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EXCELLENCE IN TEACHING AND LEARNING OF TECHNICAL, VOCATIONAL EDUCATION AND TRAINING (TVET) PROGRAMMES USING BLENDED LEARNING IN NIGERIAN TERTIARY EDUCATION INSTITUTIONS

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ABSTRACT

In this 21st century, teaching and learning of TVET programmes require modern approaches to ensure excellent delivery of instruction so as to achieve desired learning outcomes. Blended learning model which is seen as combination of online solution and tradition or face to face approach is needful if TVET graduates would transform the world of work and industry. Hence, this paper examined excellence in teaching and learning of TVET programmes using blended learning in Nigerian tertiary education institutions. Some concepts such as TVET, blended learning, excellence, teaching and learning were reviewed in the paper. The paper further discussed the contributions and benefits of teaching and learning of TVET programmes to students and national development, benefits of promoting excellence in teaching and learning of TVET programmes through blended learning in Nigerian tertiary institutions education, and ways of achieving excellence in teaching and learning of TVET programmes using blended learning. The challenges facing blended learning model in teaching and learning of TVET programmes in Nigerian tertiary institution were also discussed. Way forward for using blended learning in teaching and learning of TVET programmes in Nigerian tertiary education institution were provided in order to conclude the paper.

Keywords: Excellence, Teaching, Learning, TVET, Blended learning, Tertiary, Education, Institutions

Introduction

In this 21st century, technology and students have been changing rapidly and it is evident that as we live in this era of rapid technological changes which modernizes the teaching and learning processes, industrial practices and every aspect of individual lives. It is important that every educator should embrace “the New digital reality of the online computerized world” (Jukes, 2008: 6). The changes in technology determine the skills required by graduate in the labor market,as Well created additional new demands for more adaptable multi-skilled and creative labor (Bashir and Mohamad, 2014). The technology driven environment has openedup variety of educational delivery models that enable studentsto increase their level of assimilation and makes for flexibility in learning new information andacquire skills to meet up with the challenges of the rapid changing world. However, these delivery methods range from the face to face teaching method in a classroom to distance learning approaches where participants do not meet eachother.This emerging technology has made it possible that various modes of teaching and learningto be used in the delivery of technical vocational education and training (TVET) for excellence. These include web-based instruction, e-learning, m-learning, e-

tutoring, e-monitoring, hybrid courses and blended learning models which is the main focus of this paper. Besides, teaching and learning as described within the context of this present paper entails the act of passing or delivering instructions to students which will bring about permanent and positive changes in behaviour. Excellence on the other hand, can simply be described as the quality of excelling, of being truly the best at something by possessing good qualities in high degree.

Blended Learning therefore, is a form of learning that is facilitated by the effective communication of different modes of delivery, models of teaching and styles of learning (Adam & Nell,2009).In Submission of Woodal, (2012)blended learning is effective, affordable, and responds to students and teachers growing interest in technology - based learning experiences. Aliyu (2012) advocated that blended learning is the best option for Technical Vocational Education and Training (TVET) students in order to live and work effectively in this 21st century. According to UNESCO cited in Mar(2011) TVET comprises "those aspects of the educational process involving to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge related to occupations in various sectors of economic and social life" Todays digitalization of TVET programmes expect their learning environment to include technologies that would enhance learning speedily. Ogbuanyas and Udougo (2015), opined that for Nigerians to join the league of nation to enjoy the dividends of TVET, it is deemed necessary that blended learning is incorporated in teaching and learning of TVET courses to blend traditional approaches and digital trend in Nigerian institutions. Hence, Excellence in teaching and learning of Vocational Technical Education and Training through the use of Blended Learning Model in Nigerian tertiary Institutions which is the main thrust of this paper should be highly encouraged in tertiary education institutions. The paper however has been organized in different sections in other to discuss issues surrounding the topic.

