (ITSP) is the mechanism that facilitates sustainable development in the 21<sup>st</sup> century. According to Ayodele (2007), sustainable development is the ability of the economy to support the needs of the people of a country over a time, taking into consideration the economic, social and ecological constraints of the country. Sustainable requirement implies the fulfillment of the needs of the present generation which should not compromise the ability of future generations to meet their own needs.

Technical Vocational Education and Training (TVET) is one of the recognized and effective processes by which quality, up-to-date information, literate and knowledgeable workers are prepared, trained or retrained worldwide. UNESCO and ILO (2002) defined TVET as a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. This means that TVET prepares human resources for the ever-changing world of work, for effective participation in the world of work the study of technologies and related sciences as reflected in the definition. It can be realized with adequate ICT arrangement in TVET institutions.

TVET draws its foundation from technological innovations. One of the major challenges facing TVET is staying abreast of technological developments occurring in business and industry in order to ensure that all graduates are workplace-ready in a context of declining resources. The use of ICTs in TVET provides opportunities for developing more innovative ways to bridge the gap between laboratories and workplaces. The need for recurrent education and the changing labour market conditions, call for flexible access to TVET. Continuing education models that will meet workers' lifelong learning needs have to be relevant and flexible to provide just-in-time learning without distance. ICT can play a crucial role in removing distance from education and in developing a lifelong learning culture in TVET. In spite of these potentials, little is known regarding the usage of ICTs in TVET and the medium of service provision referred to as Information Technology Service Provision. The purpose of this paper is to bridge this knowledge gap. The paper also focuses on the usage of ICTs in TVET and various ways of Information Technology Service Provision, challenges encountered and the way forward.

## **Education for Sustainable Development**

There is no clear road map to achieving sustainable development. There is, however, a considerable amount of consensus that the most successful approach will involve the collaboration between stakeholders and education. The United Nation (UN) believes that education can play a vital role in driving sustainable development and has declared 2005-2014 the Decade of Education for Sustainable Development (UNESCO, 2006). Education for Sustainable Development (ESD) is considered as a learning process or approach to teaching that is based on the ideals and principles that foster sustainability and provide quality education for human development, learning to know, learning to be, learning to live together, learning to do and learning to transform oneself and

society. According to UNESCO, ESD allows every human being to acquire the knowledge, skills, attitudes and values necessary to shape the sustainable future by including key sustainable development issues in teaching and learning. More people at all levels must be enabled to develop the values, attitudes, and skills worldwide.

Information sharing creates awareness, ensures continuous use of products and services, provides feedback and support for organization. Any organization or government that has current and useful information is empowered to enhance productivity and good governance. Dike (2007) sums up the new world order where the position of nations, their power, wealth and influence, increasingly depends on their access to and ability to use information. In addition, ICT for sustainable development, represents a catalytic process for social change that seeks to foster, through education, training and public awareness; the values, behaviours and lifestyles required for sustainable future. It is about learning needed to maintain and improve the quality of life of generations to come. It is about individuals, communities, groups, businesses and governments living and acting sustainably, as well as giving them an understanding of the environmental factors, good moral behaviours and economic issues involved (Ayodele, 2007).

### **TVET and Sustainable Development in the 21st Century**

TVET is the systematic and orderly transmission of knowledge, skills and values to develop a workforce that is able to enhance productivity and sustain competitiveness in the global economy (Man, 2005). It encompasses the ability to accelerate economic growth, provide marketable labour supply, minimize unemployment and underemployment, infuse technical knowledge and reduce poverty. TVET refers to all measures whereby people acquire skills that provide them better access to employment and income. Chepkemei, Watindi, Cheron, Ng'isirei, and Rono

(2012), opined that TVET is understood to be:

- An aspect of lifelong learning and preparation of a responsible citizenry.
- An avenue to prepare for occupational fields for participation in the world of work.
- An important part of education and an instrument for development

TVET has numerous goals which vary from country to country. In Nigeria, TVET is part of the formal education system incorporated in the three levels of education (primary, secondary and tertiary) with a view to meeting the nation's needs for skilled manpower and enhance the economic status of the individual and the nation in general.

