Blended Learning Models: Imperatives for Refocusing Nigerian TVET Institutions for Effective Instructional Delivery in the Digital Era

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Abstract
In this digital era, teaching and learning require modern approaches to ensure effective delivery of instruction aimed at achieving desired learning outcome. Blended learning models lend themselves to unavoidable use in order to bridge the gap between the traditional approaches and the ever-expanding digitization trend in education. TVET which requires 21st century infrastructure and millennium curricular for its practical-oriented programmes, has a lot to benefit from blended learning models, provided they are well developed and supported. This paper explained the concepts of TVET, blended learning, digital era and effective instructional delivery. Therefore, it went on to critically examine the place of blended learning in effective instructional delivery; blended learning models and TVET in the digital era; and the challenges of blended learning. It concluded that TVET, acknowledged universally as antidote to unemployment and social vices, should now adopt blended learning models for better outcomes. It finally highlighted the ways forward as: providing needed infrastructure, re-training and re-orientation of teachers and students, and review of TVET policies to meet the best international standards and practices.

Keywords: TVET, blended learning, digital, effective instruction, challenges

Introduction

Technical and Vocational Education and Training (TVET) is seen in Nigeria and other countries as a tool for combating poverty and unemployment. Given the acute shortage of qualified manpower especially in technical and vocational disciplines, TVET is believed to be one of the main priorities that will greatly contribute to the socio-economic development of the country (UNESCO-IBE, 2012). Adebayo (2013) in Ogbuanya and Uduodo (2015) agreed that youth unemployment and its attendant rising wave of crime are part of the major social problems affecting the growth and development of Nigeria for a very long time. Indeed, if education is the key to any successful development strategy, TVET is the master key that can unlock the doors to poverty alleviation, to improving the quality of life as well as transforming the world of work and industry. In order to address the numerous issues confronting the TVET sector, various initiatives have recently been implemented, mostly in collaboration with national and international development partners such as UNESCO, World Bank, ECOWAS Commission, among others (UNESCO-UBE, 2012). Access to TVET is being expanded, concurrently with advancement of skills acquisition through provision of opportunities for public-private partnership (PPP) programmes, expansion of facilities and equipment, the development of teachers/trainers as well as training methods and models (Ogbuanya & Udodo, 2015). Training resources and methods are very critical to achieving learning objectives and these must not remain the same in this digital era. Traditional

approach to teaching and learning is no longer sufficient. For Nigeria to join the League of Nations to enjoy the dividends of TVET, it should review the present curricular and teaching models to match the trends of 21st century. The development of TVET in various nations of the world has lent itself to rapid change in technological advancement of the 21st century. For instance, Japanese educational system has gone padagotronics. There is today in the system intense and extensive use of electronics in teaching-learning processes (Okoli, Wejinya, Agam & Asufi, 2016). With the availability of state-of-the-art online learning technology, there is greater opportunity for acquiring the technology that can support TVET learning practices (Yasak and Alias, 2014). TVET has evolved from providing well-trained basic operators to providing professional knowledge workers (Wang, 2010). Today's digital native students of TVET programmes expect their learning environment to include technology because it is an intrinsic part of their lives (Blackboard Inc., 2009). TVET systems across the globe have witnessed a wide range of application of learning environments driven by technology such as MOOLs, OERs, Industry 4.0, blended learning, flip learning, among others.

Blended learning is the combination of multiple approaches to learning. It is usually used to define a situation where different delivery methods are combined together to deliver a course (Kurma, 2008).Blended learning which typically extends classroom instruction to online is giving institutions new approaches and strategies for addressing the challenges they face, particularly in the TVET sector. Therefore, the introduction of blended learning models together with the provision of needed facilities to drive same have become imperatives for refocusing TVET institutions in Nigeria for effective instructional interactions in this digital era.

Review of Key Concepts

TVET is viewed by UNESCO (2009) as learning aimed at developing skills in the practice of certain trades as well as learning aimed at preparing students for entry into labour market in general. In both cases, learning may be geared towards direct access to the labour market or lay the foundation for access to higher education and training with joining specific trades in view. TVET encompasses programmes that provide participants with skills, knowledge and aptitudes that enable them to engage in productive work, adapt to rapidly changing labour markets and economies, and equally participate as responsible citizens in their respective societies. The goals of TVET, according to FRN (2013) include among others: provision of trained manpower in the areas of applied sciences, technology, business, advanced craft as well as providing training and related skills for becoming self-reliant or employable.

