The Relevance of Technology-mediated Learning for Labour Skills Development among University Students in Post Covid, Nigeria

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Abstract

The sustenance of education in the face of competitive pressure requires the inculcation of learning strategies that will prepare students with relevant labour skills for the world of work and self-employment. This agrees with the purpose of tertiary education in Nigeria which is targeted at the production of high-level manpower. This could be achieved through technology-mediated learning which emphasizes a blend of traditional and information and communication technology-based learning. This study, therefore, provides a theoretical relevance of technology-mediated learning to skill development among university students in Nigeria.

Keywords: Labour, manpower, technology-mediated, skills, development, relevance

Introduction

The labour market description of most Nigerian graduates as bereft of relevant labour skills is an outright indictment of the University system which is charged with high-level manpower production. This fall in expectations could be attributed to the connectivity gap between the demand and supply of labour. The remedy would be contingent upon viable relationships between the institutions of learning and the workplace, due to the evolving labour market demands. The changes in workplace demands require an attendant change in the university curriculum to avoid any form of skills mismatches otherwise the academic institutions will be busy churning out graduates who can neither function effectively in the workplace, nor be favourably self-employed. The necessity for this was intensified by the effect of the covid-19 pandemic that involved a total shutdown of the economy globally, for a period of time. While

many lost their jobs, and others could not carry on with their businesses, highly skilled individuals were gainfully busy. This attests to the relevance of a skill-based curriculum in the university system in Nigeria, which appears to be lacking at present.

Moreover, the effect of globalization has generated much pressure for the workplace having introduced some complexities which are not possible to be overlooked. These complexities range from a drastic change from manual labour and archaic work culture to electronic devices and high profiled office culture and work mannerisms. The palpable implication is that the abilities of the 20th century can no longer suffice in the 21st-century workplace given the influx of new technologies and skills needed to operate them. Expectedly a consequent adjustment in curriculum and instructional methodologies and techniques in educational institutions becomes imperative to meet up with the demands of the emerging workplace. It will be foolhardy then for any institution to think that the curriculum that worked in the previous era will still be relevant today. The absence of this adjustment in well-structured forms has placed many universities in developing countries in a bad light as they consistently occupy the lower rungs of the networked readiness index ladder, with Nigeria not left out (World Economic Forum, as cited in Ibara, 2014).

The education system here appears to be oblivious of the fact that the sustainability of education cannot be determined by mere understanding of concepts, but rather by the extent that knowledge is applied and skills are developed by students. Since globalization aims at creating global citizens, it only makes good sense that the skills needed to function in this global space be inculcated in training these global citizens. The intent, of course, is to match learning with relevant skills through adequate preparation of students for the world of work, beginning from the primary level of education to the tertiary level. This preparation would entail the use of teaching and learning techniques that will stimulate students to critical thinking, creativity, collaboration, communication, information literacy, media literacy, technology literacy, and flexibility, which are sought-out-for skills in the labour market. The university system cannot renege on this responsibility that falls within its purview; having been charged with the responsibility of not just training students in computer operations but developing them into digital citizens who have gained mastery of the use of technology appropriately and responsibly; and who also have mastered proper etiquettes of online communications as well as the digital

obligations and rights required for blended and online education settings (Elmes, 2017). To this extent, it could be said that the challenge before the university system today is to satisfy the needs of students by aligning their programmes with deeper learning results and the development of 21st-century skills, supported by individualized learning approaches and data-driven support systems for students, which promote the achievement of goals and productive employment (Elmes, 2017). Within this background, therefore, there is a need for a shift to a more inclusive approach that tends towards skill development for students more productively in the workplace. It is on this premise, that this study theoretically examined the relevance of technology-mediated learning for labour skills development among students in public universities in post-covid Nigeria. The study uses technology-mediated learning concurrently with TML and blended learning.