The goals of technical and vocational education according to the Federal Republic of Nigeria as provided in the National Policy on Education (FRN, 2013 P. 30) are to:

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

From the foregoing, it is important to note that skills and knowledge are the engines of economic growth and social development of any nation (Goel, 2010). According to Odu (2011), TVET involves those experiences whereby an individual is equipped to carry out any useful occupation successfully. These experiences may be organized and institutionalized or unorganized and haphazard. TVET is that aspect of education that exposes the learner to acquisition of demonstrable skills that could be transformed into economic benefits (Akerle, 2007). Technical Vocational Education and Training (TVET) holds the key for training the skilled and entrepreneurial workforce needed for the

changing technological workforce (Afeti, 2010). This implies that TVET is part of the nucleus of sustainable development of both industries, human capital and the economy. Majumdar, (2009) in affirmation, noted that since education is the key to development, TVET is the master key that alleviates poverty, promotes peace, conserves the environment, improves the quality of life and helps achieve sustainable development.

Greening TVET (GTVET) is an emerging concept emanating from UNESCO-UNEVOC as part of fulfillment of UN's decade for ESD. Majumdar (2010) described it as a way of thinking in a sustainable manner as it relates to acquiring, consuming and disposing of utilities; as proactive actions aimed at promoting human well-being and social equity while significantly reducing environmental risk and ecological scarcities. On transformation of TVET, Majumdar (2012) emphasized that greening TVET plays an important role in transition to green growth and green societies to create a sustainable future, requiring a workforce with the appropriate skills and training to meet the demand of the everchanging labour market. GTVET therefore, contributes in closing this gap by integrating ICTs into TVET through effective Information Technology Service Provision (ITSP).

### **Information Technology Service Provision (ITSP) for Sustainable TVET**

The aim of TVET is to prepare people for self-employment and to serve as a medium of evolution for people in the world of work, by making individuals to have a sense of belonging in their communities. Consequently, TVET is seen as an instrument for reducing extreme poverty (Hollander & Mar, 2009). These distinctive features of TVET make ICTs application a mandatory component that can help in achieving a sustainable and globally-recognized workforce. ICTs according to Zarini et al. (2009), facilitate the development and strengthening of TVET around the world by

enhancing networking and knowledge sharing opportunities'. The implication is for TVET institutions to further deploy and strengthen their commitment to training and producing "ICT-capable" graduates that can withstand the challenges of virtual workplaces. Thus, knowledge in the exploitation of ICTs is critical to the present-day workers.

Information Technology Service is a professional service department in TVET institutions at various levels that provide information technology services to the library, computing, e-learning, and media service centres for students, teachers, researchers, administrators and visitors.

To achieve these objectives, Information Technology Service Department acts as:

1. Service providers seeking to continuously improve delivery of customer-focused services through a cycle of planning, implementing, checking, and effecting corrective actions where required. It is committed to the principle of continuous improvement by actively monitoring performance, results and the opinions of customers to feed into the planning and development of services provided
2. Leaders in innovation delivering institution-wide initiatives that meet institutional objectives through effective implementation of best practices, business processes, technologies, change and project management, and
3. Experts in frontline services and model design which is central to students' learning and skill development. Also, responds to and engages with students as well as anticipating their future learning needs, among others.

The department provides the following services:

1. Procurement and sales of ICT equipment and consumables, including binding and specialist printing services.

2. **Multimedia Services** including specialist staff, software and loan equipment. It facilitates off-air recording and filming services to departments.
3. **Videoconferencing facilities** including booking facilities and desktop conferencing, Institution teaching spaces (lecture theatres and seminar rooms), including design, support for AV equipment, refurbishment, and timetabling
4. **Technology enhanced learning services.**

Some developed nations have mature models of ICT in TVET, particularly Australia, South Korea and countries in Europe. But many developing nations in South America, Africa and elsewhere are also exploring the potentials of ICT for more flexible and blended approaches and curriculum integration for the primary purpose of increasing access.

The information technology service department strives to be an approachable, responsive, flexible and alert to technological developments as well as reacting to developments in TVET institutions, research, scholarly publishing, and technology locally, nationally and internationally, through various types of ICTs commonly used in teaching/learning and communication. These include audiocassette tapes, radio, videotapes, CD-ROM, Internet/web-based training, audioconferencing, audiographics, interactive television, videoconferencing, and wireless technology such as electronic mail (E-mail): Which is the most widely used resource of the Internet. It is provided for sending and receiving mails (messages) through electronic devices. Intra and inter organizational communication has been made faster and cheaper. World Wide Web (WWW) is also an Internet-based resource. It is a utility based on hypertexts (Hypertexts simply documents through keywords in document or page). A visit to a website helps individuals or institutions to locate products,

information, pursues political or social agenda and transacts business (Chiwetalu, 2003).

It can be stressed that being on the web would put any nation or organization on the right course of speedy and sustainable development in line with the emerging changes in technology, economic and political paradigms. Consequently, many organizations, ministries and governmental parastatals have their own websites through which they make relevant information available to members of the public.

