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Blended Learning as a Panacea for TVET in Covid-19 Pandemic Era

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Abstract Pandemic such as Coronavirus disease 2019 (COVID-19) originated in Wuhan, China, in December 2019 and was declared as a pandemic by World Health Organization (WHO) on 11th of March, 2020 after it has spread across many countries of the world. It has caused almost all the countries of the world to close their educational institutions for several months in the year 2020. The impact of COVID-19 on education especially Technical Vocational Education and Training (TVET) is more catastrophic in the history of the world because more than 2.0 billion students from across the globe have been affected by school closure. Most Nigerian students and other African or developing countries were more disadvantaged because most educational institutions in Nigeria still use the conventional face-to-face lecture method in normal classroom settings. This opinion paper highlights the impact of COVID-19 on TVET system in West Africa, managing TVET during COVID-19 pandemic as well as the challenges and opportunities of TVET in pandemic era. The paper proposed a blended learning model as the way forward to TVET in order to face the challenges posed by the COVID-19 pandemic in education sector.

Keywords

Introduction

The 21st century education calls for personalised, productive and collaborative teaching and learning experiences that are expected to transform the entire education system from traditional face-to-face (F2F) mode to techno-based independent mode. This provides basic focus on developing the potentials and creativity of the learners in the best possible ways. Providing equal access to education, guaranteeing equity and justice, and ensuring timely delivery of the need-based educational contents, in engaging the learners through a carefully planned pedagogical support with the latest online/blended learning technologies. Technology could be seen as the catalyst for change as well as the solution for establishing the democratic principle of education as a whole. Following the outbreak of the Covid-19 pandemic, there began a renewed interest on the role and utility of online and digital learning at the time of a crisis across the whole world. The different experiments with collaborative learning, constructive learning, cooperative learning and transformative learning (TL) have shown that by adopting accessible, flexible and affordable technologies in education and by integrating in person and online activities while framing the learning objectives and assessing the expected learning outcomes of the learners, newer and effective ways of learning experiences can be visualized. And, when our society faces a crisis like a pandemic, war or any kind of natural disaster, such ideas of education might significantly help. For example, Baytiyeh (2018) discussed the impact of seismic events like earthquakes on educational services, while asserting the crucial role played by ICTs in delivering education even during temporary closure of educational institutions following a natural disaster like COVID-19.

Specifically, some studies have dealt with the perceptions of the faculty and students on the use of online learning at the time of the pandemic. Davis et al. (2020), for example, mentioned about the utility of using TL as a framework at the individual level by five faculty members teaching English courses at Duke Kunshan University (DKU), based in China. The results revealed that through TL, they were able to get rid of the negative effects, minimise anxiety and alleviate much of the academic and mental pressure caused by the pandemic. Peake and Reynolds (2020) conducted a study among the staff and students of the University of Bordeaux during the pandemic. The result showed that the virtual language centre of the university was established to ensure that students benefit from social media that would direct them to useful resources and to create an online virtual community to keep communication open among all those who had been involved. While referring to the Covid-19 pandemic as the greatest challenge to face to face teaching method, the education systems across the world have currently faced, Daniel (2020) mentioned how several governments have ordered institutions to switch, almost overnight, from F2F to online teaching and virtual education for the learners. Sir John also offered some pragmatic guidance to the teachers, institutional heads and state officials who should be able to address the educational concerns of the present crisis and thereby frame timely guidelines to cover issues like providing education that would meet students' needs at different stages of their academic lives, make room for flexible approaches to remote learning, renewed focus on curricula development, assessment, etc. Assuming the possibility of future recurrence of Covid-19, he urged all educational institutions, educators/teachers and students to continuously explore flexible ways to repair the damage already caused by the coronavirus by the use of technology in the classrooms.

Against these unprecedented contexts, blended learning can be a better alternative teaching method to be adopted during the COVID-19 crisis where teachers in Nigeria can use affordable, accessible and cost-effective technology in education irrespective of any socioeconomic discrimination. Teachers can undertake Facebook Live classes, resorting to Google classroom, uploading contents on YouTube, teaching through WhatsApp and meeting apps like Zoom, Cisco WebEx or Google Meet as an emergent response to the Covid-19 crisis.