Concept and Components of Technology-Mediated Learning

Technology-mediated learning (TML) is discussed in this study as an integration of information and communication technologies into the traditional face-to-face classroom learning for more productive outcomes. To properly operationalize technology-mediated learning within the school setting, the study conceptualizes the indicators in a way that directly relates to the processes of teaching and learning, which are, institutional characteristics, students' readiness, and instructional process. Institutional characteristics account for the universities' preparedness for technology-mediated learning, which includes the availability of technological and regular materials for teaching and learning, provision of a conducive learning environment, and the availability of tech-savvy lecturers. Students' readiness refers to the disposition of students to the use of technology, based on prior knowledge, motivation, prospects, technology readiness and self-regulation (Bitzer, Söllner, and Leimeister, 2013). Armed with these characteristics, students' chances of engagement in the classroom become very high; and are thus able to acquire relevant skills. The instructional process, on the other hand, focuses mostly on interactions among students, between students and lecturers, and between students and learning tools, which are processes through which students make meaning out of teaching/learning experiences. Meaningful interactions will result in desirable outcomes while the reverse becomes the case in the event of unproductive interactions.

In this context, Alavi and Leidner (2001) defined TML as an environment where advanced information technologies mediate the interaction of learners with their trainers, peers, and learning materials; where information technology depicts communication, computing, and technologies for data management and the gathering together of all such. Alavi and Leidner focused on learning from instruction which Sheull and Lee (as cited in Alavi & Leidner, 2001) described as a situation where an individual deliberately attempts to influence another's learning environment by arranging the learner's environment in such a way that desired results would be achieved. On the features of TML, Alavi and Leidner addressed the need for a consideration of the relationship among technology capabilities, instructional strategy, and psychological processes and stressed that learning outcomes are impacted not just by the features of technology, but by the collective influence of instructional strategy, technology features, and psychological processes.

In the same vein, Krishnakumaryamma and Venkatasubramanian (2018) described TML as teaching and learning approaches that utilize the potentials of education technology; explaining that the use of technology and digital devices which appeared in the classrooms in the last decade as experiments have finally found a permanent place in teaching and learning. This according to Krishnakumaryamma and Venkatasubramanian has resulted in the transformation of the classroom by introducing innovativeness and impacting educational needs as it relates to content and the delivery of educational services, while at the same time mounting pressure on policymakers to acquire new technologies.

Similarly, in a research study on Technology-mediated learning, Saade, Buyukkurt, and Alkhori (2011) explain that education has upgraded from the traditional method of teaching only in the classroom to new digital e-learning where teaching is carried out online and when done in the classroom setting, such teaching is assisted by technology. Saade, Buyukkurt, and Alkhori also described TML as a combination of e-learning, and computer-assisted learning that makes use of any form of technology; indicating that certain factors which may directly or indirectly relate with each other exert considerable influence on this form of learning. This goes to show the determination within the sphere of education to adapt to the changes that technological advancement and globalization has thrust on the system. Furthermore, Saade, Buyukkurt, and Alkhori identified four dimensions of computer-mediated learning which could be used for a

better understanding of students' attitudes towards TML. They are, affect, attitude, extrinsic motivation, and intrinsic motivation.

Furthermore, Arthur et al. as cited in Bitzer, Söllner, and Leimeister (2013) acknowledged the influential nature of technology in the context of learning and maintains that technology-mediated learning is a major development in education. Following this line of thought, Garrison and Kanuka as cited in Bitzer, Söllner, and Leimeister (2013) argued that the objective of TML is to incorporate the strengths of synchronous (face-to-face) and asynchronous (IT-based) learning activities (p.2) into a learning process for more productive outcomes. Bitzer, Söllner and Leimeister identified four major components of TML services, which are, the structural quality component comprising of the trainer characteristics, the learning environment, IT system quality and learning materials; service recipient, comprising (Previous-) Knowledge, motivation, technology readiness, self-regulated learning, and expectations; process quality, involving interactivity, IT-process support, learning group, quality of exercises, transparency of the training process and fit; and service result quality, made up of satisfaction and learning success.

