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Maintaining Academic Standard and Utilizing Online Teaching in Vocational Technical Education: The Nigerian Perspective

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Abstract
The construct of this paper is to dissect the interplay between teachers, their practice, and their teaching context through reconnoiter in relationships between conceptions of teaching, teaching context, and enacted practice, and the classification of pedagogy as teacher-centred or student-centred. This discourse is then situated within a wholly online vocational technical education teaching context bringing Nigeria into perspective. The idea is that the teacher is central to the introduction and use of online pedagogical mode, and any discourse on online teaching that excluded the teacher's nature and teaching characteristics would be a nirvana. The paper also articulates the classification of online or information, communication, technology teaching facilities and decried the absence of concise national policy and inadequate online teaching resources, because entrenching quality or maintaining standard is possible when all rightful provisions for the functionality of online teaching has been made, as something cannot be built on nothing.

Key words: Online teaching, vocational technical education, Teachers, information, communication technology, Nigeria

Introduction
The onset of the novel corona virus made everything from world economies to social activities devastated and necessitating the enactment of many protocols and regulations targeted at its containment. To this end, precautionary measures such as maintaining social distancing, following medically instructed quarantine process, and embracing hygiene and sanitation were enforced. The Pandemic deeply affected global economy and shaken up the education sector. The aftermath of COVID-19 crisis, came a pedagogical shift from traditional method of teaching-learning in classroom to the online education using e-conferencing tools such as Zoom, Google Meet and Microsoft teams, from face-to-face to virtual and from seminars to webinars. Previously, e-learning, distance education and correspondence courses were popularly considered as the part of non-formal education, but presently, it is gradually replacing the formal education system if the circumstances enduringly persist over the time. As you would have observed, apart from the Colleges of Education (COE) and Polytechnics, most Nigerian universities are either operating on partial or full virtual academic activities.

Some of the most popular online communication platforms that would change the destination and direction of the whole education system across the world in post-COVID-19 circumstances are Start.me, Neo, Classtime, Classwize, *Ted-Ed*, Coursera, Google Classroom, Bakpax, Pronto, Skillshare, ClassDojo, Edmodo, Blackboard Learn, Parlay, Docebo, Feedback Fruits, Udemy, WeVideo, WizIQ, Flipgrid, Codeacademy, Gynzy, Adobe Captivate, Seesaw, Edx, GoGuardian, Elucidat, Kami, Pluralsight, G Suite, Otus, Articulate 360, Floop, Future Learn, Hapara, Shift, Lectora Inspire, Kialo Edu, Buncee, LanSchool and many more. Several arguments are associated with e-learning. Accessibility, affordability, flexibility, learning pedagogy, life-long learning, and policy are some of the arguments related to online pedagogy. It is said that online mode of learning is easily accessible and can even reach to rural and remote areas. It is a relatively cheaper mode of education in terms of the lower cost of transportation, accommodation, and the overall cost of institution-based learning. Flexibility is another interesting aspect of online learning; a learner can schedule or plan their time for completion of courses available online. Combining face-to-face lectures with technology gives rise to blended learning and flipped classrooms; this type of learning environment can increase the learning potential of the students. Students can learn anytime and anywhere, thereby developing new skills in the process leading to life-long learning. The government also recognizes the increasing

importance of online learning in this dynamic world. The severe explosion of Corona Virus disease makes online learning serves as a panacea in the time of crisis.

The online teaching strategies have been an effective area of discussion for researchers. As the general view of higher education changes, the incorporating of technological materials into educational structures has become more essential. Smith and Ferguson, (2002) investigated the differences between online teaching and classroom instruction. The sample included 21 teachers who taught in both the traditional classrooms and online teaching formats. According to the authors, most teachers were trained in traditional teaching strategies and lack the experience and training in online teaching systems. Menchaca and Bekele (2008) conducted a qualitative study on learner and instructor position in online teaching module. They stressed that significant differences exist between traditional classroom teaching and online teaching. Menchaca and Bekele determined five factors to develop a framework for an effective online learning, which include human factors, course factors, leadership factors, technology factors, and pedagogic factors. According to them, these factors are essential to provide an effective and challenging environment that supports an interactive teaching in an online environment. Wojnar (2002) performed a study on the best practice model of online teaching and learning. The scholar conducted a qualitative case study that included a sample of six students. In this study, Wojnar stressed that many online courses do not have a pedagogical approach. An important finding of his study is that pedagogical design is an essential factor in developing an effective online learning. Pulling together and drawing from all the studies, especially on Menchaca and Bekele five factors of Human, Course, Leadership, Technology, and Pedagogy, the teacher is obviously very essential for an effective online learning. Also, critical is how to maintain standards or entrench quality for the effective online teaching of Vocational Technical Education. To understand pedagogy in any teaching context, Jensen, Price, and Roxå (2019) have recommended that it is important to understand the interplay between teachers, their practice, and their teaching context. The rest of the paper is structured as follows: Apart from the introduction which provides a general background, in the next section, key concepts relevant to this paper are introduced. These include relationships between conceptions of teaching, teaching context, and enacted practice, and the classification of pedagogy as teacher-centred or student-centred. Then, this paper situates the discourse within a wholly online vocational technical education teaching context bringing Nigeria into perspective. ICT is classified in section four to carve a niche in the motivation and commitment of learners, facilitating the acquisition of basic skills and enhancing teacher training, which lay the path for the discourse on how to maintain standard in online teaching in section five. The conclusion then summarizes key discourse.