Technical and Vocational Education and Training (TVET)

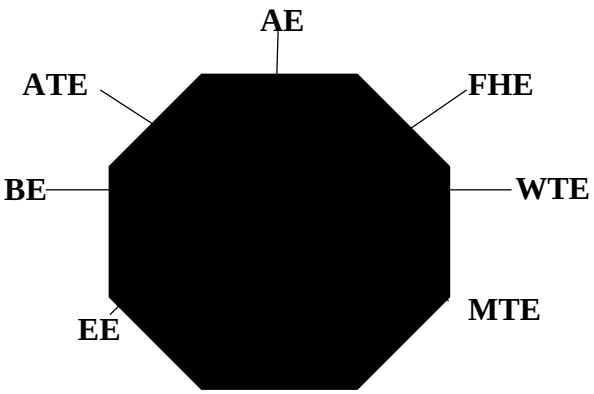
Technical and Vocational Education and Training (TVET) is part of general education which refers to a range of learning experiences that are relevant for employability, possession of competencies and qualification skills for decent work and lifelong learning related to world of work (Latchem, 2017). This implies that TVET is an aspect of lifelong that encompasses all learning activities purposefully undertaken throughout lifespan for the development of competencies and qualifications in a job/career to fulfill many social justices and achieve sustainable economic development objectives including employment. The concept 'Technical and Vocational Education and Training' (TVET) was first used in UNESCO congress in Seoul, Republic of Korea 1999. It was a consensus term used to describe the diverse and complex vocational education and training offered in forms of apprenticeship programme, vocational education, technical education, career and technical education, workforce or workplace education, and workforce development (UNESCO – IBE, 2012). The term technical and vocational education refers to aspects of educational process involving in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, knowledge, understanding and attitudes relating to occupations in various sectors of economic life (ILO, 2000).In view of Simon (2017) TVET is concerned with the acquisition of knowledge and manipulation of employability skills for world of work.

TVET Systems in Nigerian Institutions

TVET delivery systems vary from one country to another at different levels and in different types of institutions. In Nigeria, TVET is delivered as a formal, non-formal and informal education. As a

formal education 9-3-4 system of education, it is offered at the tertiary institutions like Universities, Polytechnics, Monotechnics and Technical/Vocational colleges for a period ranging between 3 to 5 years depending on the type of program. It is also offered at the post-basic Schools called Technical Colleges for 3 years; while at the basic Schools, it is offered in Vocational/Craft Centers for 3 years and in primary schools as inductor/trajectory/exploratory vocational subject to stimulate pupils' interest in TVET. As non-formal education for short term skill acquisition programs while as informal education, it is offered in form of apprenticeship program. Apprenticeship type of TVET programmes accounted for 90% of skill training in Nigeria (Simon, 2017). However, TVET programmes within the context of Nigerian tertiary education institutions include; Agricultural Education, Automobile Technology Education, Business Education, Electrical Education and Electronics Education, Metal Work\Mechanical Technology Education, Woodwork\Construction Technology Education, Food and Home Economics Education among numerous others. This has further been illustrated in a diagram below in figure 1.

Figure 1: Illustration of TVET System



(Adapted & culled out from Dopemu [2016]. Up skilling requirements of automobile mechanics for modern vehicle repairs and maintenance in Kaduna State, Nigeria. Unpublished Masters' Tech Thesis, Department of ITE, Federal University of Technology, Minna- Niger State, Nigeria p.232)

The objectives of TVET programmes for tertiary education institutions in Nigeria have further been stated below:

Purpose of the Study

The Objectives of TVET, according to Federal Republic of Nigeria (FRN, 2013) include the following:

a. Provide trained manpower in Applied Science, Technology and Commerce particularly Art, Advanced Craft and Technical level;
b. Provide the Technical Knowledge and Vocational Skills necessary for Agricultural, Industrial, Commercial and Economic Development;
c. Provide people who can apply Scientific Knowledge to the improvements and solutions of environmental problems for the use and convenience of men;
d. Give an introduction to professional training in Engineering and other Technologies;
e. Give training and impart the necessary skills leading to the production of Craftsmen, Technicians and other self-reliant individual; and,

f. Enable our young men and women to have an intelligent understanding of the increasing complexity of Technology.

