

Rapid review of the COVID-19 pandemic's impact on the digitalization of higher education

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Abstract

The digitization of the higher education process in the COVID-19 pandemic (new normal) has created a new technological wave. The COVID-19 pandemic (new normal) presents a great opportunity for higher education institutions (HEIs) to be digital and technologically innovative in their teaching and learning process through digitization. The process of digital transformation of the education system began long ago, but has been accelerated by the new normal created by the COVID-19 pandemic. Digital transformation in higher education institutions (HEIs) has become more intentional, in-demand, and purpose-driven. The COVID-19 pandemic revolutionized the higher education system and other areas of life. This paper examines the aspects of digitization of the higher education process in the new normal created by the COVID-19 pandemic era. This study presents a rapid review of the literature on the research topic. The changes brought about by the COVID-19 pandemic represent what is called the new normal (normality). The study found that the digitization of the higher education process brought accelerated, improved, consolidated, accepted, recognized, and accessible learning. Many digitalization tools such as social media, augmented reality, machine learning, and other emerging technologies are used to accelerate the higher education process during the COVID-19 pandemic (new normal).

Keywords: COVID-19 pandemic, Digital transformation, Digitalization, Higher education, New normal, Rapid review.

Introduction

The COVID-19 pandemic has brought significant changes to the higher education process, with many institutions shifting to online learning and digitalization of various processes (Keku, Asabea, Adu, Kodua, Patterson, Adu-Gyamfi, Adade & Aninakwa, 2022; Damkor, 2022; Hodges et al., 2020; Alqurashi, 2021). A rapid review of literature conducted by Berge and Huang (2020) found that the pandemic has accelerated the digitalization of higher education, and institutions have had to quickly adopt new technologies to maintain continuity of teaching and learning. With the need for physical distancing and lockdowns, institutions have been forced to rapidly adopt digital tools and online learning platforms to continue providing education to students. This shift to digitalization has brought both benefits and challenges to the higher education process. This rapid transition to digital platforms has brought challenges such as lack of access to technology and internet, as well as the need for faculty to rapidly adapt to new teaching methodologies (Hodges et al., 2020; Alqurashi, 2021). On one hand, it has enabled greater flexibility and access to education for some students, while on the other hand, it has exposed the digital divide and highlighted the need for technology access and faculty training.

The literature suggests that the digitalization of higher education has been driven by the need to ensure continuity of learning and teaching during the pandemic. Many institutions have adopted online learning management systems (LMS) and video conferencing platforms to deliver lectures and facilitate communication between students and instructors. The literature suggests that the use of LMS has been particularly effective in enabling remote learning, as it provides students with access to course materials, discussion forums, and assessment tools. This rapid review will explore the impact of digitalization on higher education in the context of the COVID-19 pandemic, examining the benefits and challenges of this transition.

1. Background of the study

The COVID-19 pandemic has had a significant impact on higher education institutions worldwide, resulting in a rapid shift towards digitalization of teaching and learning activities. Berge and Huang (2020) conducted a rapid review of literature to explore the impact of the pandemic on higher education and to identify the opportunities and challenges of digitalization in this context. The authors noted that the pandemic has forced institutions to adopt new technologies quickly, resulting in an accelerated adoption of digital technologies in higher education.

Digitalization in higher education has been a topic of discussion for many years, but the pandemic has accelerated the process significantly. In their review, Berge and Huang (2020) identified the challenges faced by students and educators during the rapid digitalization of higher education. These challenges included access to technology and reliable internet connectivity, which have highlighted the digital divide in higher education. The importance of digital literacy skills has also been emphasised in the context of the rapid digitalization of higher education. Al Lily et al. (2020) argued that students and educators need to be proficient in using digital technologies for teaching and learning. The authors suggested that institutions need to provide training and support to ensure that students and educators are equipped with the necessary digital literacy skills to succeed in the online learning environment.

In addition to digital literacy, the shift towards digitalization has also had an impact on assessment methods used by institutions. Berge and Huang (2020) noted that traditional assessment methods, such as exams and essays, may not be suitable for online delivery. Institutions have had to explore new ways of assessing student learning in the online environment, such as online quizzes and project-based assessments. Overall, the rapid digitalization of higher education in response to the COVID-19 pandemic has presented both opportunities and challenges for students and educators. Institutions need to provide the necessary support and training to ensure that students and educators are proficient in using digital technologies, and they need to explore new ways of assessing student learning in the online environment.

