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## CHALLENGES AND OPPORTUNITIES OF INCORPORATING DIGITAL TECHNOLOGY IN TEACHING AND LEARNING: THE COVID-19 EXPERIENCE

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### **Abstract**

The integration of digital technology in education has been a topic of great interest for education stakeholders for quite some time. Despite the push for teachers to incorporate technology in their classrooms, there has been some reluctance to fully embrace it, particularly in developing nations like Nigeria. However, the COVID-19 pandemic in 2020 brought to light the crucial role that digital technology plays in education. Teachers and students were compelled to heavily rely on technology to facilitate teaching and learning. While developed countries struggle to keep up with technology in education, developing countries face additional challenges due to a lack of infrastructure. Nigeria's educational institutions were found to be ill-equipped for the implementation of digital technology. This article examines the obstacles and prospects associated with the integration of digital technology in education, with a focus on the insights gained from the COVID-19 pandemic experience.

**Keywords:** Digital technology, COVID-19, teaching and learning, challenges, opportunities

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### **Introduction**

Traditionally, teachers and students relied on face-to-face communication and paper assessments. However, digital technology, including computers, mobile devices, projectors, and social media platforms such as email, the Internet, Google, and YouTube, has revolutionized education. Despite the challenges posed by the COVID-19 pandemic, it is clear that technology plays a critical role in enhancing teaching and learning. For education to keep pace with technological

advancements, it is necessary to fully integrate information and communication technology. Thanks to advancements in cellular technology and the internet, new educational opportunities have emerged (Panjaburee, 2018). Technology integration can take many forms, including presentation tools like PowerPoint, animations, videos, and simulations. Additionally, it can be used as a learning platform, such as Moodle, Blackboard, Rcampus, and other virtual learning environments. Technology can also facilitate distance learning through email, video conferencing, teleconferencing, Skype, and other synchronous and asynchronous communications.

Technology can enhance the relationship between teachers and students, when teachers effectively integrate digital technology into the subject matter it makes teaching and learning effective. Digital technology is a very powerful tool for education. It helps to connect with experts in another world; and provides meaningful contact between teachers and students working on the same activity out of school. It provides ways for students to view and build on the work of other groups or classes; and provides purposeful interaction between students and different schools' levels or classes across time frames and distance. It gives the facility for timely feedback from teachers and peers (Seechailo in Acharya, 2022). Digital technology allows teachers and students to improve engagement, and knowledge, encourage individual learning, and encourage collaboration, and it also helps the teacher with content delivery.

In the recent development of educational technology, most of the technology used in education is moving beyond normal classroom teaching and learning to virtual learning (Abbas et al., 2021). The use of learning platforms and communication tools becomes an important instrument for the effective implementation of learning flexibility among students and teachers.

In facilitating "anywhere anytime" learning opportunities for students, educational institutions need to develop strong and reliable e-learning systems (Sahito & Chachar, 2021). E-learning technologies support the following flexibilities: interactions and collaboration between instructor and students; location and time barriers between instructors and students, and delivery of instructional content (Sahito & Chachar, 2021). With the use of e-learning systems, teachers can use technology as a presentation tool, learning platform, and also a communication tool. Digital devices and applications are used to deliver the material in teaching and learning activities. Use of digital devices such as laptops, smartphones, teacher blogs, Kahoot! Edpuzzle and Padlet are very

supportive of student learning success (Argawati & Suryani, 2020). Digital technology should be used for self-learning, sharing-based learning, collaborative learning, web-based learning, and virtual learning in teaching and learning situations (Awasthi, 2020).

Although educators were highly encouraged to integrate technology in the classroom, teachers were sceptical to fully utilizing them (Ishak, Din & Othman, 2022). UNESCO (2013) reported that 80% of teachers in Malaysia used ICT less than one hour per week and mostly used it for word processing applications. Overall, 57% of teachers used technology for education and only 39% of them admitted to not receiving any training in using technology (Ebrahimi & Yeo, 2018). However, this situation drastically changed due to the Covid-19 pandemic outbreak in 2020. On March 26, 2020, UNESCO announced that 1.6 billion students from 165 countries were out of school (Wan, 2020). The Ministry of Education of the 165 countries decided to shut down school operations as a control measure to minimize the transmission of the virus

(Md Shah et al., 2020). The global spread of COVID-19 has led to the suspension of classes for more than 850 million students worldwide, disturbing the original teaching plans of schools in all countries and regions (Chen et al., 2020). Education leaders had to resort to multiple strategies and the most effective mechanism was to ensure learning continues with the use of digital technology.