The conventional blended learning model refers to teaching and learning conducted via a combination of face-to-face classroom learning and technology-based online learning approaches (Oliver and Trigwell, 2005; Graham, 2016). It combines the traditional face-to-face teaching with online teaching methods to enhance and extend the learning opportunities for students beyond the classroom learning. The online teaching, itself could be either synchronous or asynchronous or a combination of the two. For education during and post COVID-19 era, the blended learning model is ideally placed to address many challenges caused by the COVID-19 pandemic. However, if social distancing measures continue to be in place the face-to-face teaching element of this blended pedagogy may well acquire a new form in the interim leading to what we refer to as blended online pedagogy. The blended online pedagogy will combine face-to-face synchronous learning (which may be facilitated by technologies such as (Zoom, Google chat, etc.) with asynchronous learning to offer opportunities for cognitive participation which allows students to process and reflect on the learning.

The Concept of Blended Learning

This is an educational process that combines online digital medial with traditional classroom method. Blended learning is synonymous with the following terms: hybrid learning, technology-mediated instruction, web-enhanced instruction and mixed mode instruction (Martyn, 2003). This blended learning comprised also personalized learning, differentiated instruction, integrated instruction, flipped classroom and e-learning. It combines factors like online digital media with traditional classroom setting methods of teaching. In this classroom setting, the students and the teacher stay together in the class and interact with each other. During the process of interaction, the blended learning system is used by combining face-to face instruction with computer mediated instruction, (Bonk and Graham, 2006). In other words, blended learning has no definite definition. It is a mixture of various learning strategies that make up multiple teaching models that take place in a learning environment. A learning environment could be addressed as a place that includes communication media to interact with students (Gagne, 1970). The advent of technological explosion has given rise to proliferation of technological inputs into the global system. As higher institutions seek a way for effective interaction with a larger number of students, the availability of the internet and web technologies provided the answer – through

online and distributed systems (CarrChelman, 2006, Dempsey & Von Eck, 2007). The blended learning is a very innovative learning process that combines both online and in person learning experiences when a teacher teaches the students. The implication of this learning strategy is that a student might attend a class taught by a teacher in a traditional classroom setting and at the same time acquire online learning experience outside the classroom. In effect, the blended learning experience would offer the students the opportunity to be balanced in their learning experiences. The blended learning has forms which can come in various shapes and categories according to individual desires as would be seen below:

Forms of Blended Learning Strategies

Martyn, Margie (2003) outlined the distinctive learning forms as:

- Online instruction: This process involves the delivering of instruction to students via an online approach with an occasional face-to-face interaction of the teacher with the students. Here the students have the opportunity to interact with the teacher as if they are in constructivist class section.
- Rotation: In this setting strategy, the students move from self-set time period of independent online study to face-to-face (F2F) meeting and interaction with the teacher in the classroom environment. Here the time schedule is fixed but could be made flexible according to prevailing circumstances.
- Personalized blend structure: At times, the teacher designs a face-to-face encounter with the students anywhere, anytime as learning options might crop up. This is as a result of time and space constraints – because learning is constant but time changes.
- Flex: Most of the lesson content is delivered online. In the process, the teacher would be there to give the needed guidance and support to the students as they work in small-group settings solving problems.
- Online laboratory: In this laboratory format, the instruction is delivered online to students who are present in the specified laboratory. The online teacher delivers the lecture and the paraprofessional staff supervises online.
- Self-bend approach: Students generally exert efforts to maximize their understanding of lesson contents by supplementary their online learning with the traditional course work. It makes the students have added advantage in their studies.
- Face-to-face (F2F): The teacher comes face-to-face with the students and delivers his lessons and support the teaching with technological support like the computer or other devices to enhance effective learning.