Given the above objectives, teaching and learning of TVET in the Nigerian tertiary education institutions has made tremendously contributions to national development which have been enlisted in the next section.

Contributions and Benefits of Teaching and Learning of TVET Programmes to Students and National Development

Benefits to Students*:*

When TVET students/graduates skills are on constant development, it is has various benefits amongst which are;

a. Increased productivity and efficiency.
b. In touch with new technology hence exposure to new ways and methods of doing things.
c. Reduced error as a result of possession of right skills.
d. Keeping up with industrial changes hence the ability to handle increased workloads.

Built up confidence because of increased innovation strategies

Contributions of TVET to National Development:

In a nutshell, Atsumble, Raymond, Bargu & Owodunni (2013) summarized the Following of TVET as being the contribution of TVET to National Development:

i) TVET assist nations in developing policies and practices concerning education for the world of work and skill development for employability and citizenship.
ii) TVET contributes to increased opportunities for productive, sustainable livelihood, personal empowerment and makes and socio economic development especially for youths, girls, women and the disadvantaged.
iii) TVET helps to restore human dignity through skill empowerment and makes recipient secured from poverty.
iv) TVET reduces inequality, filling income gaps that would otherwise exist between the rich and the poor.
v) TVET reduces crime and high cost of combating crime.
vi) TVET reduces migration and offsets the high rate of brain drain among others. It has been proved beyond reasonable doubt that TVET have significantly improved the development of several countries of the world.

Given all these students benefits and contributions of TVET programmes towards national development, need be to support excellence in teaching and learning of the programmes with the used of blended learning. Although, there are few challenges which have warranted the utilization of blended learning in the tertiary institutions. These challenges with great consequences on students' enrollment and curriculum have created difficulties on attainment of excellence in teaching and learning of TVET programmes in Nigeria. UNESCO (2012) opined that despite the laudable advantages of TVET delivery in tertiary institutions in Nigeria, students' enrollment into the programme has been poor, which could be attributed to ineffectiveness of teaching and learning excellence through blended learning. Additionally, providing quality curricular and pedagogy also suffers due to inappropriate use of blended learning in promoting excellence in teaching and learning of TVET in tertiary institutions (ILO, 2015).From the foregoing discussions, further explanations have been provided in to buttress points on the need for use of blended learning to promote excellence in teaching and learning of TVET programmes in Nigerian tertiary education institutions. Hence, the

definitions and benefits of blended learning disclosed in the next section.

Blended Learning

Blended learning is primarily a learner-centric approach that offers learners' autonomy and flexibility throughout their learning process. According to Thorne (2003), blended learning can consist of PowerPoint slides in a classroom lecture, extra homework online after a face-to-face class, or a classroom where the lecture is recorded and available online, and the class time is used for discussion and questions about the video. Blended learning could also consist of a completely re-designed course in which careful choices are made about what is done online and what is done in class (i.e., a hybrid). The author emphasized that hybrid or flexible learning requires the redesign of teaching to enable students to do the majority of their learning online and come to campus only for specific in-person sessions (e.g., laboratories) that cannot readily be done online. Blended learning is combination of multiple approaches to learning (Ibe-bassey cited in Okoye&Ifejika, 2017). It is also defined as a situation where different delivery methods are combined together to achieve quality instructional delivery (Kurma, 2008). Blended learning embraces various combinations of classroom presence and online study, as well considered a mainstream approach to learning in most educational institutions. The method combines "brick-and-mortar" attendance with teachers in face-to-face classroom practices and computer-mediated content and delivery. In addition, the method has focused 0n achieving institutional objectives by mapping out new strategies to address challenges students face especially in delivery of TVET programmes. Several studies such as Bubas & Rermek (2017) have shown that blended Learning blends traditional and e – learning. In such a case, overcomes the learning difficulty among students. The concept of blended learning is sometimes used synonymously with the terms hybrid learning, personalized learning, technology enabled (enhanced) learning, and differentiated instruction (Commonwealth of Learning, 2015). In submission of Olelewa (2014), blended learning is a shift from teacher - centered to – student – Centered approach which emphasizes more 0n peer – to – peer learning. In view of McKee, (2016) blended Learning is also a suitable means of implementing e- learning solutions in an institution. The author further stated that this approach combines the best practices of both traditional and online education bearing in mind the following factors; specific attributes of course content, available resources, level of faculty competence to develop online education materials, instructional design models, and the number of students and their readiness to access, adopt and effectively utilize online course materials. Blended learning is a technology in the form of teaching methods combing several teaching and delivery methods (Olelewa, 2014), it does not require the physical presence of both the teacher and the student. The students to a very large extent controls the time, place and path of program delivery. Garrison and Kanuka (2004) added that blended learning combines internet with digital media and classroom teaching methods in order to bring about optimal level of teaching and learning.

