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CHALLENGES AND PROSPECTS OF ONLINE INSTRUCTION OF VOCATIONAL SUBJECTS BY TVET INSTITUTIONS IN KENYA DUE TO COVID-19

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Abstract

Education in the 21st century has shifted from teacher-centered to learner-centered approaches where cognitive, psychomotor, and affective domains are key in preparing school graduates for the world of work. The role of Technical and Vocational Education and Training (TVET) is to ensure the artisans and technicians acquire expected attitudes, skills like creativity, innovativeness, digital literacy, and problem-solving for the prosperity of an economy. TVET sub-sector has a poor image and is seen as a domain for the academic dwarfs. It has been poorly endowed with resources, especially in developing countries. The use of digital literacy, e-platforms have been sparingly applied in TVET when it comes to enhancing teaching and learning. Since the outbreak of Covid-19, there have been disruptions in learning due to the closure of institutions and this has led to the adoption of online teaching. This paper is grounded on desktop research which presents results from studies conducted on how instructors and learners in TVET institutions have been affected by Covid-19 and opportunities during the pandemic. Some challenges include widened contact between the teachers and learners, digital imbalance, limited demonstration of required competencies, ICT Competencies, and lack of virtual remote labs/workshops where the learners can continue with the learning of the competencies. Some opportunities include the creation of virtual labs, instructors were able to programme for tutorials that would allow students to access e-platforms at their own time, online learning had no limited space compared to physical learning and institutions had time to review their curriculum.

Keywords: *Online instruction, Covid-19, Information and Communication Technology, TVET institutions*

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1. Introduction

The outbreak of Covid-19 did not only caused disruptions in learning institutions but also compelled many governments to introduce and adopt online instruction to ensure that students have access to education materials while at home (Adedoyin & Soykan, 2020). However, this has an impact on competencies and skills acquired by learners. The origin of online learning in the world can be traced back to 1960, at the University of Illinois, USA. However, during this period, the internet had not been invented and students started learning from computer terminals that were connected to form a network. The first online class course was offered by the University of Toronto in 1984 (Palvia et al., 2018). Online learning was aimed at ensuring that students who could not physically access school could get training while at home. Therefore, most courses were offered in the evening when these students were free from their daily duties through through online learning which majorly has relied on the use of information and communication technology digital literacy (Means et al., 2009).

When learning institutions in Kenya were physically closed in the year 2020 due to the Covid-19 pandemic, stakeholders in the education sector had to quickly figure out how to bring about continuity of learning among the learners at all levels. In post-secondary TVET, physical learning was stopped and there was online training of instructors on how to conduct teaching and learning using e-platforms (United Nations, 2020) Learning institutions were tasked with looking for ways and means of sustaining learning. However, teaching and learning was a challenge for most TVET institutions given that almost all the courses are hands-on subjects and the majority of institutions lacked the resources needed for instruction. For the few who managed to acquire resources, there was limited personnel to offer online training since most teachers were used to face-to-face and were not familiar with conducting online classes (Regional Centre for Mapping for Sustainable Development, 2021).

In Kenya, TVET students and instructors in urban centers had better access to e-learning resources due to ease of affording internet, smartphones, and laptops compared to those students from marginal and remote areas. In some rural areas, there is no electricity supply, power outage and internet connectivity is poor. In addition, some students both in rural and urban areas lacked digital devices that can be used for online classes. Some students ended up deferring studies due to ICT challenges (Chepyegon, 2020). Desktop research was done by reviewing relevant Government documents including the guidelines by the Ministry of Education, and the Ministry of Health, relevant policies reported by peer-reviewed journals by several scholars and authorities around the globe.

1.1. Relevant scholarship

In New Zealand, the students in universities had concerns about the financial implications of online learning compared to face-to-face instruction. Many students preferred direct interaction with teachers and ended up missing attending online classes due to the inability to raise fees, different time zones, poor inaccessibility to a stable network especially in rural and remote areas (Pather et al., 2020). In addition, given that most teachers are more used to physical learning than online class instruction, during the Covid-19 period, the instructors' job security was challenged given that most teachers have fewer skills in ICT operation. There is still uncertainty about job security given that the employment of instruction using recorded audio and visuals may lead to reducing the number of instructors. Training an adult person tends to be a challenge since most of their preference changes with age more especially when it comes to technological change (Park & Choi, 2021).

