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Online Learning by University Students for Improved Performance in Emerging Economies: A Systematic Literature Review

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Abstract

The main purpose of this study was to investigate the uptake of online learning as a new normal by university student for improved performance in emerging economies. Objectives of this study is to determine the uptake of online learning by university students, establish effect of online learning on university student performance, and to develop a framework that promote the uptake of online learning by university students in improving their performance in emerging economies. Emerging technologies and practices, such as online learning, are reported and predicted to have the potential to influence the future of global higher education teaching and learning. Lecturers and students in emerging economies contexts are less familiar with the use of digital technologies and had to struggle hard due to the lack of proper training and skills to utilize digital technologies which are inevitable for online learning, be it synchronous or asynchronous. A systematic literature review approach was used. 219 articles were found in the Scopus database, 69 papers were selected for the study. Results showed that online learning has bought positive impact on the lives of students in improving their academic performance for universities in emerging economies. There has been limited research into the use of digital technologies and their effects on student engagement and performance in emerging economies context. The present study was therefore designed to address this gap by focusing on the use of online learning by establishing various digital tools and their roles in fostering students' online performance. This study therefore recommends a framework that promotes the uptake of online learning by university students in improving their performance in emerging economies through the four pillars of legislative framework, online leaning platforms, infrastructure, and human capital. The theoretical findings of this study therefore offer insights on policy implications for online learning practitioners and policymakers.

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Introduction

The disruption caused by Covid-19 has pushed academic institutions to focus their efforts on facilitating a swift, rapid, and unexpected transition to online education and assessment (Li, 2022). Online learning is defined as a type of e-learning which is the process of acquiring knowledge using electronic technology (El Mourabit et al., 2023). The result of these efforts is a substantive rise in e-learning, whereby teaching and learning activities are taking place remotely via digital platforms. Across the world, existing lockdowns exposed some inequalities and challenges for equal education access, especially in emerging economies (Oyedotun, 2020). During the outbreak of the COVID-19 pandemic, the abrupt shift of teaching and learning activities from the physical classroom setting to an emergency online learning environment had a significant impact (Tan et al., 2022) on student performance.

Emerging technologies and practices, such as artificial intelligence, micro-credentialing, blockchain and open educational resources, are reported and predicted to have the potential to influence the future of global higher education teaching and learning. However, a full understanding of how these technologies can be applied to facilitate teaching and learning is still lacking (Salman & Soliman, 2023). While engaging students in physical classes remains a challenge, engaging them online becomes even more challenging since online learning occurs at different times and spaces without a real sense of face-to-face interaction (Rafique, 2023). Besides, the teachers and students in emerging economies contexts that are less familiar with the use of digital technologies had to struggle hard due to the lack of proper training and skills to utilize digital technologies which are inevitable for online learning, be it synchronous or asynchronous (Rafique, 2023).

The sudden transition to online pedagogy as a result of COVID-19 in emerging ecomomies has exposed some inequalities and challenges, as well as benefits. The lack of participation and responses from the students was also mentioned as a challenge which made it difficult to know how effective classes were in online environments (Khan et al., 2020). These challenges and inequalities have now become the new realities in the educational sector of (Oyedotun, 2020) for emerging economies. Present researchers' observation and experience established that online learning is not implemented effectively in universities for emerging economies even at the postgraduate level. This is because online learning is in the early stage of the emerging economies education system. In line with this, poor internet access and students' internet skills deficiency are the major challenges to using the internet for universities in emerging economies (Endris & Molla, 2023). These problems affect the effective implementation of online learning and student performance.

In addition to these problems, the sudden transition from face-to-face to online instruction might have resulted

in an entirely different learning experience for students. Lack of preparation and planning also affects the practice of online instruction (Atmojo & Nugroho, 2020). Although various studies have been conducted related to online learning, only a few studies have investigated the students' perceptions and practices of online learning and their performance. For instance, (Kulal & Nayak, 2020) conducted their study on the perception of teachers and students toward online classes in emerging economies, and the findings of the study showed that students have positive perceptions toward online learning classes which subsequently improves their performance. Thus, the main purpose of this study was to investigate the uptake of online learning as a new normal by universities for students' performance in emerging economies.