The Teacher, Their Practice and Teaching Context:

Relationship between Teaching Conceptions, Teaching Context and Enacted Practice within the online Teaching Nexus:

It has been reported that teachers generally teach how they themselves were taught (Ellis & Hafner, 2003), and until recently, most of their education experience will have been in face-to-face classroom contexts (Brinthaupt, Fisher, Gardner, Raffo, & Woodard, 2011). However, online education is growing significantly across sectors (Sun & Chen, 2016), and there are reports that teachers are challenged when their familiar face-to-face teaching strategies are not able to be effectively enacted online (Banas & Velez-Solic, 2013). In essence, experienced teachers once again become novices during the shift to online education (Redmond, 2011), and online education is a teaching context that is understood to challenge existing conceptions about the teaching role (Kilgour, Reynaud, Northcote, McLoughlin, & Gosselin, 2019). As teachers navigate from classroom to online teaching contexts, they re-conceptualize how to connect their teacher self with the different fissure and limitations of teaching online (Baran, 2011). This includes a re-conceptualization of their beliefs about what represents ‘good’ pedagogy in the different teaching context that is online education (Rodrigues Almeida, Figueiredo, & Lopes, 2019).

Teacher’s beliefs about pedagogy are known as their conception of teaching. Conceptions of teaching represent the way a teacher is inclined to teach, or would prefer to teach, within a particular teaching context (Clark & Peterson, 1986; Samuelowicz, 1999). This is important because conceptions of teaching have long been known to directly affect enacted practice (Conrad, 2012) and the relationships between these two parts of pedagogy have been an important element of education research for three decades (Harshman & Stains, 2017). Enacted practice is different from conceptions of teaching in that enacted practice describes the teaching actions and interactions undertaken by the teacher (Gibbons, Villafañe, Stains, Murphy, & Raker, 2018; Westbrook et al., 2013). Importantly, enacted practice has been found to not always align with conceptions of teaching (Doyle, Seery, Canty, & Buckley, 2019). This is because enacted practice is also affected by the perceived affordances or limitations of each teaching context (Clark & Peterson, 1986). This means that the real or perceived affordances, limitations, or needs of a particular

teaching context can cause teachers to shift their practice toward or away from their ideal (Eley, 2006; Samuelowicz & Bain, 1992). For example, Shi, Delahunty, and Gao (2018) found that large class sizes, an exam-driven teaching context, as well as the teacher's own confidence, experience, and knowledge, hindered the enactment of some idealized pedagogies. So important are the relationships between conceptions of teaching, teaching context, and enacted practice, that Kennedy (2010) recommended no understanding of pedagogy in any context can therefore be developed without considering all three parts. Notably, both conceptions of teaching and enacted practice can be classified as teacher-centred or student-centred (Eley, 2006). Since the seminal work of Samuelowicz and Bain (1992), the nature of teacher-centred and student-centred pedagogy has been much researched and debated for both face-to-face and online teaching contexts. However, in summary, within face-to-face classrooms, teacher-centred pedagogy has been described as teachers transmitting information, which is often curriculum-bound, to students in structured ways and this may include handouts and giving examples from the teacher's own experience (Kember & Kwan, 2000). In contrast, student-centred pedagogy has been described as shifting the teacher role from instructor to facilitator (Regan et al., 2012) whereby students discover and create knowledge (Kember, 1997). Student-centred pedagogy is reportedly a complex undertaking (Sadler, 2012) and should not to be mistaken for students being expected to teach themselves; rather, it is a "balance between teacher- and student-directed learning" (Gordon, 2016). Moving to online education, González (2009) found that the differences between teacher-centred and student-centred online pedagogy can be seen in how learning management system (LMS) tools are utilized by teachers. They suggested that a feature of teacher-centred pedagogy online is providing structured learning materials to students for independent study. In contrast, student-centred online pedagogy focuses on providing students with communication spaces and opportunities to build knowledge. A defining feature of student-centred online pedagogy is reportedly the teacher facilitating collaboration between students for the purpose of knowledge discovery and creation (González, 2009, 2010, 2012). It has been found that teachers with teacher-centred beliefs will normally choose technological tools that let them teach that way, and in contrast, teachers with student-centred beliefs will usually choose tools that support their enactment of student-centred practices (Tondeur, van Braak, Ertmer, & Ottenbreit-Leftwich, 2017). Importantly, González (2013) found that teachers who align with student-centred conceptions of teaching but who perceive their online teaching context to be constrained will shift their practice to be more teacher-centred. In this way, enacted practice can represent a compromise between teaching conceptions and teaching context (Kennedy, 2010; Norton, Richardson, Hartley, Newstead, & Mayes, 2005). Critically, Lowenthal, Nyland, Jung, Dunlap, and Kepka (2019) found that an important factor in the effect of teaching context on practice is the teacher's own perceptions about the affordance or limitation of that teaching context. In this way, the relationships between conceptions of teaching, teaching context, and enacted practice remain dynamic. Student-centred pedagogies are considered best-practice online, which according to Sun and Chen (2016), includes encouraging students to discuss learning content with each other in relation to their own experiences. However, not all students value such discussions, and some perceive student-student communication does not contribute to their learning (Jaggars & Xu, 2013). Furthermore, the nature of student-centred pedagogy continues to have inconsistent interpretations and understandings (Trinidad, 2019). Therefore, understanding what a teacher conceives as student-centred pedagogy is important. As described next, this paper aligns the discourse with the vocational technical education elements.