Discussing the fundamentals of blended learning, Saliba and Rankine (2013) opined that blended learning denotes a tactical approach geared towards the combination of times and styles of learning and the integration of face-to-face learning and online communications using relevant information and communication technologies; while Regha (2017) considers TML as a broad term which covers diverse teaching and learning methods which are supported by the utilization of information and communication technologies (ICTs) and defined it as a teaching and learning method that integrates online learning strategies with face-to-face teachings in the most effective manner for optimum learning results.

Technology-Mediated Learning and Labour Skills Development

The essential nature of skill development among university students stems from the need to have students prepared and empowered for the emerging workplace. This agrees with the National Policy on Education in Nigeria which stipulates that the goals of tertiary education shall be among others to contribute to national development through high-level manpower training; provide high-quality career counselling and lifelong learning programmes that prepare students with the knowledge and skills for self-reliance and the world of work; and reduce skill shortages

through the production of skilled manpower relevant to the needs of the labour market (FRN, 2013). Part of the means as stated in the National Policy on Education through which Nigeria intends to realize the goals of education and gain from its contribution to national economy was to ensure that teaching at all levels is practical, activity-based, experiential and IT-supported (FRN, 2013). This goes to prove the relevance of technology for capacity building and human resource development; and further strengthens the main objective of technology-mediated learning which is to incorporate the strengths of face-to-face and IT-based learning into a single learning strategy which becomes the practice for institutions of learning (Garrison & Kanuka, as cited in Bitzer, Sollner & Leimeister, 2013). To successfully practise this, the different components of technology-mediated learning must be well articulated in the school system and properly coordinated. This is because; when appropriately practised, TML can add value to teaching and learning experiences by introducing innovativeness, meaningful teamwork or independent learning, and interactions with the virtual world. This way, students will gain more exposure to global issues as well as gain such skills as teamwork, creative writing, critical thinking, reading, mediation and communication through interactions and observations.

This portends a great future for education in the light of the transition to the knowledge economy which has brought dramatic changes in education both in quantity and quality; resulting in a greater demand for a highly skilled and educated workforce, as well as consistent learning and improvement of workers skills (Alavi & Leidner, 2001). Furthering on this thought, the United Nations Educational Scientific and Cultural Organization [UNESCO] (2017) pointed out that the multiplier effects of globalization, the transition from the industrial to the knowledge economy and innovations and revolutions in science and technology have carved out the need for new spheres of disciplines and knowledge at all educational levels and training; indicating that integrating ICT in teaching and learning processes will enable people at different levels and in different places to discover information, acquire knowledge, skills, ideas and experiences which may not be received otherwise.

To further buttress the need for TML, it is imperative to refer to the transformations that technology has brought about in different sectors of the economy where students are being prepared to work in. It is worth mentioning here that some sectors like Finance and Banking, have witnessed real transformation with the integration of ICT in its operations. Today, we have

fully developed mobile and internet banking, Automated Machines (ATMs), Master Cards and so on. Other sectors like commerce and industry, hospitality, oil and gas, entertainment, amongst others, have also had their share of the transformations wrought by technology. The sustainability of these sectors depends largely on economic influences and the workforce. Therefore, amid scarce resources and given the dwindling condition of the economy in many countries, it becomes only logical for organizations to show an unbiased preference for highly-skilled graduates, in an understandable effort to maximize profits and minimize the cost of manpower training. The education sector needs to be equally, if not more involved with technology as the producer of relevant manpower to maintain a normal demand and supply curve, where supply matches the demand. This explains the need for improvement in the connections between the pathways of education and the labour market, to bridge the obvious gap that exists between the two, that arises from policy frameworks which do not augur well with the realities of the labour market (Wheelahan, Buchanan & Yu, 2015); hence, the consideration for frameworks that revolve around the integration of technology in university education for labour skills development. There is no gainsaying the fact that technology provides viable opportunities for capacity building in education.