The COVID-19 pandemic has significantly impacted the education landscape, resulting in a heightened dependence on technology for teaching and learning. With school closures, both educators and students have had to adjust to this new norm, relying on online teaching and communication platforms like video conferencing, Facebook, and Zoom as the primary means of delivering education. However, this shift has presented unique challenges for teachers, who must navigate coursework through online and remote learning. To ensure a successful transition, preparedness is essential in terms of technology, content, pedagogy, and home-based learning support, as well as monitoring and evaluation components (UNESCO, 2020; Hardman & Ntlhoi, 2021). This article offers valuable insights for education authorities and stakeholders on the opportunities and challenges associated with integrating digital technology into the teaching and learning process.

### **Challenges of Incorporating Digital Technology in Teaching and Learning**

It has been found by previous researchers that most students and teachers face similar challenges in using digital technology in teaching and learning situations. The following challenges are hereby discussed.

- 1. Internet connectivity:** Anwar et al. (2020) highlighted that students and teachers living in remote areas faced difficulties due to slow internet and connection problems, and people in towns also found it challenging to use digital technology. Babinčakova and Bernard (2020), Smith, Passmore, and Faught (2009), and Jindal et al. (2020) reported that the major challenge faced by both students and teachers is a slow and exorbitant internet connection which is the backbone of online education. 3G networking systems are not the same everywhere (Lembani et al., 2020). Connectivity issues were found to be a challenge during the implementation of online learning in developing countries (Aung & Khaing, 2015). It has been especially faced in non-urban areas of developing countries which results in longer waiting times and ultimately increases student's frustration and confusion (Rani, Kaur, & Sharma, 2022). Another study suggested that the technical issues, which are the key to the success of e-learning systems, indicate that 45% of e-learning projects in developing countries are complete failures, 40% are partial failures, and only 15% are successful (Al-Araibi et al., 2019).
- 2. Lack of Infrastructure:** The challenge associated with the use of digital technology in online learning is access to ICT resources, as e-learning thrives on the availability of ICT facilities (Arthur-Nyarko & Kariuki, 2019). There is an overloading of servers (Nikdel & Fardin, 2020) and a deficiency of other necessary infrastructure (Tadimeti, 2014; Babinčakova, & Bernard, 2020, Jindal et al., 2020, Mulenga, & Marbán, 2020) due to a premature shift to online education due to Covid-19. Moreover, most of the students cannot afford to purchase a desktop/laptop which is a requirement especially for practical/programming subjects for effective digital education.
- 3. Unfamiliar Technology and Resistance to Change:** Astuti and Solikhah (2020) found that online classes during the time of COVID-19 are not very effective because students are not familiar with digitalization. All the students and teachers are not aware of the latest technology. The main difference is the students' and teachers' willingness to accept and use the e-learning system to progress significantly (Almaiah et al., 2016). Reports indicated that obstacles to digital learning on the dimensions of teachers include lack of ICT expertise, lack of experience and knowledge about online learning, teachers who find it difficult to adapt to change, and development

of online learning programs that require a lot of time and lack of motivation (Gamdi & Samarji, 2016; Moscinska & Rutkowski, 2011; Sojanah et al., 2021). Furthermore, there is resistance to change from traditional teaching to online teaching/learning using digital technology (Jindal et al., 2020, Rani et al., 2022).