Vocational -Technical Education Online Teaching Context

Generally, the vocational and technical education sector is understood to be fundamentally different from other post-secondary teaching contexts (Fowler, 2017; FRN, 2004). Vocational-Technical Education courses are usually offered at post-secondary level under two categories in our training institutions. Firstly, the Nigerian Colleges of Education and Polytechnic, leading to the award of NCE, and OND/HND. Secondly, the University, leading to the award of bachelor's degree. Technical Colleges are post-primary in design and lead to post-primary certificates such as city and guild, West African School Certificate, Technical or certificate of proficiency from the college itself for students who could not obtain any of the aforementioned certificates. VTE is governed by principles of student competence globally (Harris & Hodge, 2009) and the very nature of this competency-based framework reportedly encourages teacher-centred pedagogy (Brennan, McFadden, & Law, 2001). This is because the VTE curriculum is regulated for quality through audits (Accreditation and Supervision by quality assurance unit) that require teachers to prove they have conveyed occupation-specific, curriculum-bound skills (Black & Reich, 2010). Importantly, transmission of skill is prioritized over development of underpinning knowledge within VTE (Wheelahan, 2009). Therefore, direct-instruction and transmission of information are encouraged pedagogies within VTE, and Griffin and Mihelic (2019) have anticipated that this may introduce unique tensions when VTE teachers are asked to teach online. With respect to online teaching facilities, virtual laboratories could be utilized to teach vocational courses (Ray & Srivastava, 2020). Virtual laboratories allow students to simulate experiments or practical related to their

courses online (Diaz & Walsh, 2020; Vasiliadou, 2020). Such tools have been deployed for simulation and data visualization for many years (Jain, Chakraborty, & Chakraverty, 2018), and their use have now become widespread, unfortunately the enabling ICT facilities are either not available or very scarce in our institutions. In institutions that boast of installing internet or online teaching facilities, the facilities can best be described as 'fledging'. In some remote institutions, the internet broadband coverage is very weak and subscribed bandwidth are too low to sustain the uploading of graphic contents of training involved in vocational education. Worst still, most Colleges of Education in Nigeria Lack Learning Management System (LMS) tools. The websites of many Colleges are designed for advertisement and revenue collection. Even at that, technically, the landing and navigating content are very poor. More than half of all occupation qualifications need to be at VTE rather than university level. But the sector is bedeviled by numerous problems, most of which have been documented by Uwaifo and Uwaifo (2009), Uwaifo, (2009) and Okoye and Arimonu (2016). However, for VTE to continue meeting its responsibilities to skill and up-skill current and future workers, it must as a matter of urgency seek to surmount subsisting problems and expand its online education offerings. But we know that teaching methods do not automatically improve due to the ICT implementation in the classroom. It is necessary for ICT to be embedded in the educational process in a careful, balanced way, the benefits of ICT being achieved especially when attention is paid to the entire educational environment and not only to technology as a medium for the transmission of information or skill.