The primary school teachers in New Zealand reported that meeting learners' needs online was a concern, especially when working from home since they had to monitor and control their children, while at the same time monitoring the progress of online classes (Subrahmanyam, 2020). In addition, the primary school teachers said that they felt socially isolated from the students and there was limited mentorship (Flack et al., 2020). The study indicates that 39% of educators from Australia and 42% from New Zealand reported that they were not confident on use of ICT and online instruction, "it is like being a beginner teacher again not knowing what to teach and how to teach, what works well and what doesn't," one of the teachers reported classes (Subrahmanyam, 2020).

Globally, many countries are focused on promoting education equity and education for all. The outbreak of Covid-19 however has caused a great gap and academic imbalance between students in urban areas and those in marginalized areas. For instance, a study conducted in the United States of America indicates that learning science courses was affected by online learning since students in remote areas failed to access education materials due to low network coverage and inaccessibility to electronic devices like mobile phones and laptops (Brancaccio-Taras et al., 2021). Examination invigilation minimizes cheating and increases integrity. However, with online instruction, the invigilation of examinations is a challenge since teachers have a limited scope of view to a learner's environment thus aiding cheating (Gamage et al., 2020). Assessment of vocational courses for learners with disabilities and those who require extra time was a challenge during the Covid-19 period. For instance, despite students and lecturers being aware of collusion and the associated risks, some universities reported simply accepting collusion as unavoidable in their solutions to curb exam malpractice, as exemplified by one strategy in which assessment incorporated higher-order questions and adopted open-book exams (Pather et al., 2020).

In India, the impact of Covid-19 on higher education led to numerous changes in vocational subjects after lockdown including the closure of learning institutions. The approach to promote the acquisition of required competencies was the introduction of virtual labs which are web-enabled and contained curriculum-based experiments designed for remote operation **(Jena, 2020)**.

1.2 Theoretical Framework and implications

This article is grounded on two theories; the theory of social change and the diffusion innovation theory as shown in figure 1. The diffusion innovation theory of E.M. Rogers of 1962 postulates that over time, an idea or product gains momentum as it spreads through a given population. The ultimate result of this diffusion is that people or a population, adopt a new idea, behavior, or product (Institute of Construction Materials & Sartipi, 2020)**.** Adoption means that a person does something different than what they had previously. The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative. It is through this that diffusion is possible. The theory postulates further that there are five established adopter categories when an idea or innovation emerges and they include;

1. Innovators – these refer to a group of individuals who are always the first to accept change and accept innovation for its sake. They take the shortest time to learn and even they are volunteers and risk-takers as they want to be agents of change.
2. Early Adopters - These are people who represent opinion leaders who wish to serve as role models and need nobody to convince them to accept change since they are aware of it.
3. Early Majority - These people are rarely leaders, but they do adopt new ideas before the average person. These people always want to see the evidence that the innovation works, they even need to try it out from others, listen to success stories before making a decision.
4. Late Majority - These people are skeptical of change, and will only adopt an innovation after it has been tried by the majority. Strategies to appeal to this population include information on how many other people have tried the innovation and have adopted it successfully.
5. Laggards - These people are bound by tradition and very conservative. They are very skeptical of change and are the hardest group to bring on board. Strategies to appeal to this population include statistics, fear appeals, and pressure from people in the other adopter groups.

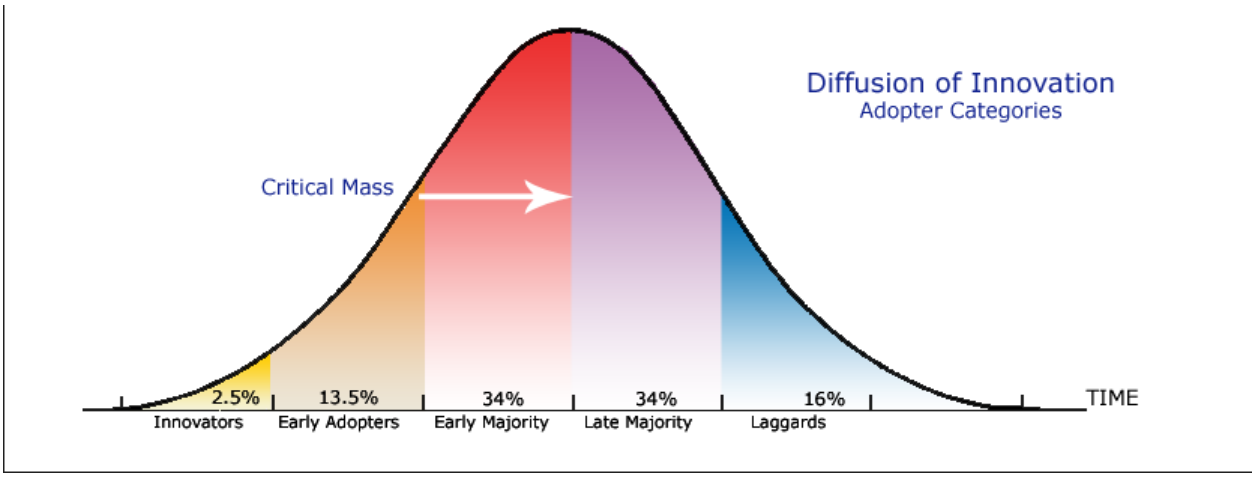

Figure 1: *Diffusion of Innovation*

Source: Institute of Construction Materials and Sartipi (2020)