Blended Learning Affordances

- The students have the opportunity to learn more new things due to the introduction of different learning environments, online and face-to-face encounter.
- Students are motivated as they learn new skills for their projects and other learning tasks.
- Students learn the process of interacting with one another. They have the opportunity to voice out their opinions and share others opinions for effective learning to take place.
- Time efficiency is inherent in blended learning. The students could be in a better position to ask questions above the lesson content and equally respond to questions without time limitation. It is more effective on the part of the students when they are supported online after F2F encounter with the teacher (Ganham and Kaleta, 2002).
- Reinforcement in the learning process enables the students to work harder. The combination of F2F encounter with the online support gives the students the opportunity to conduct more research, do group work, quizzes and projects (Johnson, 2008; Kreijns & Jochems, 2003).
- More resource availability is an added advantage. Here the students using online environment supported by F2F environment are helped to enhance discussion and peer interaction. In other words, the opportunity to encourage multiple avenues in a learning process increases the learning potentials of students in both environments (Woods & Hopper, 2004).
- The interactions processes in online and F2F environments, Moore (1989) and Anderson (2003) enhance strong interaction which would increase opportunities for different interaction processes to

take place. Therefore, the combined online and F2F delivery methods of teaching and learning has the ability to offer the students the opportunity to utilize different media available to them to support their learning in any of the environments such as in synchronous and asynchronous discussion moments.

- The blended classroom environment gives the teacher the opportunity to prepare and deliver lectures in more flexible way than in a traditional classroom setting.
- Blended classroom teaching is cost effective as more students are taught more effectively at lower cost to the school.
- Blended learning collects and stores data, customize instruction, assess students' records and provide information, parents details and that of the teachers
- Talented students can use educational technology to achieve greater feat in technology than their counter parts.
- Blended learning gives the students the sense of ownership over the learning process and this sense of ownership propels them to greater heights.
- Blended learning provides the students with real life skills that can transform them to acquire some innovative skills for national productivity and greatness in life.

Nevertheless, there are disadvantages in this blended learning affordances, the above benefits notwithstanding. There are equally many drawbacks.

Drawbacks of Blended Learning

- Heavy workload: The combination of workloads in the two environments makes the course load heavier than available in a single environment load. Consequently, the students in the learning process have no time to most of their other needs.
- Assignments and readings in the two environments are overwhelming. Also some students experience difficulties in online environments such as in uploading documents, responding to discussion contents without teacher's guidance. In all, the students battle a lot to balance the workload and be able to meet up with good academic performance.
- The problem associated with cultural context and language in use: In a class for instance, the students could come from different backgrounds including different countries with different languages. Some may not be fluent in English Language but the language of instruction in university is English. The language could be a barrier to non-native speakers of English language and for those students with deficient writing skills (Palloff and Pratt, 2007). This could make them drawback from the activities and the team work experience which they are supposed to acquire among the group members.
- The students feel that the interdependence of the two environments is a barrier to them in that success in one environment is as a result of the success in the other. They see F2F activities bound to online activities which make their participation and learning difficult.
- In-person supervision: Without in-person supervision, students could spend most of the useful time operating social media, charting with friends instead of engaging in their school work.
- How prepared are teachers trained for blended classroom learning? The question that comes to mind is how far are teachers trained in technological facilities to enable them perfect in blended learning? To achieve this feat, teachers must be given adequate training on how to teach the students in blended learning context. Adequate technological approach is required but if the teacher cannot operate the facilities well, the blended learning would be ineffective.
- How are the infrastructures? Are they appropriate to operate technological gadgets in the classroom? Without infrastructural facilities, it would be very difficult to operate blended classroom. • High maintenance cost: The cost of acquiring modern technological gadgets is very high. This could be one of the reasons why most universities in developing nations suffer from inadequacy of technological facilities. Consequently, such universities still rely on traditional approach to teaching and learning.
- Digital literate lecturers who can conveniently integrate technology into teaching with face-to-face approach are not easy to come by in developing nations. Anekwe (2016) made an observation that

technological facilities like social media devices are still used to a low extent in institutions of learning in developing nations.

Strategies for Improvement

Blended Learning should be improved in various ways as outlined below:

- The government should increase the funding of the universities in order to select the highly qualified lecturers to handle blended classroom education.
- The quality and availability of teaching materials technical and otherwise should be made available to the competent lecturers.
- The lecturers should be very conversant with the quality and content of the instruction and curriculum.
- The infrastructure must be made adequate for effective learning such as classrooms, libraries, laboratories and other physical facility investments.
- There should be enough modern teaching techniques such as those available to the digital natives which the lecturer should employ to stimulate both digital natives and digital immigrants in the learning process.
- Availability of specialized lecturers to handle some special issues online and F2F encounter.
- Consideration should be given to the workload given to students by the lecturers both in online and face-to-face encounter.
- Modern management and administrative techniques should be constantly applied to monitor and evaluate performance of both lecturers and students.
- The lecturers should use the lecture language in such a way that students from other learning environments should be carried along in the learning process.
- Adequate supervision should be instituted to make sure that students do not waste their precious time in operating social media, charting and watching films in the social media. When the above factors are taken into consideration, the learning affordances would be fortified and the drawbacks would be reduced.