Classifying ICT tools for VTE Training

Improving the quality of vocational-technical education and teachers' output are major problems at a time of expansion of education. Information and Communication Technology can facilitate the process through various ways which include increasing the motivation and commitment of learners, facilitating the acquisition of basic skills, and enhancing teacher training. In terms of students' motivation for learning, the different technologies that combine text, sound, color, moving images can be used to provide authentic and interesting materials designed to attract and engage the learner actively in the learning process. To achieve the development of teachers' competences, the introduction of Information and Communication Technology in the educational activity must go through the following stages. Firstly, substitution stage which connotes accidental use of new technologies, along with the use of traditional teaching methods. Secondly, transition stage where new technologies are being used at the same time as traditional methods; and finally, transformation stage when new technologies are used instead of traditional methods (Mocanu and Deaconu, 2017). The ICT tools that can be used in Vocational education are many and, in the literature, there are different ways of classifying them. This paper adopts the simple and easy to adapt classification by Vandenbroucke,- (2014) in a work on Information Technology and Communications Technology (ICT) Integration in the National Curriculum - Informatics Disciplines. According to the author, modern technology tools can be divided into the following:

Hardware tools - represents the universal or specialized digital equipment used in carrying out the education process. They are used as a digital text provider at the early times; hardware tools now offer multiple communications, accessibility, and multimedia facilities. Hardware tools can be categorized as follows:

- Presentation equipment - are those devices that offer the possibility of interactive and passive visual and audio perception of digital information for one or more users. For example, video monitors, interactive displays, video projectors, projection screens.
- Storage equipment - are the tools (magnetic, optical, mixed) that allow safe storage of data on small, portable, high-capacity devices. For example, the application server, the data storage server, the communications server.
- Specialized equipment - are those devices used to capture images, video and audio sequences, such as scanners, cameras and digital video cameras.

Software tools - are represented by digital resources of various types, such as:

- ***Passive resources*** - These are different text documents, images, sound or video sequences, digital dictionaries on a data medium or in the Network that can be accessed by users. These are characterized by the fact that they are accessed through other specialized software (Google maps, Google Books, Wiki, Dexonline, Google Docs, etc.) without proper, well defined action.
- ***Standardized learning objects*** - are interactive programs designed to meet international standards, enabling users to perform practical tasks, solve different exercises or tests, etc. Learning objects can be passive models based on content transfer (models with sequential, hierarchical and network structure) and interactive models for interactive learning (models for unique users, universal models, and collaborative models).

- ***Simulation applications*** - are applications that allow users to observe and model phenomena or actions without actually getting involved in their deployment. Educational games are also included here. Example: Virtual Laboratory of Informatics and Information Technology and Communications
- ***Evaluation applications*** - are software products that enable the user to create different evaluation tests and to analyze, preserve and transmit the results of the evaluation to the learning management system. These applications allow the testing of knowledge and can be applied both independently and in a training environment. Examples: Insam platform, Infoarena, campion, TopCoder, "Evaluator OJI".
- ***Learning Management System (LMS)*** - are software applications that use in integrated databases to keep track of progress, learning efficiency, instructional content, and information on how to use it. The main purpose of an LMS is to ensure the process of increasing knowledge, developing new skills and abilities, and in some cases increasing labor productivity. Examples: NetSupport School, Platforma Oracle Academy, Platforma de e-learning Moodle, Live@Edu, W3Schools, Platforma IT Essentials, AeL etc.
- ***Learning content management system*** - are software applications for the development, management, and subsequent publication of educational resources (content) through LMS. An LCMS is a common medium in which content creators can develop, store, reuse, manage and deliver learning content through a central repository. Examples: Moodle, Google Docs, Wiki, ZoomIT etc.

Communication tools - are represented by the hardware and software tools used to carry out the synchronous and asynchronous communication process. The software tools used for synchronous communication are continually diversifying, the most popular being Google Talk, Yahoo Messenger, Skype, videoconferencing, chat etc. The most commonly used tools for asynchronous communication are e-mail, blog, forum, discussion group, storage for documents of various formats (image, text, audio, video) like SlideShare, YouTube, Issuu, etc. The hardware tools used for communication are those that allow the physical transmission of information such as the Internet, communication channels, data servers and network devices, etc. Romania Institute of Educational Sciences (2011) proposed another classification of the ICT tools used in education as:

1. **Collaboration tools:** Wiki pages, Blogs, Social bookmarking tools, etc.
2. **Communication tools:** These are partitioned into two namely;
    - Asynchronous: Email, Discussion Forum, Virtual Library, Web Sites, etc.
    - Synchronous via Internet: Chat, Video conferencing, Skype, etc.
3. **Social networks**: Facebook, etc.
4. **Self-promotion tools:** CV Video, Personal Website, Prezi, etc.

Aduwa-Ogiegbaen and Iyamu (2005) observed that the use of ICT is not yet an integral part of teaching methodologies in Nigeria. Many teachers do not have the necessary skills to integrate ICT's in teaching process. They note further that the use of ICT is often made difficult by a series of related factors which include:

1. Insufficient number of computers, and software;
2. Slow internet access;
3. Poor ICT management, and
4. Poor training of teachers; ICT training received by teachers tends to focus mainly on the immediate practical or technological aspect such as the use of computer, word processing and the internet rather than how to introduce them into actual teaching.

Sixteen years after their observations were made the prevailing environment or conditions in our schools and institutions of higher learning with respect to ICT and online teaching and learning shows that their observations are still valid and subsisting, as there are no significant changes.