Like most–innovations, online instruction strategies spread from one individual to another. During the onset of Covid-19, many instructors and students who were used to classroom physical instruction did not believe that one can teach or learn through online platforms. There was high tension by instructors on how to introduce the lesson, monitor class, and manage the attendance. However, as time–went by, it became evident that online instruction is more convenient and time-saving than physical learning. But the laggards are there who believe that online instruction cannot work as well as physical learning does. Regarding this, this theory is relevant to this study since it gives an insight into why people behave in unique ways once there is an innovation and how they can strategically be encouraged to accept change.

1.3. Theory of Social Change

The theory of social change confirms that change is recognized when individuals, communities or society adjust and/or abandon associated norms and values regarding some external or internal factors (Serrat, 2017). According to Serrat (2017), change is complex and it is not easy. However, change is multidimensional and it is determined by the following aspects;

1. Discursive—a change in the narrative(s) that actors hold about a concern, problem, or issue.
2. Procedural—a change in the way the processes that manage a concern are carried out.
3. Content-based—a change like a concern.
4. Attitudinal—a change in the way individuals think about a concern.

5. Behavioral—a change in the way actors behave about a concern, in other words, act or interface with others, in consequence of formal and informal changes in discourse, procedure, content, or attitude.

The theory of change is significant in this study given that for individuals to shift from physical learning to online instruction they need to change from what they are familiar with and learn new ideas. They are expected to view change from discursive, procedural, attitudinal, and behavioral aspects such that a teacher can be an all-around changed person to accept and embrace new roles and tasks

2. Method

Desktop research was done by reviewing relevant Government documents including the guidelines by the Ministry of Education, and the Ministry of Health, relevant policies reported by peer-reviewed journals by several scholars and authorities around the globe. The data obtained were analyzed using qualitative data analysis methods.

3. Results

3.1. Opportunities

According to research conducted in Australia and New Zealand, online instruction intensified during the Covid-19 pandemic. Institutions embraced both synchronous (traditional way of classroom instruction where learners have immediate feedback) and asynchronous (recorded classes where feedback is through email) modes of teaching to ensure learners acquired skills for "hands-on" subjects and practical laboratory lessons. However, online teaching came with challenges not only to students but also to the teaching staff (Pather et al., 2020). If institutions embrace asynchronous it means that an instructor will have time to run other programmes as students attend to assignments

In the Philippines, physical learning was stopped and both private and public universities shifted to offer online teaching whereby teachers uploaded teaching materials to google platforms. After three days of teaching, the Commission on Higher Education (CHED) suspended online learning since the teachers were unable to manage large numbers of students attending classes. However, amidst the Covid-19 pandemic, there were opportunities for institutions to review and modify their teaching methods apart from physical classroom instruction (Toquero, 2020).

Despite the closure of face-to-face learning for institutions in India, learning platforms were created. The website (http://www.vlab.co.in/) has 100 Virtual Labs consisting of

approximately more than 700 web-enabled experiments which are designed for remote operation It provides access to laboratories in various disciplines of Science and Engineering (Jena, 2020).

The experience in South Africa was not different after an increase in the number of Covid-19 cases. The national state declared the pandemic a national disaster and this led to countrywide lockdown, ban of social gatherings, and closure of learning institutions. Online classes were introduced to avoid interruptions to the academic calendar. The department of Education made use of television and radio stations to offer virtual lessons for students during the lockdown. Online classes provided opportunities for students to attend classes more easily with space not being a limiting factor as it was with face-to-face instruction (Mhlanga & Moloi, 2020).

Therefore, the opportunities that can be explored as a result of the sudden transition in pedagogy occasioned by Covid-19 include: the creation of virtual labs, instructors were able to programme for tutorials that would allow students access e-platforms at their own time, online learning had no limited space compared to physical learning which restricts the number of individuals per class and institutions had time to review their teaching methods and curriculum.