Impacts of Covid-19 on TVET Systems in West Africa

The COVID-19 pandemic has largely affected education, prompting training providers to search for rapid and feasible solutions to deliver learning content. In the months of April and May 2020, the ILO, in partnership with UNESCO and the World Bank, conducted a qualitative worldwide survey with TVET providers and policy-makers on addressing this pandemic. The purpose of this survey was to gather good practices and share knowledge to help countries around the world to address the current situation. It targeted providers of initial and continuing technical and vocational education and training (TVET), policy makers and social partners. The survey counted with the participation of 11 West African countries.

In the vast majority of countries, TVET schools and training centres are closed as a measure to counter the COVID-19 pandemic. Work-based learning, apprenticeship training and internships are affected by the closure of workplaces. The few businesses that remained opened allow only essential staff to work at their facilities. In a few countries where training centres remained opened, trainers and students follow the WHO's recommendations on infection prevention and control. However, training attendance has been largely affected due to government restrictions to public transportation. In addition to this, uncertainty contributed to demotivation among students. In some cases, students that live at nearby school compounds moved back to join their families. Certifying exams and assessments were postponed, but not yet cancelled for this year. Students, and especially those completing their graduation in the current year, fear of not being able to complete training and of impacts on their entry in the labour market. Trainers face the challenges of readapting training content to environments where interactions with students are largely reduced and to an academic schedule that has been disrupted.

Online learning and other solutions to deliver training, including TV, radio and mobile applications were adopted in a number of countries. The implemented solutions are mainly based on asynchronous learning, and rely on environments prepared as quick solutions for the download of training materials. Although they do not support instant interactions among students and with instructors, they favour self-paced learning. The solutions

also do not involve components for practice-based learning, which are of particular importance in competence-based training.

The implementation distance training solutions was a response to the disruption in training due to the pandemic. Some countries have existing policies on the digital economy, and strategies for distance education, however, the adoption of distance training solutions followed the closure of education and training establishments as part of country level emergency responses to COVID-19 pandemic. In most countries, online training was rarely or never used before.

Challenges and Opportunities to the Expansion of Blended Learning in Tvet during Covid-19 Era

The absence of ICT infrastructures, the lack of funding for the acquisition of personal computers and of basic computer literacy training were mentioned as limitations to the diffusion of online training among a larger number of students. These were also cited as the main reasons for not using online learning environments as a regular option for training delivery before the pandemic. Training of trainers to develop online training environments is limited and supporting manuals are not available. Very few respondents mentioned that their TVET institutions provided training to trainers on the use of collaborative platforms, the creation and management of online forums, and on recording instructional videos. There is recognition of the importance of exploring new solutions for distance training delivery. The creation of online learning environments and encouraging the use of videoconference among students and trainers are the main envisaged options to promote the expansion of online training. They are followed by the development of blogs, forums and videos, with the support of existing tools for communications and storage available over the internet under the terms of free use. The expansion of online training should also take into account solutions to address skills shortages in sectors or occupations affected by the COVID-19 pandemic, such as in health care, and to enable reskilling and upskilling of the labour force, and particularly those who lost or are at risk of losing their jobs. There are also opportunities to expand distance training to migrants and to unemployed youth and young workers in the informal sector.

ILO, UNESCO and World Bank (2020), summarizes the challenges and opportunities posed COVID 19 in TVET as follows:

The scale of the COVID-19 disruption to technical and vocational education and training (TVET) has been truly astounding.