In acknowledging the relevance of technology in the production of the workforce for the emerging workplace, Devaux, Belanger, Grand-Clement and Manville (2017) indicated that the increasing need of technology in the workplace requires that employers of labour will need a workforce with additional abilities. Devaux et al. argued that though some studies did not find any positive relationship between the extent to which learners use computers at school and their performance in some subjects, Devaux et al. maintained that the emphasis on the functionality of technology is on how the technologies are used, and not in the technologies, stressing that technology can make learning experiences more engaging for students, as well as promote deep learning. Devaux et al. used deep learning to express the idea that students are not just to learn subject contents but are also to apply such content areas to practical situations which are made possible when technology is properly used by educators in the teaching and learning process. By so doing, learners develop such skills as communication, problem-solving, critical thinking and digital navigation skills. This puts the bulk of the work on the educator.

Contributing to this, Krishnakumaryamma and Venkatasubramanian (2018) presented the potency of TML in aiding students to develop different types of skills ranging from the very

basic skills to the higher-order skills. The explanation to this is that with the emergence of technological devices such as computer-supported problem-solving systems, electronic decision boards, wireless laptops, video devices, and web-based-mediated instructional systems, to support teaching and learning processes, makes classroom experience quite engaging leading to productive outcomes for learners. Thus, the skills teachers acquire in the course of training are transferred to the learners via the teaching-learning process. The utilization of these technologies also offers students the opportunity to acquire relevant skills that will aid their functionality in the 21st-century workplace. Interestingly, TML has an inherent capacity to enhance students' acquisition of technological skills by arming them with such skills as data gathering and retrieval, information processing, organizing, compiling, analytical skills, and decision making. Notwithstanding, the inbuilt abilities of TML cannot be exploited except students are exposed to proper learning tasks (Krishnakumaryamma and Venkatasubramanian, 2018). Within this context, TML appears most appropriate given its methods of assigning projects and requiring problem-solving, which are outstanding techniques for the development of self-regulation, independent learning, decision-making and analytical mindsets. Therefore, skill development remains an explicit system of learning as it is a determinant of quality education; and reportedly "the global currency of the 21st Century" (Partnership for 21st-century skills, as cited in Krishnakumaryamma and Venkatasubramanian, 2018).

Implementation of Technology-Mediated Learning in Nigerian Universities: Issues and Challenges

Although many countries have leveraged the advantages of TML in universities to build strong institutions, the integration appears to have been bedeviled by a lot of challenges in Nigeria. This section takes a critical look at the issues, problems and challenges facing the integration of technology in the Nigerian university system. The major challenges are listed as follows:

Institutional Failure

Nigeria, the giant of Africa with a population of over 193 million, (National Population Commission [NPC], 2018) has suffered the devastating effects of brain drain and preference for foreign services, which could be attributed to institutional decay in Nigeria. It is quite clear that institutions are critical to the effective operations of society, as observed by Ejimudo (2013),

who argued that effective and efficient institutions are the bedrocks to the survival of any society because the achievement of the public good is the fundamental philosophy behind the existence of every modern society. Therefore, the appropriate placements and effective operations of the institutions are prerequisites for every society. This position stands tall globally but has witnessed diverse forms of abuse mostly in African countries, notwithstanding the popular African philosophical and sociopolitical thought as preserved in Ubuntu, Omoluabi and Ujamaa (Yagboyaju & Akinola, 2019). These are philosophies that are based on preference for public interest and selflessness in governance, as against the self-interest and greed on display. Consequently, the Nigerian society is beset with crisis on every side, ranging from corruption, politicization, unethical practices, nepotism, poor management and all forms of inefficiency (Ejimudo, 2013). This overwhelming effect of institutional failure, therefore, could account for the late introduction of technology in Nigerian education (Ibara, n.d), with the resultant effect of a skills gap.