Benefits of Promoting Excellence in Teaching and Learning of TVET Programmes through Blended Learning in Nigerian Tertiary Institutions

The Dreambox Learn (2013) summarized benefits of blended learning into two: teachers' benefits include; acquire global knowledge, Inventiveness,

i. Improves efficiency
ii. Saves money
iii. Personalizes learning
iv. Provides better student data
v. States common core standards
vi. Ensures easy communication with both students and parents
vii. Create, delivers and analyzes formative and classroom assessment

viii. Enriches professional development
ix. Manages professional development

Ways of Achieving Excellence in Teaching and Learning of TVET Programmes using Blended Learning

In the Nigerian context, TVET teachers are fond of "using old weapons to fight new battles", that is, conventional way. The general practice is that instructional delivery is done using predominantly the traditional approach where the teacher is seen as "the owner and sole giver of knowledge" whereas the students are seen as "passive receiver a non-owners of the same knowledge" (Simon, 2017). With this approach, when assignments and tasks are given, are expected to work as lone\individuals to show their capabilities. This, they do by relying heavily on textbooks, teachers notes\instructions and very little research and consultations with others. The teacher gives most of the information and expects correct answers to validate students' lessons. Learning is achieved through repetition with much emphasis on basic concepts or routine skills sets. The teachers adhere strictly to exhausting particular content area of the curriculum. In this delivery approach, assessment is viewed as a separate entity from the teaching task, and is mostly paper-and-pen kinds of assessment. All this practice is different from what exists in the well-developed societies like in the advances countries like the United States.

In well-advanced and transformed global settings, with the new paradigm shift in education that involves blended learning, for TVET teachers to be effective and excellent in teaching and learning, they must develops additional skills. Palmer (2015) added that such teachers should be; learner centered, possess the ability to use Smart Digital devices, able to collaborate effectively with others, able to think outside the classroom box an innovator and a teacher that would help the students to become teachers. In submission of Simeon (2017, p.8), constructivist delivery approach should be used in teaching of TVET programs to make teaching and learning excellent. Thus, the following six approaches are employed;

- **Structured Collaboration**: The teachers should create teams of three or more to work on an in-depth project for three to eight weeks as the case may be. This would connect the learners to what real world problems are as such there would be no false assumptions. It encourages students to work together as they approach the problems with diverse ideas and diverse concepts.
- **Student Driven**: This approach is achieved by allowing students to take control of their learning while the teachers become the facilitators, guiding learners through the learning content as planned. The teacher introduces a complex entry questions that establishes what students need to know, and scaffold the project with activities and new information that deepens their work.
- **Multi-Faceted Assessment**: Assessment of the learner outcome is integrated throughout the learning activity, using various tools and methodologies. The teacher therefore Schedules the projects through plans, drafts, or timely benchmarks.
- **Real World Connections**: the teacher arranges for the team's presentation to an outside panel of experts drawn from stakeholders, parents or the immediate community. This helps to connect learners to real life situations.
- **Democratic Environment**: this emphasizes on making the learning environment to be interactive, the focus is the big concept not on limited concept. Meanwhile, as the teacher facilitates the class, the students creates their own knowledge and understanding using primary resources with interactive materials.
- **Open-ended Question**: in this approach, assessments are interwoven in the teaching, and this occurs in many different ways thus; test, observations and students points of view

focusing on realistic approaches to solving real world problems.