Entrenching Standards in Online Teaching of Vocational-Technical Education

The term standard is synonymous to approved quality. According to Urevbu (2015) Quality is a relative term. This is because quality is used in many different contexts and its meaning changes accordingly. Before the 1980's the quality of education was defined in relation to a number of different aspects of education which remained fairly constant over time. Six aspect of quality were identified in the educational literature (Urevbu, 2015). These were:

1. Quality as resource inputs: textbooks and instructional materials per student; teacher qualifications; teacher/students' ratio, etc.
2. Quality as outputs: academic achievement on test scores; personal income of school leavers; progression and pass rate, etc.
3. Quality as process: student/teacher interaction; level of learner participation; and engagement in learning.
4. Quality as content: inclusion of contemporary knowledge; coverage of the basics.

5. Quality as reputation: general public perception and historical image of schools.
6. Quality as values: influence on the overall development of the students.

In pursuit of quality or raising standard of education, in 19999, the UBE programme was launched. In August 2000, a National stakeholder Consultation on Education was convened in Abuja to identify the problems of the education system and proffer solution. Seven broad issues were documented namely:

1. Deficiency in the curriculum and its delivery;
2. Inadequate school infrastructure
3. Overcrowded classrooms
4. Poor motivation on the part of teachers;
5. Over-emphasis on examinations rather than skills development;
6. Inadequacies in financing; management, planning, statistics and monitoring;
7. Lack of evaluation in the education sector; and a lack of political will to tackle this systemic crisis.

A cursory look at the enumerated problems shows ICT in education is not given any attention required for a nation seeking to advance its educational system in a digital age. Suffice it to say that unlike other developing countries, Nigeria has no National policy for use of ICT in education sector. Smaller Countries such Romania, Angola etc. have long developed policies to enable productive use of ICT in their education sector.

Maintaining quality or standard in online teaching of VTE would encompass the following:

1. institutional and Programme accreditation;
2. internal (academic) quality assurance processes;
3. establishment of internal ICT policy

Institutional and Programme Accreditation

Accreditation is the process by which educational institution such as schools, post-secondary institutions, and other education providers meet, and maintain, minimum standards of quality and integrity regarding academics, administration, and related services. It is a voluntary process based on the principle of academic self-governance. Schools, post-secondary institutions, and programs (faculties) within institutions participate in accreditation. The National Universities Commission (NUC), National Colleges of Education Commission (NCCE) and National Board for Technical Education (NBTE) are the agencies that carry out accreditation for Universities, Colleges of Education (COE) and Polytechnics, respectively. It is advocated that the scope of accreditation should deliberately widen to cover online teaching and revolving facilities in lieu of the prevailing situations globally. However, the role and process of accreditation to both demonstrate and improve on quality of education programmes has been questioned. Ibijola (2014) states that there is fraud and deception with respect to accreditation process of the NUC as many states, without proper assessment establish universities for ego and political reasons. The consequences are that schools suffer lack of adequate facilities and technology to deliver on their mandates. Thus, a fraud-ridden process as observed in accreditation processes today cannot yield any positive platform for improvement in vocational-technical education in particular and the online teaching switch.

Internal (Academic) Quality Assurance

Internal processes for ensuring quality programmes within an institution are particularly important. Although again the process can vary considerably between institutions, at least in the COEs the process should be fairly standard. If there is a proposal for courses within a programme or the whole programme to be delivered fully online, it is likely that the proposal will come under intense internal scrutiny. What is unlikely to be included in a proposal though is what *methods* of teaching will be used. This is usually considered the responsibility of individual faculty members or the Sponsors (Department). It is this aspect of quality – the effectiveness of the teaching method or learning environment for developing the knowledge and skills in a digital age – with which this subject is concerned.

There are many guidelines for quality traditional classroom teaching. Perhaps the most well-known are those of Chickering and Gamson (1987), based on an analysis of 50 years of research into best practices in teaching. They argue that good practice in undergraduate education:

1. Encourages contact between students and faculty.
2. Develops reciprocity and cooperation among students.
3. Encourages active learning.
4. Gives prompt feedback.
5. Emphasizes time on task.
6. Communicates high expectations.
7. Respects diverse talents and ways of learning.

Because online learning was new and hence open to concern about its quality, there have also been many guidelines, best practices and quality assurance criteria created and applied to online programming. All these guidelines and procedures have been derived from the experience of previously successful online programmes, best practices in teaching and learning, and research and evaluation of online teaching and learning. Jung and Latchem (2102), in a review of quality assessment processes in many online and distance education institutions around the world, make the following important points about quality assurance processes for online and distance education within institutions:

1. focus on outcomes as the leading measure of quality;
2. take a systemic approach to quality assurance;
3. see quality assurance as a process of continuous improvement;
4. move the institution from external controls to an internal culture of quality and
5. poor quality has very high costs so investment in quality is worthwhile.