Unstructured Policy Frameworks

It is instructive to note here that it is the prerogative of the government to provide relevant policy frameworks upon which the integration of technology in education can effectively operate. The first attempt towards this came with the enactment of the 1988 policy on ICT, the National Policy on Computer Education (FME, 1988). The policy had a five-year mandate to facilitate and fully integrate ICT in education; but never achieved its mandate except for the distribution and installation of personal computers across states (Okebukola, as cited in Aguwa-Ogiegban & Iyamu, 2005). Furthermore, in 2001, the Federal Government of Nigeria published the National Policy on Information Technology and established the National Information Technology Development Agency (NITDA) as the implementing body. One of the strategies for achieving the objectives of this policy was to make the use of Information Technology (IT) mandatory at all levels of educational institutions through adequate financial provision for tools and resources.

Following up on this, the Federal Ministry of Education (FME) released a document in 2004 on the Ministerial Initiative on e-education for the Nigerian Education System. This is one of the initiatives by the government for the attainment of Education for All (EFA), and the Millennium Development Goals (MDGs), using ICT as delivery systems. The overall objective was to improve the education delivery system and ensure optimal utilization of existing ICT resources to promote quality education and globally competitive education system (FME, 2004). These

policies for the implementation and use of ICT in the Nigerian system of education have been strongly criticized as not having translated into reasonable practice, lacking in content and structure, and as a result could not adequately take care of the ICT needs of the Nigerian education system (Yusuf, as cited in Oyelekan, 2008; Jika & Luka, 2014). However, in 2019, a new National Policy on Information and Communication Technology was launched (FME, 2019), with an attendant implementation guideline. The focus was to produce students with vital universal skills that will make them productive citizens. Perhaps, with this policy document, the integration of ICT in education will be more structured, all-encompassing and far-reaching.

Lack of Trained Manpower

To keep abreast with the dynamics of education, and acquire the required skills and knowledge to successfully integrate technology into the curriculum to address students' needs, lecturers need on-going professional development, and training on the use and application of technology in instructional processes (FME, 2019). But lack of adequate provisions for training and professional developments have produced a bunch of lecturers who are averse to technology; and who show preference to the traditional method of teaching with paper and pen, books, chalkboards and in some instances with some electronic devices such as tape recorders, overhead projectors and televisions which have been described as obsolete. In this regard, Kpolovie and Akpelu (2017), described Nigerian lecturers as "digital-illiterates or analogue lecturers" (p.3) whose knowledge of technology cannot match those of their students. In the same vein, Johnson, Jacovina, Russel and Soto, (2016) maintained that although teachers are appreciative of the gains of educational technologies, it is often quite challenging for them to adjust to the integration of technology into the teaching and learning process. Given this situation, it becomes increasingly demanding, complex and difficult for teachers to extensively utilize these tools for the good of students (Johnson, Jacovina, Russel & Soto, 2016). This situation, according to Kpolovie and Akpelu cannot produce competent graduates for the emergent workplace.

Poor Power Supply

The intermittent and frequent power outages that characterize the communities where universities are domiciled have been a major constraint on the effectiveness of the use of technology-mediated learning in classrooms. Aduke (2008) observed that the erratic power

supply in Nigeria has had its negative toll on the effectiveness and efficiency of ICT devices in Nigerian Universities; therefore its utilization should not be treated in isolation but in collaboration with power providers (Chukwusa, 2015). As a means of ensuring that learning continues optimally despite the power challenges encountered, university management often resort to the use of power generators. This has however resulted in a remarkable increase in the recurrent costs thereby placing a hold on the sustainability of learning with the aid of technology. Devices that have been abandoned due to minor faults caused by frequent power outages have also become a common sight in the classrooms because a majority of the devices solely depend on electricity supply for effective performance. The implication is that as long as power remains a challenge in the universities, the efficiency of the available classroom technologies will continue to dwindle.