2. The digitalization of higher education during the COVID-19 pandemic (new normal)

The accelerated growth of technology and other digital tools in our world has made digital education, economy, society, and others possible (Bejinaru, 2019; Asaju & Ogar, 2022). However, HEIs should reassess their curricula in readiness for digital learning (Toquero, 2020) in the new normal. The new normal saw the opportunity for HEIs to upgrade their educational architecture to become more digital. The digitalization of higher education involves the process of adopting digital tools to improve and facilitate the teaching and learning processes. The digitalization of higher education presents new thinking and modernising education settings through technology. Danmuchikwali and Suleiman (2020) believe that digital education is technology-enhanced learning (TEL) created through digital innovation and resources. HEIs have long focused on mortar and brick in the delivery of the teaching and learning process through the face-to-face mode. According to Bejinaru (2019), the digitalization of education settings translates images, text, audio and video into digital format. The digital format is suitable for the COVID-19 pandemic (new normal) of education. The advent of the new normal created by the COVID-19 pandemic necessitated the ability of digital transformation in HEIs in revolutionising how teaching and learning are conducted. The process of carrying out digital education involves positive and negative aspects; however, digital transformation in HEIs has been slow. According to Rof, Bikfalvi and Marques (2022), digital transformation and adoption in HEI research before the COVID-19 pandemic show that digital tools play an important role in HEIs. The role of digitalization in HEIs can be underrated in the present dispensation because it changes how education is conducted. To achieve the digitalization of education, laptops, computers (desktops), smartphones, Wi-Fi connectivity (internet connectivity), cameras, printers, projectors, scanners and other tools are needed.

3. Research methods

This study adopted a rapid review in evaluating different aspects of digitalization of higher education processes during the COVID-19 pandemic (new normal). The COVID-19 pandemic (new normal) disrupted the education process and championed the digitalization process and the new way to conduct academic functions of teaching and learning. According to Tricco, Antony, Zarin, Strifler, Ghassemi, Ivory, Perrier, Hutton, Moher and Straus (2015), a rapid review is a type of 'knowledge synthesis' that involves parts of a systematic review to produce fast academic knowledge, while Moons, Goossens and Thompson (2021) believe that rapid review is an accelerated process of conducting a systematic review. The process of the rapid review follows the conventional systematic review, but omits some components to produce evidence research. A rapid review involves scientific knowledge based on existing literature through the process of establishing inclusion criteria, screening processes, data items/abstraction processes, and synthesis processes (ISDS). In this study, (1) the inclusion criteria process covers articles, books, and any scientific papers relevant to the study, (2) the screening process provides an overview of papers from 2020 to 2022 from scientific databases and related topic keywords, (3) data items/abstraction processes involve research papers with keywords such as digitalization of education

process, digital education, and other related words, (4) the synthesis process includes a search of the academic databases with recent papers covering the research topic; only papers published from 2020 upwards were considered. The considered papers were screened according to the topic, abstracts and introduction. The following were the research questions guiding the study:

- What are the most effective strategies for implementing digitalization in higher education during the COVID-19 pandemic?
- What are the benefits and challenges faced by institutions and students during the digitalization of higher education in the COVID-19 pandemic?
- What are the long-term effects of digitalization on the quality of higher education in the post-COVID-19 era?

This study omitted some traditional systematic review processes in adopting 'Search, Appraisal, Synthesis and Analysis (SALSA)' in drawing the conclusion on the digitalization of the higher education process during the COVID-19 pandemic (new normal). The SALSA process was combined with the ISDS process. The generated findings of rapid review can be trusted and used to make decisions as applied in the study.

4. Rapid review for answers to the research questions

This sections provide rapid review for answers to the research questions guiding the study in order understand the COVID-19 pandemic impact on the digitalization of higher education process.