Recent research Oyedotun (2020) has emphasized the multifaceted benefits of the use of technologies in online classes and offered various strategies to employ in online learning environments. However, there has been little research into the use of digital technologies and their effects on student engagement and performance in emerging economies context. Available studies reported mostly on the constraints of online learning e.g (Nusrat, 2021; Shrestha et al., 2022) and a planned implementation and evaluation of using digital technologies. This gap in research necessitated investigation into the ways digital technologies such as online learning can be utilized in emerging economies contexts to enhance student performance. The present study was therefore designed to address this gap by focusing on the use of online learning by establishing various digital tools and their roles in fostering students' online performance by proposing a framework for online learning for university students in emerging economies. The following are therefore the study objectives; 1) determine the uptake of online learning by university students in emerging economies, 2) establish the effect of online learning on university student performance in emerging economies, and 3) to develop a framework that promote the uptake of online learning by university students in improving their performance in emerging economies. The next sections will discuss the literature review methodology, results, discussions, conclusions, and recommendations.

Literature Review

Virtual learning has been christened with varieties of names among which are online learning (Shahzad et al., 2021), distance learning, e-learning (Harsasi & Sutawijaya, 2018) and remote learning. The belief is that online learning should ameliorate some of the difficulties posed by the COVID-19 pandemic to the teaching and learning process. This medium of learning was favored because it does not require physical contact. It provides teachers and students the opportunity to achieve what traditional face-to-face teaching and learning mode does. According to (Hettiarachchi et al., 2021), virtual learning is the only medium in the contemporary world where seclusion is prioritized over socialization. The education sector has not been immune from the impact of COVID-19, as it has affected all levels of global education systems from the pre-school to the university and has also caused cancellation or postponement of academic conferences. Therefore, teaching and learning approaches have changed dramatically since the COVID-19 outbreak on (Tan et al., 2022).

Conceptualising Online Learning

Online learning (OL), also known as 'e-learning', refers to the teaching and learning online where interaction between learners and the instructor is mediated by technology and the design of a learning environment (Patricia Aguilera-Hermida, 2020). Online learning is the delivery of instruction to a remote audience using the Web. Fry (2001) also defined online learning as the use of the Internet and some other vital technologies to develop materials for education purposes, instructional delivery, and management of programs (Fry, 2001). Online learning refers to as the use of the Internet to access learning materials; interact with the content, instructor, and other learners; and to obtain support during the learning process, to acquire knowledge, construct personal meaning, and grow from the learning experience (Endris & Molla, 2023). The above definitions indicate that accessibility, flexibility, and interaction are the main components of effective online learning.

Approaches To Online Learning: Synchronous and Asynchronous

Synchronous online learning refers to live online lectures requiring students to attend the lesson in real time. Lecturers or instructors and students join in a common place real-time situation (Alzahrani et al., 2023). Synchronous learning is also supported on the virtual podium where cooperative learning occurs; instructors interact with learners through video conferencing, live chatting, live streaming, etc (Teng et al., 2012). On the other hand, asynchronous online learning uses recorded lessons uploaded by instructors to be retrieved by students at their convenience (Alzahrani et al., 2023). While the asynchronous online learning approach enables students to learn with flexibility at their own pace and comfort zone, synchronous online learning encourages students to get engaged with asynchronous activities (Fernandez et al., 2022). This shows that online classes are student-centered, which offers more flexibility for students to work cooperatively and therefore increase their performance in emerging economies. That is, there is an active involvement of students in the process of online learning, particularly in the synchronous approach which poses a challenge for emerging economies because of challenges such as network connectivity, power outages, and digital divide.