4. **Less Social Interaction:** Learners have a low level of engagement and interest due to the passive nature of the online lecture (Tadimeti, 2014; Babinčakova, & Bernard, 2020, Jindal et al., 2020). In traditional classrooms, the participants have the opportunity to collaborate and communicate with each other. They can share experiences, problems, support, and friendship (Smith et al., 2009) which helps them not only in real-life learning but also improves their mental and physical health. This is required for better personal and professional development. This opportunity is not there in digital classes. In nursing/medical education (Babinčakova, & Bernard, 2020) where it is required to have good communication between the staff and patients, social interaction becomes a mandatory requirement. Similarly, Soffer and Cohen (2019) highlighted that online education increases the dropout ratio of students in the learning process, which can be the cause of failure and social isolation of a learner and economic loss (Lee et al., 2013, Jaggars & Xu, 2016).
5. **Self-management of students:** In digital education, there is no direct control of teachers on students, so they need to be self-motivated and self-disciplined (Tadimeti, 2014; Jindal et al., 2020, Mulenga, & Marbán, 2020). Parents also need to play an essential role in making learners self-disciplined. Moreover, a proper environment needs to be provided during digital education so that learners can focus on their studies.
6. **Time:** Teachers need to restructure their lectures (Smith et al., 2009, Rani, et al., 2022) and there is no standard e-content available for online lectures. They need more time to prepare the lectures and materials. According to Delita (2021), the limitations in digital learning that may often occur include the need for careful planning. So proper preplanning is required.
7. **Evaluation and Credibility of Degrees:** According to Zulaiha et al. (2020), assessment is the core challenge in the online teaching and learning process. In online education, it becomes a challenge to evaluate (Smith et al., 2009) the students as teachers or Educational Institutes have no direct control over learners, especially in the scenario of Covid-19. Moreover, there are more

chances of fake degrees online, so it becomes a question of the credibility of degrees (Tadimeti, 2014). There is no immediate feedback, teachers cannot assess students' understanding during online lectures, students have limited attention spans and are intense toward online learning characteristics, which were supported by teachers that during online classes, students misbehave and attempt to access online resources during assessments (Mukhtar et al., 2020).

### **Opportunities of Incorporating Digital Technology in Teaching and Learning**

Despite of above-mentioned challenges, the world is adopting digital technology in teaching and learning. This is because of its opportunities i.e., flexibility in learning, cost-effectiveness, global exposure, better skills, and employability (Rani, et al., 2022).

1. **Flexibility in teaching and learning:** As online education is accessed from the Web, using digital resources, it is accessible anytime and everywhere where the Internet is available. Students need not travel long distances to study a course. Moreover, the students working or have other liabilities can continue their studies (Smith et al., 2009; Tadimeti, 2014; Rani, et al., 2022).
2. **Cost-effective:** Digital education is cost-effective (Smith et al., 2009; Karunanayaka, & Weerakoon, 2020) because students do not have to pay hostel as well as transport charges. Moreover, there is a lot of free E-content available on the Web. The government is also facilitating the same so that education can be reached by everyone.
3. **Improved Skill and Confidence:** There are numerous standardized courses available online and taught by knowledgeable and well-known educators (Mulenga, & Marbán, 2020). Now everyone has access to them which was not there in the case of traditional education (Rani, et al., 2022).
4. **Better Employability:** Digital education acts as a medium to bridge the gap between candidates and respective employers (Smith et al., 2009). There is an abundance of courses available on advanced technologies in almost every domain i.e., cloud, IoT, Big Data, software testing, hospitality, nursing, coding, and many more. Students can maintain their skills as per industry expectations (Rani, et al., 2022).

5. **Global Exposure:** Many reputed and prestigious institutions all over the world were earlier out of reach (Smith et al., 2009). It is because of their admission procedure and unaffordable nature (Rani, et al., 2022). Now they are offering online courses that are reachable as well as accepted by employers.
6. **Blended Model:** Nowadays, the blended Model is becoming popular in which students can benefit from Online learning as well as traditional teaching (Tadimeti, 2014). Both students and teachers need to be present and online teaching methodologies are blended into traditional methods (Rani, et al., 2022).
7. **Better impact on Health:** Teachers and students need not interact physically so there is no harm from infectious disease (Rani, et al., 2022). In this way, online teaching protects society from these kinds of diseases.
8. **More Productive Classes:** In traditional classrooms, teachers spend most of the classroom time controlling students (Rani, et al., 2022). However, in the digital learning environment, they can concentrate more on teaching learners.

## Conclusion

This study examines the opportunities and challenges that educators face when incorporating digital technologies into their teaching during the COVID-19 pandemic. The literature suggests that digital technology has become an integral part of education; however, it cannot entirely replace in-person teaching due to its role in the psychological development of learners. Despite this, online teaching has been the only feasible solution to ensure the safety of both students and teachers during this time. The use of digital technology in online education is gaining popularity due to the various benefits it offers. To maximize its effectiveness, all education stakeholders in Nigeria, including students, teachers, universities, polytechnics, colleges, and government, must collaborate to overcome the challenges highlighted in this research.

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