TVET institutions are classified into formal, non-formal and informal. In Nigeria, formal TVET is provided in organized public or private institutions (primary, junior secondary, senior secondary, technical colleges/vocational training institutions, vocational enterprise institutions (VEIs)/innovation enterprise institutions (IEIs), tertiary institutions (polytechnics and universities). Non-formal takes place outside the formal system, while informal is provided by craftsmen and women in different trades in the informal sector of the economy (UNESCO-UNEVOC, 2006). Decree 9 of 1977 established the National Board for Technical Education (NBTE) in Nigeria, the main coordinating body for TVET. The NBTE is vested with powers of maintenance of standards in Nigerian technical institutions. This power is exercised through a variety of quality assessment processes including visitations for resource inspection and accreditation (UNESCO-IBE, 2012). TVET can immensely benefit from blended learning in this digital age.

Blended learning is a formal education programme in which a student learns at least in part through online learning, with some element of student control over time, place, path, and/or place; at least in part in a supervised brick-and-mortar location away from home; and the modalities along each student's learning path within a course or subject are connected to provide an integrated learning experience. It is also called hybrid learning or mixed-mode learning which combines teacher-led instructions, printed instructions, computer-mediated instructions and web-based assessments (Glossary of Education Reform, 2013; Christensen Institute, 2015). It is a broad term that denotes learning solutions that are based on a combination of face-to-face lecturing, self-paced e-learning, and the use of various Internet-based or other technologies (audio, video etc) to deliver the learning content (Bubas & Kermek, 2017).

Blended learning is not like other technology-driven movements in education. It is not about supporting current instructional models. In fact, the opposite is the case. It is about eliminating the "monolithic, factory-based architecture of today's school system (Nagel, 2011). It has six models: face-to-face, rotation, flex, online lab, self-blend and online driver with five different interactive modes which include: student-to-student interaction, student-to-teacher interaction, student-to-community interaction, student-to-material interaction and student-to-technology interaction (Dream-Box, 2013). Umeh, Ahmed and Sani (2014) also identified other models as Anchor-blend (online and classroom), Bookend blend (pre-class online activities), and Field-blend (anytime, anywhere online resources) – all for effective instructional delivery.

Key elements of effective instructional delivery, according to Barge (2014), include the use of multiple instructional materials, activities, strategies, and assessment techniques to meet students' needs and maximize the learning of all. These also include ensuring that the learning process and the outcomes of learning have authentic relevance with students' lives and interests as offered by the current digital era.

The concept of digital era or digital age and related terms vary among individuals, societies, regions and nations, and also over time. Moreover, there are a number of variables other than age that may help us understand the nature of students' use of digital technologies. Students of the digital era are variously referred to as Generation Y, Net-agers, Digital Generation, Digital Learners, Generation-Tech, Nexters, Digital Natives, New Millennia Learners, Screen Agers, e-Generation, App Generation, etc. (Gallardo, Molias, Bullen & Strijbos, 2015).However, one thing certain is that the digital era is characterized by imagination, speed of change and integration of technologies, experiences and disciplines (Mulla, 2016). Students of the digital era unavoidably need to learn in a digital interactive environment provided by blended learning model of instruction.

Utilization of BLMs for Effective Instructional Interactions

Blended learning model is powerful for many reasons. If well designed, it addresses more learning style requirements, a wider audience and increased performance or learning results (Woodal, 2012). More and more institutions of all sizes are introducing blended learning into their instructional programmes and they are discovering that this model is effective, affordable, and responds to students' and teachers' growing interest in technology-based learning experiences. According to Blackboard Inc. (2009), the model provides students online tools to supplement classroom instruction; extend learning beyond the classroom; tailor learning experiences for students based on their needs; engage students with online tools similar to those used outside the classroom; is generally convenient; ensures easy

communication with students and parents. Besides, it creates, delivers, and analyzes formative and classroom assessment; increases communication among teachers; enriches professional development; manages instruction and curriculum development; generates student, class and district performance reports; aids curriculum development as well as saves time.

Olelewe (2014) adds that constraints such as class size, course duration, and venue could be formidable barriers to blended learning but benefits include: an increase in active learning strategies used; a shift from a more teacher-centered to learner-centered approach; greater emphasis on peer-to-peer learning and a change in the way faculty allocates time, allowing for individual mentoring of students. Other prospects are speed – more content is delivered in shorter time; personalization – better student engagement and individual learning paths; simulations – low risk and cost effective; and flexibility – able to be changed locally and continually modified and updated (Mckee, 2016).