4.1. The effective strategies for implementing digitalization in higher education during the COVID-19 pandemic

One effective strategy for implementing digitalization in higher education during the COVID-19 pandemic is the use of online learning management systems (LMS). According to a study by Hodges et al. (2020), LMS platforms provide a centralised location for course materials, communication tools, and assessments, allowing students to access learning materials and interact with their instructors and peers remotely. Another effective strategy is the use of synchronous and asynchronous teaching methods, as suggested by Al Lily et al. (2021). Synchronous teaching involves real-time interaction between instructors and students, while asynchronous teaching allows students to access materials and participate in discussions at their own pace and time. By using both approaches, instructors can provide a more personalised learning experience and increase student engagement.

One comprehensive strategy for implementing digitalization in higher education during the COVID-19 pandemic is to provide training and support to faculty and students to ensure they are comfortable with digital tools and can use them effectively (Mishra et al., 2021). This may include training on how to use learning management systems, video conferencing software, and other digital tools. Additionally, institutions should invest in technology and infrastructure to support digitalization, including providing access to reliable technology and internet connectivity for all students (Hodges et al., 2020).

Another effective strategy is to foster collaboration and interaction in online learning to promote student engagement and enhance the quality of learning (Jilani et al., 2021). This may include incorporating group work, discussion forums, and other interactive activities in online courses. Institutions should also establish clear standards for online education and ensure quality assurance processes are in place to monitor and maintain the quality of education (Dhawan, 2020). Finally, institutions should address the digital divide by providing access to technology and internet connectivity for all students, particularly those from low-income backgrounds or in remote areas (Hodges et al., 2020). This may involve providing laptops, tablets, or other devices to students who need them, as well as partnering with local organizations to provide internet access to students who may not have it at home.

By implementing these strategies, institutions can effectively navigate the challenges of digitalization and ensure that all students have access to high-quality education during the COVID-19 pandemic. Moreover, faculty development is crucial to the successful implementation of digitalization in higher education during the COVID-19 pandemic. In their study, Goh et al. (2020) suggested that institutions provide training and support for instructors to effectively use digital tools and incorporate them into their teaching practices. Providing technical support and access to resources is also essential to ensure that all students have access to the technology required for digital learning (Thakur & Srivastava, 2020).

4.2. The long-term effects of digitalization on the quality of higher education in the post-COVID-19 era

The long-term effects of digitalization on the quality of higher education in the post-COVID-19 era are still unknown, but there are some potential benefits and challenges that may arise. On the one hand, digitalization may increase access to higher education, particularly for students who face geographical, financial, or personal barriers to attending traditional

in-person classes (Garrison & Kanuka, 2004). This may lead to greater diversity in higher education and increased social mobility for disadvantaged students.

Moreover, digitalization may provide opportunities for more personalised learning experiences and greater flexibility in course delivery and scheduling (Crawford et al., 2020). This may allow students to learn at their own pace and on their own schedules, which may lead to improved learning outcomes and greater student satisfaction. On the other hand, there are also concerns that digitalization may lead to a decline in the quality of education and reduce opportunities for face-to-face interaction and collaboration (Daniel, 2018). Furthermore, the shift to online learning may exacerbate existing inequalities and widen the digital divide, particularly for students who lack access to technology or reliable internet connectivity (Crawford et al., 2020).

While the COVID-19 pandemic has accelerated the digitalization of higher education, it is important to consider the potential long-term effects of this shift on the quality of education. One potential benefit of digitalization is the ability to reach more students, particularly those who may not have had access to higher education due to geographical or financial barriers. Online learning can also provide greater flexibility in scheduling and personalized learning experiences, which may lead to improved learning outcomes and greater student satisfaction.

However, there are also concerns that digitalization may lead to a decline in the quality of education. One major concern is that the shift to online learning may reduce opportunities for face-to-face interaction and collaboration, which are important for building critical thinking and problem-solving skills. Additionally, some argue that online learning may lead to a commodification of education, where the focus is on delivering content rather than fostering meaningful engagement and dialogue between students and faculty (Daniel, 2018). Furthermore, the shift to online learning may exacerbate existing inequalities and widen the digital divide. Students who lack access to technology or reliable internet connectivity may be at a disadvantage, leading to disparities in learning outcomes and opportunities. Additionally, the lack of physical interaction and support structures may negatively impact the mental health and well-being of students (Crawford et al., 2020).