TVET would particularly suffer from school closures as imparting and assessing practical skills is so central for TVET and so hard to do remotely. A survey conducted by the ILO, UNESCO, and World Bank in April and May 2020 collected data from over 1,300 respondents in 126 countries, mostly representing TVET providers. The vast majority (90%) of respondents reported complete closure of TVET centers in their country and virtually all respondents (98%) reported disruption of work-based learning. Assessment activities were also halted, with over three-quarters of respondents reporting postponement of certification exams. This is very concerning, as disrupted learning can lead to discouragement and dropout with long-term social and economic consequences. Without remediation measures, this can create a "COVID-19 generation" of workers with lower earnings and lower quality jobs over their lifetime.

Covid-19 outbreak triggered tremendous efforts to promote learning continuity and accelerated the uptake of innovative approaches.

After stopping face-to-face learning, many TVET providers scrambled to transition to remote learning modalities, identifying solutions and partners to facilitate this switch, and establishing support for students and teachers. The responding TVET providers in most countries did not have a pre-existing crisis preparedness strategy, and few engaged in distance learning before. Even so, around two thirds of providers participating in the survey delivered fully remote training by the time of the survey. The pandemic forced even providers that had been slow in exploiting the opportunities offered by technology to quickly adapt, often supported by partnerships between teachers and managers of TVET institutions and schools, telecommunication operators, technology providers, governments, and parents.

The extent to which remote learning is complicated by TVET's emphasis on practical skills also differs greatly between countries and programs.

TVET's strong emphasis on acquiring occupation-specific practical skills creates additional challenges. Practical skills are often acquired through learning-by-doing, which occurs in school-based workshops and laboratories or through gaining hands-on experience in work environments. Remote learning approaches are a weak substitute for practical exercises, when these exercises require the use of equipment or materials that are usually not found inside the home, except where such exercise can be simulated remotely via, for example, virtual or augmented reality experiences. Programs that will struggle most are those that depend heavily on learning-by-doing, and where this "doing" is not usually done via the computer. Programs that can switch to remote learning more easily are those with a stronger emphasis on academic subjects or on work-specific skills that do not require manual activities, and those that rely heavily on computer usage. For example, a post-secondary program on cyber-security will be relatively easy to move online since it already relies heavily on computer use. A training program on financial management or marketing does not require non-digital equipment and could therefore also be moved online. On the other hand, a secondary training program on automobile mechanics requires substantial hands-on practice and will be much more difficult to provide remotely. Again, whether a switch to remote learning can materialize at all also depends substantially on whether there is connectivity and a platform.

The extent to which remote learning can effectively support learners is likely to be lowest for low-income countries and vulnerable students.

Remote learning can take place online and offline, with the support of computers, tablets, phones, radio and television, or printed material. Across countries, those with broad-based connectivity among teachers and students, existing platforms for remote learning, and a population with well-developed digital skills will be better able to adjust than those where these prerequisites are not in place. Within countries, already disadvantaged communities are less likely to benefit from remote learning, both due to technical limitations in connectivity, equipment or digital skills, and due to other factors, such as limited learning structure and guidance that can be provided within the household and generally weaker mechanisms to cope with the socio-economic impact of the pandemic. Some students, particularly women and girls, might face additional constraints in terms of time availability due to competing responsibilities, such as caring for children and elderly family members and other household duties.

Practical training was severely disrupted nearly everywhere, despite some positive exceptions.

Most providers were unable to deliver or assess practical skills training, so instead resorted to focusing their remote training on theoretical coursework, hoping to resume practical skills training in the future. Others managed to find ways to focus on practical skills even during peak quarantine. In some instances, apprenticeships continued even when schools were closed. Respondents from Ecuador reported students carrying out practical tasks at home and sending videos and photos of completed work for evaluation by their teachers.

Successful responses were not evenly distributed, and the crisis emphasized pre-existing gaps in accessing learning opportunities.

While three out of four TVET provider respondents in high-income and upper-middle-income countries reported providing fully remote training, this was possible only for less than half of TVET providers from lower-middle-income countries and less than one in five in low-income countries. The dominance of high-tech solutions, such as video conferences and virtual learning environments, could also have exacerbated digital divides within countries. Evidence from a remote learning program in India suggests that students from lower-income households had limited access and difficulties engaging with remote learning sessions due to internet charges, device quality and electricity outages. This demonstrates the value of multi-channel (or multi-modal) delivery approaches in supporting continued access to learning for all, as was done for TVET in Afghanistan during the COVID-19 crisis.