- **Core Learning**: this approach teaches learners on how to learn a concept by exploring the real content through brain storming and critical thinking.

From foregoing statements, the following ways of achieving excellence in teaching and learning of TVET programmes using blended learning model are added by (Palmer, 2015) as follows:

1. E- Learning software: This teacher uses e-learning software to develop self-learning in students. It is a digital learning content which is provided on an encrypted USB drive which can work with any PC using windows. This software can be used in teaching technical\practical related topics to students.
2. Use of online tools: The teacher introduces students to an app to advance their knowledge make them to be digital literacy as he\she uses it to deliver lessons and give assignments. Such apps like zoom, WebEx, and Skype have been illustrated in the picture below.



Figure 2: **Use of Online tools in the Classroom**

3. Use of multimedia web-based resources: Teachers select website closely related to the curriculum. It helps the teachers to build lesson plans, list lesson objectives, design web-based handouts, reserve space for writing notes and have assessment plans for the students. The teacher as well shares visuals, video clips, audio files to illustrate points while engaging students on arguments through visual and audio stimuli examples of multimedia; animation, videos, sounds, graphics and text.
4. Create a blog spot: The teacher creates a blog spot for collaborative platform where students can share their assignments, ask questions, post topics

related to the class whatsapp group chat.

5. Create a classroom page online: This serves as a centralized place where the teacher uploads reading, assignments, notes, announcements and other materials for the class.
6. Use of video or audio recording: Record yourself giving a lesson with audio or video recording capabilities of one's computer or electrical device to document the teaching. Save the file with a title of the lesson and upload it to a web host. This makes lesson available to students.
7. Design a set of collaborate task: This requires students interaction, brainstorming, creativity and critical thinking skills.
8. Teaching the effective use of Wikipedia: Understanding how the online encyclopedia helps students to learn how to conduct research and be able to distinguish between facts and friction.
9. Use of flipped classroom model: This is blended learning models that uses online video and other resources to prepare students before they come to the class. It helps the students to learn the theory online and use the classroom or face-2-face approach for practical. The teacher guides and mentors them in the class. Example is YouTube.

The applications of all the above blended learning model when effectively utilized will bring about excellence in teaching and learning of TVET programmes in Nigerian tertiary education institutions. However, there some challenges affecting the use of BLM in teaching TVET programmes in Nigerian tertiary education institutions which has equally been discussed under the next section.

Challenges of facing the use of Blended Learning Model (BLM) in Teaching TVET Programmes in Nigerian Tertiary Education Institutions

Graham, Allen and Ure (2005) as cited in Olelewe (2014) identified six major challenges facing effective use of BLM include:

i. **Finding the Right Model**: The most difficult challenges lies in identifying the instructional strategies that match well with the conditions that are present in two different environments. It is a complex challenge because it relates achieving the right blend. Both face-to-face (F2F) and computed-mediated (CM) learning environments have affordances that endow them with particular strengths and weakness.
ii. **Increased Demand on Time**: Adding an online component to the face-to-face course puts increased time, demands and stress on the teachers as well as the department or the institution as the case may be in developing the blended course, which might make teachers not want to utilize this process.
iii. **Institutional Culture**: Students tend to procrastinate when they have little contacts. They not complete online courses because they lack the discipline or the motivation to do so. Some instructors or teachers may hesitate to try blended learning approaches because they are not sure if they do would get the support of management.
iv. **Inadequate Infrastructure**: Limited infrastructure especially telecommunication networks and services supported by steady energy supply continue to elude our institutions.