To address these challenges, institutions must invest in infrastructure and technology to ensure that all students have access to the necessary resources for digital learning. Faculty and staff must also receive training and support to effectively integrate digital tools into their teaching and ensure quality assurance processes are in place to monitor and maintain the quality of education. Overall, the long-term effects of digitalization on the quality of higher education in the post-COVID-19 era remain uncertain, and further research is needed to fully understand the impact of digitalization on learning outcomes, student engagement, and the quality of education. Institutions must carefully consider the potential benefits and challenges of digitalization and work to address these challenges to ensure that all students have access to high-quality education.

4.3. The aspect of digitalization of the higher education process

The COVID-19 pandemic has forced institutions to rapidly shift to digital learning, leading to both benefits and challenges for institutions and students. Digitalization has transformed and changed human society and created new skills, training, culture, and innovation (Bejinaru, 2019). The COVID-19 pandemic transformed social systems (García-Morales, Garrido-Moreno & Martín-Rojas, 2021), and education settings were not left out. The COVID-19 pandemic defined a dramatic shift in offering teaching and learning opportunities online to observe social/physical distancing and national lockdown (Rof et al., 2022). Before the COVID-19 pandemic, educators and learning institutions were reluctant to adopt and use digital tools in facilitating the teaching and learning process in higher education institutions (HEIs). The COVID-19 pandemic forced different institutions, including HEIs, to close their academic door to learning for some period, and online became an ideal platform. The COVID-19 pandemic disrupted and transformed the educational landscape (Iivari, Sharma & Ventä-Olkkonen, 2020). HEIs were forced to go digital (Rof et al., 2022).

4.4. The benefits in digitalization of higher education process

The digitalization of the higher education process became the norm across the world; however, many in developing countries found it difficult to adopt digitalization because of some internal and external factors such as a lack of access to electricity, internet access, policies, economic challenges and many more. The process for HEIs to continue teaching and learning is led by digitalization, which has become a normal process during the COVID-19 pandemic (new normal). According to Nesterchuk, Grishin and Chepurnaya (2020), the education process of digitalization during the COVID-19 pandemic (new normal) brings about an improved, accelerated, and consolidated distance learning process. Educators across the world now realise the opportunity and possibility of digitalization in the higher education process. The digitalization of the higher education process involves:

- **Transformation process:** Educational activities were deeply impacted by the new normal brought by the COVID-19 pandemic, which led to an immediate and swift move to online learning/electronic learning (e-learning) at HEIs

globally (García-Morales et al., 2021). The immediate swift made HEIs adopt online and other digital tools to deliver teaching and learning to students. The transformation brought by educational disruption breaks the traditional model of teaching and learning with the incorporation of digital tools. The digital transformation created by the COVID-19 pandemic (new normal) increased digital competition among HEIs in the quest to adopt digital tools to run their teaching and learning process (Rof et al., 2022).