2020 was a year of intensive creativity. For example, as discussed in a recent webinar, the government of Mongolia in 2020 experimented with training interns on-site; created a digital curriculum database; and developed a digital monitoring and information system. It is now concentrating on improving the digital skills of learners and teaching staff and contemplates shifting to more flexible short courses to better respond to employers' needs. In Brazil, the network for industrial training (SENAI) significantly expanded its virtual offer and capacity in 2020. In addition to expanding virtual learning options for its students, it created a platform to support SENAI pedagogic staff in developing and delivering content remotely, and a digital innovation hub where firms can articulate real-world challenges to be addressed by SENAI students.

TVET systems need to address short-term implications of the pandemic and persistent structural problems.

Responding to the pandemic involves preventing and remediating dropout and reversing learning losses as well as reskilling workers to strengthen their employability in a labor market that may have structurally changed. At the same time, many TVET systems worldwide still need to address important structural gaps that persistently weakened their performance even before the pandemic.

The pandemic exposed weaknesses in TVET institutions and systems, but the scale of innovation and experimentation also showed that rapid change is possible.

As economies, schools and training centers reopen, there is an urgent need for skills development mechanisms that are tailored both to students' individual needs and to the changing skill needs on the labor market, with digital skills, socioemotional skills, higher-order cognitive skills, and adaptability being valued more than ever. This opens a window of opportunity as stakeholders realize the potential and need for structural reforms of TVET for better skills development and better jobs.

The Proposed Blended Learning Model for Tvet During Covid-19 Era

Khan, in Singh (2003) as cited by (Akpan, 2015), proposed a blended learning model. This can also be suitable for TVET during COVID-19 in Nigeria. The framework has eight dimensions: institutional, pedagogical, technological, interface design, evaluation, management, resource support, and ethical (See Figure 1). Each dimension in the framework represents a category of issues that need to be addressed in order to help organize thinking, and ensure that the resulting learning program creates a meaningful learning experience in TVET.

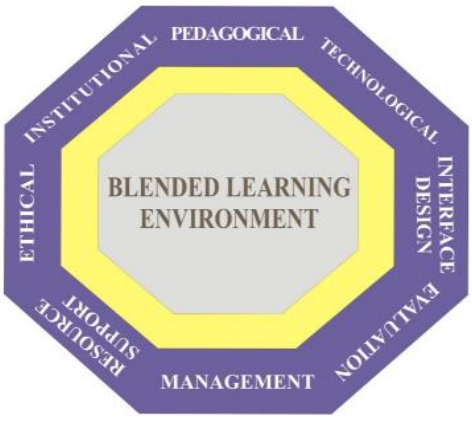

Figure 1: Khan's Octagonal Blended Learning Model

- **Technological**: This examines the availability, accessibility and usability of the LMS to enable the synchronicity of blended learning. The technological component also requires the services of technical experts to support the system.
- **Pedagogical**: This is concerned with the combination and selection of the learning contents to be delivered online and to be delivered offline (face-to-face). It also analyzes the learners' learning style, objective of the contents, and evaluates students learning outcomes.

- **Management**: This component deals with issues related to quality control, availability of technical experts, upgrading of infrastructures for multiple deliveries and improvement facilities.
- **Interface design**: This addresses issues related to the user interface of each element in the blended learning environment.
- **Evaluation**: This assesses the capability and effectiveness of the blended learning environment, its functionality and improvements of a specific LMS.
- **Resource support**: This deals with making different type of interactive resources (online and offline) available for learners.
- **Ethical**: This identifies the ethical issues that need to be addressed when developing a blended learning program, such as equal opportunity, cultural, diversity, and nationality.

Conclusion

The advent of information and communication technologies has made teaching and learning of TVET a dynamic process. Instruction is being delivered by blended learning approach at different institutions of learning through the use of LMS. This study has outlined the concept of the blended learning approach from the perspective of teaching and learning of TVET during the COVID-19 era. Moreover, this study proposes Khan's octagonal model as a model that can foster best practices in blended learning during the pandemic era. The study can be considered as a proactive prospect for TVET aiming to adopt a blended learning approach, in order to harness the diverse learning opportunities that technology can provide and also enable educators to select a suitable blended learning environment for teaching and learning of TVET during the pandemic.

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