Ensuring quality in online learning is not rocket science. There is no need to build a bureaucracy around this, but there does need to be some mechanism, some way of monitoring instructors or institutions when they fail to meet these standards. At the end of the day, the best guarantees of quality in teaching and learning fit for a digital age are:

1. well-qualified subject experts also well trained in both teaching methods and the use of technology for teaching;
2. highly qualified and professional learning technology support staff;
3. adequate resources, including appropriate teacher/student ratios;
4. appropriate methods of working (teamwork, project management) and
5. systematic evaluation leading to continuous improvement.

Establishment of Internal ICT Policy

Institutions should establish internal ICT policy. This policy should spell out the institution's regulations, vision, standards with respect to software and hardware development and use; developer's right and limitations, patents and related matters on software licences. A right policy will help to galvanise energies into development and use of online teaching facilities. Departments and staff member should exchange ideas and collaborate with one another for effective online learning. The fast learners and users of online teaching facilities should mentor others for improvement and uniformity among the courses and departments.

Conclusion and Recommendations

It cannot be an over-statement to say that vocational-technical education is the engine of economic growth. No nation can prosecute a war without an army. In the same vein, Nigeria cannot develop without well – equipped technical and vocational institutions. For this reason, the nation must invest heavily in education with particular attention given to vocational and technical education. Nigeria should now begin to implement policies aimed at repositioning vocational-technical education for effective competition in the emerging global market. The effort should include up-skilling the vocational-technical education teachers in the use of ICT to facilitate online delivery of pedagogy and implementation of VTE curriculum. United Nation Educational Scientific and Cultural Organization (UNESCO) have noted that revitalizing this sector is among the ways to improve economic opportunities for the youths. Therefore, adequate resources should be allocated to technical and vocational education. Inadequate funds affect the provision of essentials such as enhanced ICT facilities and training manuals. More so, to properly utilize, maintain and cope with the dynamism in the world of ICT and the online teaching facilities, requires skilled and proficient teachers. Also, teachers' preparation should be given a priority attention. There is the need for regular in – service training for teachers to upgrade their skills. Periodical industrial training for teacher is a sine-qua-non in other to keep them abreast with the technological changes in the industry. There is the need for our institutions to establish good relationship and linkages with similar institutions abroad as this will promote cross – fertilization of ideas and enhance technology transfer. By doing this, institutions will have access to new developments, exchange programmes and other numerous benefits available at those institutions whose VTE programmes are well developed and nested in online teaching. Furthermore, when there is collaboration between VTE institutions and industries, the relationship will enable the parties appreciate and understand their needs and workout a model of support for each other that is independent of government financing and thus ensure enhance technological development for online teaching. Again, the curriculum taught in our vocational education institutions should be reviewed to meet the demands of the labour market. Finally, there is need to establish mechanisms for monitoring instructors or institutions to ensure they meet and keep standards. It is important for institutions to enact ICT policy that will help regulate and galvanized the sector. Over time, with increase the ICT knowledge, local software development would begin to thrive among teachers and students. Such activities would require a solid

policy to regulate and define benefits, boundaries, patenting, licensing etc. Effort to entrench online teaching should be on the front burner without reneging because as it appears online teaching has come to stay; it is a matter of time before the traditional face-to-face methods fizzle out.

References

Aduwa-Ogiegbaen, S.E and Iyamu, E.O.S (2005).Using information and communication technology in secondary schools in Nigeria: problem and prospects. *Education Technology and society*. 8,104-112

Banas, J. R., & Velez-Solic, A. (2013). Designing effective online instructor training and professional development. In J. Keengwe, & L. Kyei-Blankson (Eds.), Virtual mentoring for teachers: Online professional development practices, (pp. 1–25). Hershey, PA, USA: IGI Global.

Baran, E. (2011). The transformation of online teaching practice: Tracing successful online teaching in higher education. Iowa State University, Ann Arbor. ProQuest Central; *Pro Quest Dissertations & Theses Global database.*

Black, S. R., & Reich, A. J. (2010). The elephant in the room: Audit culture and TAFE teachers. *Paper presented at the 13th Annual Conference VT Research: Leading and responding in turbulent times, Gold Coast, Australia.*

Brennan, R. E., McFadden, M., & Law, E. (2001). *All that glitters is not gold: Online delivery of education and training.* Adelaide: National Centre for Vocational Education Research.

Brinthaupt, T. M., Fisher, L. S., Gardner, J. G., Raffo, D. M., & Woodard, J. B. (2011). What the best online teachers should do. *MERLOT Journal of Online Learning and Teaching*, 7(4), 515–524.

Chang, W. W. (2016). Digital competence and professional development of vocational education and training teachers in Queensland. (Master of Art (Research), Queensland University of Technology, Brisbane. *VOCED plus database.*

Chickering, A., and Gamson, Z. (1987). 'Seven Principles for Good Practice in Undergraduate Education' *AAHE Bulletin*, March 1987.