- **Improved education process:** Before the COVID-19 pandemic, many were left out of the higher education system for various reasons such as limited facilities, and many others. Now, the digitalization of the higher education process improved the higher education process and access to millions and billions of students. The digitalization process in higher education breaks the education divide and exclusion and provided a better and quality education for many.
- **Accelerated process:** Digitalization of the higher education process during the COVID-19 pandemic (new normal) brought about faster access to educational resources and materials, as well as swift development and implementation of the robust online learning management system. Teaching and learning and library resources were moved online and increased bandwidth. According to Nesterchuk et al. (2020), before the COVID-19 pandemic, in Russia, the digitalization of the higher education process was slow and the COVID-19 pandemic made it mandatory for digitalization. However, digitalization processes make it easy for assessments to be conducted online fully and effortlessly. The digital acceleration process created by the COVID-19 pandemic (new normal) moved educational activities online (García-Morales et al., 2021), and made access to education easy and improved.
- **Personalised learning pace:** Learning is personal and students have different learning styles and abilities. The digitalization of the higher education process during the COVID-19 pandemic (new normal) made learning at HEIs personal. Learning content and materials are provided to students online and students are allowed to learn at their own pace and time. Learning materials and resources were organised in different formats such as text, audio, video, and animations. These formats gave students the opportunities to learn in their preferred format. Furthermore, because of the national lockdown in different parts of the world, students (learners) began to learn at ease in their own time and environment. However, students with appropriate digital skills have the opportunity to enjoy learning.
- **Consolidated learning process:** Learning during the COVID-19 pandemic (new normal) has become faster than before. Students are no longer restricted to four walls of learning. Through a consolidated process, learning materials were prepared in various formats as mentioned earlier. However, the digitalization of the higher education process during the COVID-19 pandemic (new normal) provided enough ground for blended and hybrid learning to co-exist. Access to learning is broken because students have a choice regarding the mode of learning (online or off-learning) and preferred learning format.
- **Accepted learning:** This is an information age and many students are digital natives. They have adopted technological tools in their daily lives; then, going digital in education was no longer a challenge. However, many in developing countries are still embracing digital penetration and its tools. According to Iivari et al. (2020), the current generation of people are born with technology. The adoption and usage of technology are part of their lives. Then, the digitalization of the higher education process during the COVID-19 pandemic (new normal) era was easier for them (students) to accept and adopt because of their familiarisation with digital tools and technologies.
- **Accessible learning:** One of the key benefits of digitalization is the ability to provide remote access to education, allowing institutions to reach a wider range of students who may not have been able to attend in-person classes. This can also lead to cost savings for institutions, as they may not need to invest in as much physical infrastructure (Crawford et al., 2020). The digitalization process breaks the digital and technological divides. Access to learning materials and content was easy because of high internet penetration, especially in the developed world. However, students in developing countries still struggle to accept, adopt and adapt to digital education as a result of different factors (challenges in digitalization of higher education process) restricting them. However, accessible learning platforms and materials were easier, platforms such as Zoom, social media, and others provided students with access to learning at their own learning pace and time.
- **Flexibility:** The digitalization of higher education allows for greater flexibility in terms of when and where learning takes place. Students can access course materials and lectures online, which means they can learn at their own pace and in their own time.
- **Cost savings:** Digitalization of higher education can be cost-effective for both students and institutions. It reduces the need for physical infrastructure, such as classrooms, and eliminates the need for travel expenses.
- **Accessibility:** Online learning can increase accessibility for students who may not have been able to attend in-person classes due to distance or disability. It can also provide more opportunities for non-traditional students who may have work or family commitments.
- **Personalisation:** Digital tools such as learning management systems (LMS) can provide personalised learning experiences that cater to the individual needs of students. LMS platforms can track student progress and offer personalised feedback to help students improve their understanding.

Institutions may also need to consider the long-term effects of digitalization on the quality of education, including potential impacts on student learning outcomes and engagement. Ongoing evaluation and improvement of digital learning practices may be necessary to ensure that the benefits of digitalization are fully realized (Crawford et al., 2020).

4.5. Challenges in digitalization of higher education process

The digitalization of higher education during the COVID-19 pandemic has both benefits and challenges for institutions and students. While digitalization has the potential to improve access to education and reduce costs, it also poses significant challenges related to technology access, engagement, and the quality of education. Institutions must work to address these challenges and invest in ongoing evaluation and improvement of digital learning practices to ensure that all students have access to high-quality education.