Blended or hybrid learning is a suitable means of implementing e-learning solutions in an institution. The 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 educational material; instructional design models; and the number of students and their readiness to access, adopt and effectively utilize online course materials. Several studies have shown that blended learning can overcome the gap between traditional and e-learning solutions, and also surpass both of those approaches in terms of effectiveness and student satisfaction (Bubas & Kermek, 2017).

The development and delivery of blended courses can be used to address a variety of institutional, departmental and student needs. For institutions, blended courses can be part of a strategy to compensate for limited classroom space, as well as a way to think differently about encouraging collaborations between faculty members and students. Blended courses for faculties or departments can be a method to infuse new engagement opportunities into established courses or, for some, provide a transitional opportunity between fully face-to-face and fully online instruction. For students, blended courses offer the conveniences of online learning combined with the social and instructional interactions that may not lend themselves to online delivery, e.g. laboratory sections or proctored assessments (UCF, 2016). According to U.S. Department of Education (2010), a 2009-2010 students' ratings of course modality (n=672,185) showed that blended learning ranked highest. Fully online courses scored 48.3%, face-to-face 48.2%, lecture (with classroom) 43.4%, lecture (without classroom) 41.6%, while blended learning had 51.2%. Faculty members also expressed clear willingness to continue teaching in blended modality. This statistics clearly attests to the acceptability and utilization of blended learning model for instructional interaction in the United States of America and this can be generalized to other countries' tertiary institutions. Nigerian institutions, particularly those offering TVET programmes, should not be an exception.

BLMs and TVET in the Digital Era

In the ongoing global debate on the role of Technical and Vocational Education and Training (TVET), UNESCO (2012) argued for profound transformations in the conceptualization, governance, funding and organization of TVET to ensure that the sector is capable of responding effectively to the many economic, equity and sustainable transformational changes of the 21st-century world. UNESCO also stresses the need for skills development for sustainable development in the knowledge society. TVET programmes as we know require not only face-to-face teaching but

also hands-on training and self-directed learning through online delivery. In other words, blended learning is the most apt model in this digital era (Latchem, 2017).

The essence of blended learning lies in the increased sensitivity to the needs of learners and greater insight into both the advantages and disadvantages of different media and communication technologies that can be used in the teaching and learning process for a specific topic. Another important element of blended learning is the utilization of most effective instructional design in the context of available technologies; the attributes of instructors and learners; and the specific learning content or subject area. TVET can benefit from the expansive blending of the components of integrated and collaborative instructions (Bubas & Kermek, 2017). Learning in the digital era is an active and constructive process rather than a passive and reproductive process; more data-driven, substantial and concrete; and the focus has now shifted from 'knowledge creation' to 'knowledge acquisition'. Actually, in the present age of digitization, learners want to learn anywhere, anytime, at own speed, through own ways and styles and at own terms and conditions (Singh, 2016).

The demand of TVET in the 21st Century cannot be met by bricks and mortar approach alone. In fact, the current TVET system was designed for the industrial society. A new model of learning – the blended type – is needed for the knowledge society which will include ICTs needed for flexible and blended approaches to learning (Richardson, 2012). E-learning solutions guarantees speed, personalization, simulation and flexibility (able to be modified and updated locally and continually). Information itself is now a commodity that is needed at specific times. You do not need to know it and remember it. Students only need to be taught to search, locate, process (manipulate), use and dispose of the information. One can think of it as "just-in-time" information (Mckee, 2016).

Sourcing and utilization of resource materials for the delivery of TVET has been improved with the effort of the practical initiative of the Joint Regional Program on Integrating ICT with TVET Systems in Manilla, Philipines. The rationale behind this initiative was hinged on the premise that technological innovations have reached the classrooms and training centers bringing limitless opportunities to improve learning outcomes (Akpotohwo, 2016).

For TVET program to function as a total transformation of the learner, Nwosu (2012) advocated changes in terms of quality instruction. This implies availability of classroom/virtual learning facilities by adopting quality ICT (QICT) resources which has offered unlimited access to knowledge and information on skill acquisition. Quality ICT refers to interactive communication tools that are useful for the transformation of learner and all the people involved in the instruction and training process. They are critical tools that can be used in preparing and educating students with the required skills. There are interactive and non-interaction QICT. Non-interactive include media like: films, filmstrips, television, radio, video cassette. This category promotes passive learning. Interactive QICT are media like: computers and telecommunication gadgets. This category has the potentials to provide higher interaction for users to develop their intellectual and creative skill abilities and value re-orientation compared with non-interactive media. Studies have shown the unquantifiable benefits of the use of these QICT media in the open distance learning (ODL) classrooms, workshops, laboratories and virtual learning environments. More difficult concepts are explained better through the QICT than through traditional teaching models. This enhances the effectiveness of information presentation and helps stimulate learners' interests in improving their outcomes and quality TVET (Ibe-Bassey, 2011; Iyamu and

Ogiegbaen, 2010). In obtaining the integration of ICT into teaching and learning process, all ICT frontline staff must,therefore, understand how education technology can support pedagogy, thus, resulting to better student performance (UNESCO-IBE, 2011).