Clark, C. M., & Peterson, P. L. (1986). *Teachers' thought processes.* In M. C. Wittrock (Ed.), Handbook of research on teaching, (3rd Ed.). New York: Macmillan Library Reference.

Cox, D and Prestridge, S (2020) Understanding fully online teaching in vocational education. *Research and Practice in Technology Enhanced Learning* 15:16, 1-22 https://doi.org/10.1186/s41039-020-00138-4

Diaz, M. C. G., & Walsh, B. M. (2020). Tele-simulation-based education during COVID-19. The Clinical Teacher in press.

Eley, M. G. (2006). Teachers' conceptions of teaching, and the making of specific decisions in planning to teach. *Higher Education*, 51(2), 191–214.

Ellis, T. J., & Hafner, W. (2003). Engineering an online course: Applying the 'secrets' of computer programming to course development. *British Journal of Educational Technology*, 34(5), 639–650. https://doi.org/10.1046/j.0007-1013.2003.00356.x

FRN (2004), National Policy on Education Lagos. NERDC Press.

González, C. (2009). Conceptions of, and approaches to, teaching online: A study of lecturers teaching postgraduate distance courses. *Higher Education*, 57(3), 299– 314. https://doi.org/10.1007/s10734-008-9145-1.

González, C. (2010). What do university teachers think eLearning is good for in their teaching? Studies in Higher Education, 35(1), 61–78. https://doi.org/10.1080/03075070902874632.

González, C. (2012). The relationship between approaches to teaching, approaches to e-teaching and perceptions of the teaching situation in relation to e-learning among higher education teachers. *Instructional Science*, 40(6), 975–998.

González, C. (2013). E-teaching in undergraduate university education and its relationship to approaches to teaching. *Informatics in Education*, 23(2), 92–92.

Gordon, M. (2018). Why should scholars keep coming back to John Dewey? *Educational Philosophy and Theory*, 48(10), 1077– 1091. https://doi.org/10.1080/00131857.2016.1150800

Griffin, T., & Mihelic, M. (2019). Online delivery of VET qualifications: Current use and outcomes. Retrieved from Adelaide:

Harris, R., & Hodge, S. (2009). A quarter of a century of CBT: The vicissitudes of an idea. *International Journal of Training Research*, 7(2), 122–133. https://doi.org/10.5172/ijtr.7.2.122.

Harshman, J., & Stains, M. (2017). A review and evaluation of the internal structure and consistency of the Approaches to Teaching Inventory. *International Journal of Science Education,* 39(7), 918–936. https://doi.org/10.1080/09500693.2017. 1310411.

Hodge, S. (2014). Interpreting competencies in Australian vocational education and training: Practices and issues. Retrieved from Adelaide

Ibijola, E.Y (2010). Accreditation role of National Universities Commission and the quality of education inputs into Nigerian university system. *Universal journal of Education Research,* 2 (9), 648-654

Institutul de Ştiinţe ale Educaţiei. (2011). Use of information and communication technology in the counseling activity, Retrieved 2015, from http://www.ise.ro/wpcontent/uploads/2011/08/Utilizarea-TIC-in consiliere_2011.pdf

Jaggars, S. S., & Xu, D. (2013). Predicting online student outcomes from a measure of course quality. Retrieved from New York: Jensen, L., Price, L., & Roxå, T. (2019). Seeing through the eyes of a teacher: Differences in perceptions of HE teaching in faceto-face and digital contexts. *Studies in Higher Education,* 1-11.

Jung, I. and Latchem, C. (2012). *Quality Assurance and Accreditation in Distance Education and e-Learning* New York/London: Routledge

Kember, D. (1997). A re-conceptualization of the research into university academics' conceptions of teaching. *Learning and Instruction*, 8(3), 255–275.

Kember, D., & Kwan, K.-P. (2000). Lecturers' approaches to teaching and their relationship to conceptions of good teaching. *Instructional Science*, 28(5), 469– 490.

Kemmis, R. B., & Green, A. (2013). Vocational education and training teachers' conceptions of their pedagogy. *International Journal of Training Research*, 11(2), 101–121. https://doi.org/10.5172/ijtr.2013.11.2.101.

Kemmis, R. B., Hodge, S., & Bowden, A. (2014). Transferable skills in Technical and Vocational Education and Training (TVET): Implications for TVET teacher policies in Australia. *The Online Journal for Technical and Vocational Education and Training in Asia*, 3.

Kennedy, M. M. (2010). Attribution error and the quest for teacher quality. *Educational Researcher*, 39(8), 591–598.

Kilgour, P., Reynaud, D., Northcote, M., McLoughlin, C., & Gosselin, K. P. (2019). Threshold concepts about online pedagogy for novice online teachers in higher education. *Higher Education Research and Development*, 38(7), 1417–1431. https://doi.org/10.1080/07294360.2018.1450360.