3.2. Challenges

The prime impact of Covid-19 was the closure of all learning institutions based on guidelines given by the Ministry of Health (MoH) and the Ministry of Education (MoE). Among the guidelines were social distancing and avoiding public gatherings to mitigate the quick spread of the Covid-19 virus (Ministry of Education, 2020). The response by institutions of higher learning was to offer online classes. This was done through the use of radio stations, television channels, and teleconferencing tools to ensure course and syllabus coverage (Ngwacho, 2020). Schools are social hubs where individuals interact and learn through physical interaction. This social interaction enhances greater mental development than online instruction (United Nations, 2020).

3.3. Digital Imbalance

The online instruction required the use of ICT devices, electricity, and network coverage. The underprivileged students from poor or remote and rural areas in Kenya found it difficult to access classes due to poor network connection and electricity fluctuations or lack of it. In some instances, some homes reported being unable to afford the radio and this made it difficult to ensure education equality and promote the education right for all students (Bozkurt et al., 2020).

3.4. Limited demonstration of required competencies

Vocational courses are taught through hands-on activities that require demonstration, illustration, and practical work that enables the learners to acquire skills. However, during the online instruction, learning was grounded on sending assignments by the instructors to students through email, posting assignments to e-learning platforms. This mode of teaching and learning had minimum interaction and feedback from students thus compromising acquisition and demonstration of skills and competencies (Bozkurt et al., 2020). The pertinent question to ask ourselves is when learners receive assignments from the instructors and submit the finished work through various platforms, did they do the work independently? Are the learners able to translate the theoretical concepts in the assignments into practical aspects and apply the skills in their daily lives?

3.5. ICT Competencies

ICT resources include but not limited to the following; tape slides, video recording, audio recording, simulations and still pictures. These resources have been found to increase learner performance since they break monotony and even improve creativity when using them (Karani et al., 2021). In the current generation and years to come, the use of ICT is key in transmitting expected competencies. Digital literacy during this time of the pandemic became a challenge for instructors who have been competent in face-to-face class instruction. In addition, learners got a challenge in using smartphones since most of them were not conversant with them.

4. Discussion and Conclusions

By embracing opportunities, ICT can be used to automate or replace routine tasks done by the teacher, for example, registering students for class attendance, delivering content to be learned by students, students' assessments. At the same time, teachers' professional development should be enhanced to allow retooling of TVET teachers in the use of digital tools to enable them to adjust in the teaching and learning process. The professional development for teachers should be a continuous programme to give support to the teachers as they adopt new ways of teaching. There have been outbreaks of different pandemics ranging from chronic to acute in every century and Covid-19 may not be–the last of the world's pandemic given that there is an evolution of viruses that cause diseases. However, for a country whose economy is growing, Kenya needs a gradual transition from physical to online learning by availing resources meant for instruction of vocational subjects. This calls for the government to ensure there is access to electricity and network coverage from urban areas to rural and even remote areas. This will help reduce the inequalities in education and ensure that no student is left behind in the learning process.

Some families may not manage to afford internet connectivity despite having access to electricity and this may necessitate the government to subsidize the internet data bundles. Institutions of higher learning may need to collaborate or are it with internet service providers to purchase internet and promote connectivity which will allow learners access e-platforms. How do we approach offering vocational subjects for nomadic communities through online learning? If we provide the communities with portable –solar charging devices will this make it easy for these communities to have their right to education fulfilled~~?~~ Right to education has not been achieved in Kenya especially in the marginalized communities due to inaccessibility to electricity, poor network, and frequent movement by pastoral communities. The learning environment which is key to learning may be a challenge where students' locality either home or community where the student is located becomes the classroom. This 'classroom' or learning environment is quite diverse and some students especially those from poor backgrounds may not have access to a suitable learning environment.

From the literature, most instructors not only in Kenya but also globally had concerns on how to promote online classes especially at the onset of the pandemic. The pandemic has however provided an opportunity for instructors to improve their digital literacy. Unfortunately, due to the pandemic, less privileged students dropped out of schools and others deferred their studies as a direct result of their inability to access ICT tools and associated tools.

5. Recommendations

The Kenyan government through the ministry of education may need to develop a policy framework guiding online learning and assessment of the competencies learned by students. Families with no ability to purchase ICT tools may be given the items on loans with no interest rates. Additionally, the TVETs may need to collaborate to have a joint platform for online materials since this will reduce the high costs associated with the maintenance of e-learning sites. Teachers and learners and other stakeholders in education-need to embrace the use of ICT in schools. This implies that the government needs to improve and/or implement the requisite ICT infrastructure that will enable seamless online teaching-learning for both the teachers and learners.

Declaration of Conflicting Interests and Ethics

The authors of this article do not have any conflict of interest and considered all the ethical issues.

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