### Challenges

There are several challenges associated with the provision of information technology services for TVET sustainability in the 21st century. These challenges include the following:

1. **Availability and Accessibility of Information Technology Resources:** There is prevalent lack of availability and accessibility of library and information technology resources in Nigeria, which reflects the state of affairs in most developing countries. Thus, the developing countries in general are inflicted with "information poverty" due largely to the failure of library/information technology professionals to provide access to these resources. Poor indexing, abstracting and bibliographic work are evident. (Ochogwu, 2007).
2. **Inadequacy of Information and Communication Technology (ICT) Tools and Compliance:** Apart from the fact that many library and information professionals, support staff and ICT users lack ICT compliance and ICT education, many information technology services systems in TVET institutions lack ICT devices and tools. This is largely because of poor funding, arising partly from inadequate budgetary allocation. This state of affair is primarily responsible for lack of

technologically-driven information services provision, resulting in the prevalent inefficient and outdated library and information resources and services.

3. **Infrastructure-related Challenges:** In most developing nations, appropriate building structures with the required space, ventilation and proper electrical wiring are not provided to house the available equipment and facilities. In some cases, epileptic power supply courses the breakdown of the systems and activities of the department. Safety and security of these infrastructures are also areas of challenges considering the incessant protests of different interest groups and hoodlums within and around the TVET institutions.
4. **Poor Information Literacy.** Part of the explanation for negative disposition of information user communities in the country toward library and information services relates to poor information literacy culture among user communities in various respects which include:
  - i. Lack of awareness of information needs,
  - ii. Lack of awareness of information systems,
  - iii. Lack of knowledge or skills to exploit the information systems,
  - iv. Inability to evaluate accurately the information at hand, and
  - v. Poor knowledge of ICT infrastructure and utilization.
5. **Lack of maintenance culture:** ICT facilities need regular maintenance in order to sustain their maximum life span: However, most of the developing countries neglect maintenance culture and this negatively affects ICT equipment and provision of information technology services for a sustainable TVET in the 21<sup>st</sup> century.

### **Implications of ITSP in TVET for sustainable development in the 21<sup>st</sup> century**

New Information and Communication Technologies have dramatically changed the way we live, learn, and work. While these changes have brought about considerable challenges to TVET, they have created new opportunities for change and innovation. In the past, the status and condition of vocational education did not match the importance of its potential contribution to society. However, in this new environment where human capital has become the most critical element in achieving a competitive advantage, TVET can now aim to reach its full potential through effective Information Technology Service Provision (ITSP).

The implications of information technology on TVET for sustainable development, has impacted on different sectors of the Nigerian economy and capacity building. It is a truism that information technology is very indispensable to Nigerian sustainable development drive. Today information technology has been successfully integrated in the process of education and training, leading to a new concept of e-learning and GTVET. The potential benefit of information technology to sustainable development in Nigeria has been accepted as an imperative paradigm.

### **Conclusion**

Information is an essential requirement for the development of any nation. The application of information technology has emerged as the most radical development in the 21<sup>st</sup> century. It has facilitated speedy information transmission, high level decision making and has reduced cost in resources/organizational management and equally opened vast opportunities for information sharing among individuals, companies and governmental institutions. The provision of information technology services to TVET institutions is a positive step toward making information

widely available to the students, teachers, researchers, administrators and other TVET stakeholders to access and use to develop TVET activities. The numerous challenges identified in connection with the provision of information technology services includes amongst others, quality accessibility, connectivity, inadequacy of financial, material and human resources for the upgrading and training/re-training of workers. Endeavours toward surmounting these problems through the proactive actions of information professionals in collaboration with the government and private/public sector is of paramount significance in TVET sustainable development in the 21st century.

### Recommendations

1. Proactive approaches in the provision of information technology services by information professionals will facilitate availability and speedy accessibility of quality services to users within and outside the TVET institutions.
2. The government and relevant stakeholders should improve budgetary allocation for adequate funding. Also, there should be private sector contribution in both financial and material resources.
3. Integration into Development Programmes and Services such as The United Nation's Millennium Development Goals (UN MDGs), World Bank Loans, National Development Plans and the Education Trust Fund (ETF), to contribute in funding TVET.
4. Institutions for professional education and training of professionals should improve and expand their programmes so as to produce larger numbers of well-trained people who would be proactive in the provision of library and information services.
5. Government should create monitoring and evaluation team in respects of the ICT facilities distributed to the various TVET

intuitions, to ensure they are properly maintained and cared for.

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