Lowenthal, P. R., Nyland, R., Jung, E., Dunlap, J. C., & Kepka, J. (2019). Does class size matter? An exploration into faculty perceptions of teaching high-enrollment online courses. *American Journal of Distance Education*, 33(3), 152–168.

Menchaca, M., & Bekele, T. (2008). Leaner and instructor identified success factors in distance education. *Distance Education*, 29(3), 231-252.

Mocanu, E.M and Deaconu, A (2017). The use of information and communication technology (ICT) as a teaching method in vocational education and training in tourism. *Acta Didactica Napocensia,* 10 (3)

Norton, L., Richardson, J., Hartley, J., Newstead, S., & Mayes, J. (2005). Teachers' beliefs and intentions concerning teaching in higher education. *Higher Education*, 50(4), 537–571.

Okoye, R and Arimonu, M.O (2016). Technical and Vocational Education in Nigeria: Issues, Challenges and a Way Forward. *Journal of Education and Practice* www.iiste.org Vol.7, No.3, 2016

Rodrigues, H., Almeida, F., Figueiredo, V., & Lopes, S. L. (2019). Tracking e-learning through published papers: A systematic review. *Computers & Education*, 136, 87–98. https://doi.org/10.1016/j.compedu.2019.03.007.

Sadler, I. (2012). The challenges for new academics in adopting student-centred approaches to teaching. *Studies in Higher Education*, 37(6), 731–745. https://doi.org/10.1080/03075079.2010.543968

Samuelowicz, K. (1999). Academics' educational beliefs and teaching practices. (PhD), Griffith University, Brisbane.

Samuelowicz, K., & Bain, J. D. (1992). Conceptions of teaching held by academic teachers. *Higher Education*, 24(1), 93–111.

Shi, L., Delahunty, J., & Gao, X. (2018). Constraints preventing Chinese EFL teachers from putting their stated beliefs into teaching practice. *Professional Development in Education,*1-16. doi:https://doi.org/10.1080/19415257.2018.1511455

Smith, G. & Ferguson, D. (2002). Teaching over the web verses in the classroom: differences in the instructor experience. *International Journal of Instructional Media*, 29(1), 61-67.

Sun, A., & Chen, X. (2016). Online education and its effective practice: A research review. *Journal of Information Technology Education Research*, 15(2016), 157–190.

Tondeur, J., van Braak, J., Ertmer, P. A., & Ottenbreit-Leftwich, A. (2017). Understanding the relationship between teachers' pedagogical beliefs and technology use in education: A systematic review of qualitative evidence. *Educational Technology Research and Development*, 65(3), 555–575. https://doi.org/10.1007/s11423-016-9481-2.

Trinidad, J. E. (2019). Understanding student-centred learning in higher education: students' and teachers' perceptions, challenges, and cognitive gaps. *Journal of Further and Higher Education,* 1-11. doi:https://doi.org/10.1080/0309877X.2019. 1636214

Urevbu, A. O (2015). Actualising sustainable high standard of quality in Nigerian Education: The Role of teacher education, School and Society. Keynote address delivered at the 2nd Annual International Conference held at the Faculty of Education, University of Benin, Benin City.

Uwaifo, V.O and Uwaifo, I.U (2009). Training technology and vocational education teachers for the new 9-3-4 education system in Nigeria: Its problems and prospects *International NGO Journal* Vol. 4 (4), pp. 160-166, April 2009 Available online at http:// www.academicjournals.org/INGOJ

Uwaifo, V.O.(2009). "Technical Education and its Challenges in Nigeria in the 21st Century. *International NGO Journal* Vol. 5 (2), 40-44.

Vandenbroucke, F (2014). Information Technology and Communications Technology (ICT) Integration in the NationalCurriculum Informatics Disciplines. https://programareliceu.files.wordpress.com/2014/07/suport_de_curs_integrar e-tic-ininformatica.pdf

Vasiliadou, R. (2020). Virtual laboratories during coronavirus (COVID-19) pandemic. *Biochemistry and Molecular Biology Education*, 48(5), 482–483.

Wheelahan, L. (2005). Theorising the relationship between the individual, knowledge and skill. Paper presented at the AVET RA 2005 - Emerging futures: Recent, responsive and relevant research, Brisbane. http://www.avetra.org.au/documents/ PA037Wheelahan.pdf

Wheelahan, L. (2009). The problem with CBT (and why constructivism makes things worse). *Journal of Education and Work*, 22(3), 227–242.

Wheelahan, L., & Moodie, G. (2011). The quality of teaching in VET: Final report and recommendations: Australian College of Educators.

Wojnar, L. (2002). Research summary of a best practice model of online teaching and learning. *English Leadership Quarterly*, 25(1), 2-9.