v. **Limited Access Internet\low Internet Penetration**: Most colleges and high schools in Nigeria lack functioning internet centers required for blended learning. Although agencies like PTDF, TEDFUND and ADB intervene from time to time to provide this facilities, they are still inadequate and the available ones are often ill-maintained.
vi. **Insufficient Allocation of Fund to Education**: Limited facilities as a result of limited fund. Budgets allocation to education in Nigeria still hovers between 6% and 1% - a far cry from UNESCO's recommendation of 26% (Simon, 2017).

Others include low awareness on the use of blended learning model in teaching and constant power failure. Given the above challenges, there is a way forward to improving the use of blended learning in promoting excellence in teaching and learning of TVET programmes in Nigerian tertiary education institutions.

Way Forward

Blended Learning in teaching and learning of TVET programmes is powerful for many reasons if well designed, it addresses learning difficulties among students (Woodal, 2012). Many institutions of all sizes are introducing blended learning in their teaching especially during period of outbreak of various communicable diseases like Corona Virus, 2019 (COVID 19) pandemic where teaching is done outside of the classroom setting. Given this present situations, many activities concerning teaching and learning in TVET has been put to a halt given that students cannot be reach through the old traditional or conventional way of instructional delivery. The blended learning enforces easy communication with students and parents; creates, delivers and analyses formative and classroom assessment; enriches professional development; and manages instruction and curriculum development amongst all.

However, some serious measures need to be taken to ensure all odds preventing proper incorporation of blended learning in promoting excellence in teaching and learning of TVET programme is ultimately used in Nigerian tertiary Institutions. Some serious measures such as provision of adequate infrastructure, sufficient funding, installation of Local Network System for constant connectivity and provision of electricity with constant power supply, among others, need to be adopted in order to ensure the excellent use of blended learning in enhancing excellence in teaching and learning of TVET programme. Meanwhile, to ensure proper development, incorporation and effective policy implementation of using blended learning in delivering excellent instruction in TVET programmes in the tertiary institutions, first of all, adequate ICT infrastructural facilities (for traditional and computer-mediated instructions), including learning equipment, laboratory\workshop materials and consumables, internet access and guaranteed energy supply should be provided. As a corollary to this, the Federal and State Government should stop paying lip services to funding of education as education in general and TVET in particular is capital intensive but, the socioeconomic gains of producing employable graduates who will help to turn around the fortunes of the country in the 21st century and reduce crime far outweighs whatever investment which may be made.

In addition, there should be a reorientation to drop cultural and institutional bias as such there is need for retraining of personnel in the design and implementation of right blended learning

models to ensure competency-based TVET programmes that will win support, interest and motivation of both teachers and students which is also tailored towards promoting excellence in teaching and learning. As well, the Nigerian Government should review the TVET policy with the best international standards and practices whose focus and bearing should equally center on achieving excellence in teaching and learning through the use of blended learning. Moreover, the Nigerian Universities Commission (NUC), National Commission for Colleges of Education (NCCE) and the National Board for Technical Education (NBTE) and other accreditation agents should ensure that tertiary Institutions acquire the necessary skills in using blended learning model in teaching and learning. Also, computer education should be made compulsory subject or course for TVET students in the tertiary institutions so as to enable both teachers and students to be computer literate.

Conclusion

TVET has been universally acknowledged as a viable programme for empowering the army of unemployed to become employable or self-reliant. The traditional instructional delivery approaches are no longer enough to achieve desired outcome in this digital and technological era. Blended learning models which has been previously indicated by scholars in the paper as a combination of online learning and face-2-face (F2F) approaches have been identified to be excellent in delivery of TVET programme. If institutional objectives must be met conscious efforts must be made by the institutions, government and stakeholders to refocus Nigerian tertiary institutions to embrace the blended learning models thereby eliminates the identified threats to the successful utilization of blended learning models.

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