- **Skills and training:** At the beginning of the COVID-19 pandemic, those with limited skills and training were challenged to adopt and use digital platforms (Iivari et al., 2020). Inadequate skills and training challenged lecturers, students and HEIs across different countries to conduct online teaching and learning. The inadequacy of skills and training continues to hamper the digitalization of education during the COVID-19 pandemic (new normal). However, appropriate skills and training, as well as education necessitated the process.
- **Digital divide:** Digitalization can exacerbate the digital divide, as students from low-income backgrounds or in remote areas may not have access to the necessary technology, which can limit their ability to participate in online learning. The world system has embraced digital tools, but the digital divide still hampers access to technology for many, especially those in developing countries who are facing social, economic and political challenges. The wave of digitalization of the higher education process excludes them. In the COVID-19 pandemic (new normal), they were left out of the teaching and learning process for months without any interventions. As rightly captured by Lai and Widmar (2021), the digital divide seized opportunities for those without digital tools. Then, the digital divide should be addressed urgently (Litchfield, Shukla & Greenfield, 2021) to increase opportunities for millions to access and engage in digital education during the COVID-19 pandemic (new normal).
- **Resources:** The digitalization process of education in the new normal was hit by a lack of resources such as laptops, desktop computers, internet connectivity, network connectivity, computer labs, and many other resources, causing some schools and individuals to borrow laptops and other digital tools (Zalat, Hamed & Bolbol, 2021; Iivari et al., 2020). The online resources to conduct practical classes and activities were hampered in the new normal. The study by Mukhtar, Javed, Arooj and Sethi (2020) found that conducting practical and clinical work was difficult in the new normal (online). As we get normalised to the COVID-19 pandemic (new normal), the availability of digital resources and other essential resources must be intentionally provided to aid the digitalization of higher education in the new normal.
- **Adaptation:** Some lecturers (teachers) find the digitalization process in the higher education process during the COVID-19 pandemic (new normal) challenging because of a lack of skills, unwillingness and perception. The COVID-19 pandemic brought about the emergence of remote teaching mode (Nilsberth, Liljekvist, Olin-Scheller, Samuelsson & Hallquist, 2021). The adaptation of lecturers and students and HEIs at large was slightly challenging as a result of internal and external factors. The internal factors are internal processes such as policy, skills, training, timing, resources, willingness, budget and others; while external factors are somewhat intertwined with internal factors except for students' acceptability, readiness, culture, social and background factors, and many others. These factors made the adaptation to the sudden emergence of remote teaching and learning challenging and somehow impossible for many.
- **Distraction:** Learning requires good attention to be able to understand and interpret. The multitasking process between personal and academic was problematic for many to balance, which directly affects students' adoption of digital tools in learning during the COVID-19 pandemic (new normal). A study found that students were distracted from focusing attentively on online learning because many engage in other activities and their attention span was limited (Mukhtar et al., 2020).
- **Technical challenge:** The process of adopting digitalization brought by the COVID-19 pandemic (new normal) faces technical problems (García-Morales et al., 2021). According to Zalat et al. (2021), technical problems count among the highest challenges confronting digital education. The technical challenge was a result of a lack of skills and training on the side of lecturers and students in adapting to online learning modes. For a student with unsuitable internet connectivity and a lack of internet-enabled phones or smartphones, access to digital education is problematic and unreliable. However, technical support is necessary for the successful implementation of online education (Maatuk, Elberkawi, Aljawarneh, Rashaideh & Alharbi, 2021) during the COVID-19 pandemic (new normal).
- **Budget:** HEIs globally are challenged with limited budgets in carrying out their functions in teaching and research. The advent of the COVID-19 pandemic forced HEIs to invest in new and advanced technology and other digital tools. Out of their limited budget, many managed to invest, and others could not, because of a lack of enough funds to invest in a digital tool. Education funding in low and middle-income countries is low and the COVID-19 pandemic impacted the funds allocated to education (Al-Samarrai, Gangwar & Gala, 2020). However, financial support is essential in managing digital education (Maatuk et al., 2021).

- **Lack of face-to-face interaction:** Online learning can be isolating for students, and there is a lack of face-to-face interaction between students and teachers. This can affect the quality of learning and limit opportunities for collaboration and discussion.
- **Technological barriers:** Digitalization requires access to reliable technology and internet connectivity. Students from low-income backgrounds or in remote areas may not have access to the necessary technology, which can limit their ability to participate in online learning.
- **Quality assurance:** There is a concern about the quality of online education and the ability of institutions to provide the same level of support and quality of education as in-person learning.
- **Access to technology:** However, there are also significant challenges associated with digitalization. Many students face challenges related to access to technology and reliable internet connectivity, which can make it difficult for them to fully participate in digital learning. Additionally, the lack of face-to-face interaction can make it difficult for students to engage with their peers and instructors, leading to feelings of isolation and disengagement. Faculty may also face challenges related to adapting their teaching methods to a digital format and ensuring that students are effectively engaging with the course material (Almaiah et al., 2020).

These challenges can be overcome in the digital education process when it becomes clear that the COVID-19 pandemic (new normal) is here to stay. Then, all educational stakeholders must shift their ground and begin to adopt and accept the emergence of digitalization tools and other remote learning tools.