Access or Connectivity Issues

The internet is a major driver of technology-mediated learning, and access to technological equipment is a basic step towards integration. Without a strong, fast and reliable bandwidth and a good internet connection, students will not benefit from the hardware provided to support learning. The reason being that good internet connection provides an opportunity for students as well as lecturers to access information as and at when needed, and for local and international interactions. As highlighted by (Aduke, 2008), the bandwidth determines the amount of information that can be sent or received at a point on a computer network. Similarly, lack of access to technological tools also poses a strong challenge to integration. Ajegbelen (2016) discovered that students and lecturers in many Nigerian universities patronize commercial cyber cafes, while those that can afford it buy private modems. This is not encouraging for learning in this era. It is, therefore, an imperative for university managers to invest in technological tools, and connectivity infrastructure that will support the efficient use of technology for learning in the classroom.

Theoretical Perspective

The social cognitive theory made direct contributions to the variables that formed the crux of this study. The social cognitive theory was an offshoot of the social learning theory by Albert Bandura in 1986. Here, Bandura (1986) postulates the concept of reciprocal determinism, by

emphasizing that learning takes place within a social setting where a dynamic and mutual interaction occurs among personal factors, behaviour and environment. Within this context, individuals can learn new knowledge or behaviour by simply observing others or a model who might be a teacher or peers. This is a core idea in social cognitive theory; and can occur through attention, retention, production and motivation. Another key factor in social cognitive theory, according to Bandura is the distinctive way whereby individuals obtain and maintain behaviour, taking into consideration the social context in which such behaviours are carried out by the individuals. The theory takes into consideration the past experiences of a learner which is a major determinant of the occurrence of behavioural actions. The past experiences, exert much influence on expectations, expectancies and reinforcements, which all constitute determinant factors of specific behavioural performance. Furthermore, the theorist also offered explanations to how goal-directed behaviour can be achieved and maintained over time, by self-regulated behaviour through control and reinforcement. This aptly explains the interactions that take place among variables in technology-mediated learning (students' readiness, institutional characteristics, and instructional processes) that would enable skill development among students.

Conclusion

The need for a skilled workforce is a driving force for the integration of technology in the teaching-learning process. Although this integration does not occur without some challenges, particularly in a developing economy like Nigeria, it is rightly observed that it is achievable to the extent that universities consider it a priority. The essential position of prioritization in achievement underscores the reason for high and low achievements among people, organizations and businesses. While it has become obvious that lack of relevant labour skills is a major precursor to graduate unemployment, the universities appear not to be engaged in meaningful integration of ICTs in the regular classroom and also appear not to consider it a priority. The sublime contributions of TML in labour skills development as highlighted in this paper cannot be ignored; therefore, the paper submits that technology-mediated learning, if properly structured in the Nigerian university system, will significantly enable skill development among students and enhance their employability status as graduates.

Recommendations

Based on the findings of the study and the conclusions drawn therefrom, the following recommendations were made.

- Universities should prioritize their needs, by recognizing that skills development is a necessity for competitiveness in this 21st century and so target funds to ensure that the institutions are compliant with evolving technology at all times. Funds should be devoted to the professional and technological development of lecturers in emerging trends in classroom technology and related strategies, for effective and efficient utilization in and beyond the classroom environment. This action is not a one-off task, but a continuous effort that puts the institutions in their proper position in the scheme of educational development.

- Universities should be deliberate in the supply of technological devices that support instructional delivery, by focusing on technological tools that are relevant to the needs of the students. Such supplies when received should be put to productive use and not be left to rot away in the stores. This will amount to waste of time and other resources.

- Students Union and University Management should target the social capital of relevant stakeholders in and outside the telecom industry as part of their corporate social responsibility (CSR), for the provision of technological tools and affordable internet services to reduce the financial burden on students and lecturers.

- There should be a shift from dependence on nonrenewable sources of energy to renewable sources for powering classroom technology. This will reduce the frequent power outages that contribute to a reduction in the life span of technological devices.

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