Challenges of Utilizing Blended Learning Model in TVET Programmes

In order to identify challenges facing the application of blended learning models, it is important to investigate the components that form the learning experience and work towards finding the issues that might be causing a mismatch between the interactions used to facilitate learning and the individual characteristics and/or needs of the student (Draffan & Rainger, 2016). There are a number of challenges facing TVET programmes. In Nigerian institutions, for instance, there is rapid technological growth that is hard to keep up with as poor funding and inadequate facilities persist. There are not well equipped classrooms with the required gadgets. These result in irrelevance of the curricular taught in TVET programmes. Again, teachers are pushed into the traditional approach to teaching in this digital era and there is no paradigm shift. Teachers teach theoretically without the students having the opportunity to acquire the practical experience that is necessary in the programmes to make them self-reliant. The students are thrown into the job market ill-prepared and so unemployable (UNESCO-IBE, 2012; Okoli, Wejinya, Agam & Asufi, 2016).

Low level of teacher qualifications and teacher quality are also identified as factors contributing to the problems. Towards that end, the South African TVET sector introduced new career-oriented qualifications since 2007 (Marsh & Ngqondi, 2014). UNESCO-UNEVOC (2010) identified the challenges of aligning delivery to technology; high cost of access creating a barrier to universal access; inadequate government support; and absence of quality standards. Other challenges identified by Simon (2010) include: lack of harmonization of policies in making them relevant to all institutions; weak instruments for implementation; slow change in the mindset of management as well as instructors; marginalization of learners who are not favoured by geographical location and socio-economic status; and failure of policies to cascade to grassroots level.

According to Graham, Allen and Ure (2005) in Olelewe (2014), six major challenges facing effective use of BLMs include:

- Finding the Right Model: The most difficult challenge 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 computer-mediated (CM) learning environments have affordances that endow them with particular strengths and weaknesses.
- Increased Demand on Time: Adding an online component to a face-to-face course puts increased time demands and stress on the teacher as well as the department or the institution as the case may be in developing the blended course.
- Overcoming Barriers of Institutional Culture: Students tend to procrastinate when they have little contacts. They do 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 that they will get the support of management.
- Inadequate Infrastructure: Limited infrastructure especially telecommunication networks and services supported by steady energy

supply continue to elude our institutions.

- Limited Access to Internet/Low Internet Penetration: Most Colleges and high schools in Nigeria lack functioning Internet centers required for blended learning. Although agencies like the PTDF, TEDFUND and ADB intervene from time to time to provide these facilities, they are still inadequate and the available ones are most often ill-maintained.
- Continued Insufficient Allocation of Fund to Education: Limited facilities as a result of limited fund. Budget allocation to education in Nigeria still hovers between 6% and 13% - a far cry from the UNESCO's recommendation of 26%.

Similarly, Umeh, Ahmed and Sani (2014) identified cultural paradigm, design frameworks, bandwidth access, demand on time (for students and teachers) as well as procurement and maintenance of technology gadgets as key challenges.

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 era. Blended learning models which combine computer-mediated (CM) and face-to-face (F2F) approaches have been identified as unavoidable if the programme must meet the demands of this era. However, conscious efforts must be made to refocus Nigerian TVET institutions to embrace the blended learning models while all the stakeholders strive to eliminate the identified threats to the successful utilization of blended learning models.

The Way Forward

Some serious measures need to be adopted in order to ensure the refocusing of Nigerian TVET institutions for proper development and implementation of blended learning models for effective instructional delivery in this digital era. In the first place, adequate 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 service to the funding of education. 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 and reduce crime far outweighs whatever investment which may be made – at least the 26% UNESCO benchmark in budgeting for education should be met.

In addition, there should be a re-orientation to drop cultural and institutional bias. There is also need for retraining of personnel in the design and implementation of right blended learning models to ensure competency-based TVET programmes that will win the support, interest and motivation of both teachers and students. To that end, the Nigerian Government should review the TVET policy with the best international standards and practices in focus.

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