Despite these challenges, there are ways in which institutions can work to mitigate the negative effects of digitalization. For example, institutions can invest in technology and resources to ensure that all students have access to the necessary tools and infrastructure for digital learning. Additionally, instructors can work to create engaging and interactive online course materials and incorporate opportunities for peer collaboration and discussion (Almaiah et al., 2020).

5. Implications and going forward

The impact of the COVID-19 pandemic on HEI processes is notable and cannot be underrated. This rapid review study has managed to unpack the role and challenges of the digitalization process and transformation in the HEIs. Through this study, HEIs, lecturers, students and other stakeholders are equipped with different aspects of the digitalization of higher education during the COVID-19 pandemic (new normal). The process of achieving digitalization of education during the COVID-19 pandemic (new normal) provides the mechanism for educational institutions to compete nationally and internationally. HEI systems, lecturers, students and other stakeholders were not exempted from the disruption created by the new normal (COVID-19 pandemic).

However, HEIs must be intentional in moving into the transition to achieve an effective digital transformation of HEIs. Appropriate mechanisms and tools must be established across institutions, and lecturers and students must be equipped with the necessary skills and knowledge. This study serves as a reference point for academics and HEIs to understand the opportunities and challenges of digitalization of the higher education process in the new normal (COVID-19 pandemic) and set the pace for further research. Further studies should be conducted to evaluate the challenges that confronted HEIs in coping with the digitalization of higher education in the new normal (COVID-19 pandemic), as well as mitigation mechanisms.

6. Recommendations

- **Invest in technology and infrastructure:** Institutions need to invest in technology and infrastructure to support digitalization of higher education. This includes providing reliable access to technology and internet connectivity for all students.
- **Provide training and support:** Institutions should provide training and support to faculty and students to ensure they are comfortable with digital tools and can use them effectively.
- **Ensure quality assurance:** Institutions should establish clear standards for online education and ensure quality assurance processes are in place to monitor and maintain the quality of education.
- **Foster collaboration and interaction:** Institutions should incorporate opportunities for collaboration and interaction in online learning to promote student engagement and enhance the quality of learning.

7. Further research

- **Long-term impact of digitalization:** Research is needed to investigate the long-term impact of digitalization on higher education, including the effects on student learning outcomes, student engagement, and overall satisfaction.

- **Best practices for online learning:** Research is needed to identify best practices for online learning, including effective teaching strategies, student support services, and assessment methods.
- **Digital equity:** Research is needed to explore the digital divide and identify strategies for addressing it, including providing access to technology and internet connectivity for all students.
- **Faculty development:** Research is needed to explore effective strategies for faculty development in online teaching, including training, support, and incentives for faculty to develop and deliver high-quality online courses.

8. Conclusion

Digital transformation in the new normal (COVID-19 pandemic) at HEIs has come to stay. This paper was able to profile positive and negative aspects of digitalization in the higher education process in the new normal (COVID-19 pandemic). The continuous adoption and adaptation of digitalization in the higher education process must be intentional and championed by all stakeholders in the HEIs. The benefits include greater flexibility, cost savings, accessibility, and personalisation, while the challenges include a lack of face-to-face interaction, technological barriers, quality assurance concerns, and the exacerbation of the digital divide. Challenges persist in this transition process and continuous investment should be encouraged across the board for effective digital higher education transformation to be achieved.

To address these challenges and fully realise the potential benefits of digitalization in higher education, institutions must invest in technology and infrastructure, provide training and support, ensure quality assurance, and foster collaboration and interaction. Further research is needed to investigate the long-term impact of digitalization, identify best practices for online learning, address digital equity, and develop effective faculty development strategies. Going forward, researchers should investigate how HEIs have managed to sustain the digitalization process during the COVID-19 pandemic and the challenges encountered. Furthermore, studies should be done to determine the impact of the digital divide, financing (budget), resources, skills and training, technical challenges, and other factors in HEIs carrying out the digitalization process. Other related studies are essential to understand the impact of digitalization transformation during the COVID-19 pandemic and post-COVID-19 pandemic era. Overall, digitalization has the potential to transform higher education, making it more accessible, flexible, and personalised. However, institutions must be mindful of the challenges and work to address them to ensure that digitalization benefits all students and faculty.

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