Tools Used for Online Learning

Digital technologies are inevitable for online teaching and learning as it entails both synchronous and asynchronous modalities (Rafique, 2023). Within days of the directives, many educators and colleagues at the university started exploring all forms of available video-conferencing applications and platforms (Oyedotun, 2020). Forms such as GoToMeeting, Skype, WhatsApp, ezTalk, emails, BlueJeans, and Zoom were used in addition to the Moodle platform used by some universities in emerging economies. Based on the relatively positive experience of many colleagues with the use of the, the universities purchased Zoom Enterprise versions for use by lecturers and with the help of their University's Software Department, this can be integrated into the university's learning platform, Moodle (Oyedotun, 2020). Rafique (2023) argued that creating a virtual learning environment (VLE) using learning management systems (LMSs) such as Canvas, Blackboard, Google Classroom, and Edmodo is beneficial as these contain individualized student and staff entry portal, message board, discussion forums, sections for course information, timetables, and learning resources. Various

collaborative technologies can support learning including G Suite applications such as Google Docs, Slides, Forms, Jamboard, Sites, and Blogger, Microsoft applications, and Web 2.0 tools such as Padlet, Nearpod, Stormboard, Socrative, and so on. Such technologies offer various features for participation and interaction between and among its users. In general, the online learning process is influenced by various sociocultural factors related to universities, online learning platforms, peers, and lecturers. Thus, students can learn and interact with instructors and other students online wherever they want (independently) (Singh & Thurman, 2019), and instructors act as facilitators. In many platforms, embedding videos, audio clips, or external links provide access to a wide range of content and materials. Alongside, using wikis or blogging sites as LMS can be effective yet low-cost implementation. These platforms assist in enhancing student performance as these sites generate lot of interest among students.

Theoretical Framework - Models of Online Learning

The models in Table 1 below have been used in this study to inform the proposed online framework for university students' performance in emerging economies and their explanation is highlighted.

Table 1. Models of technology

Model	Explanation
(Garrison et al., 2000) 'community of learning' model	The model confirmed the value of using technologies that are pedagogically and structurally modelled. They referred to creating a cognitive, social, and teaching presence for deep and meaningful learning in online environments.
Technology Acceptance Model (TAM)	TAM proposes that perceived ease of use and perceived usefulness of technology are predictors of user attitude towards using the technology, subsequent behavioral intentions, and actual usage (Masrom, 2007).
(DeLone & McLean, 2003)	DeLone and Mclean Success Model proposed in 2003 incorporates six interrelated components of information success achievement: system quality, net benefit, information quality, user satisfaction, service quality, and use.

In the past years, it has been noted in different related research that learners have difficulty understanding chemical nomenclature and chemical formula writing. In the investigations done by Savoy (1988) and Hines (1990), it was shown that learners struggle to write chemical formulae. If learners are not able to fully understand chemical formula writing and naming, the tendency is that they will be hard up in learning concepts related to stoichiometry, chemical reactions, and balancing equations among others. This is supported by the findings of Lazonby, Morris, and Waddington (1982) in their research that learners' failure to accurately write chemical formulae is linked to their ongoing struggles in solving problems concerning stoichiometric calculations. Furthermore, in the series of tests conducted by the West African Examination Council (WAEC), the association responsible for establishing examinations in West Africa, it was revealed that many of the test

takers in 1995 and 1999 had problems in naming inorganic compounds systematically and generally cannot give the IUPAC names of selected ionic compounds (WAEC, 1995 & 1999).

Since learners have issues with naming inorganic compounds, this has led to their incapability to accurately write chemical formulae (WAEC, 1994; WAEC, 2001; WAEC, 2004; & WAEC, 2005). Similarly, Baah and Krueger (2012) tested 334 senior high school students in terms of their ability to name and write the chemical formula of ionic compounds. Their study determined that students have trouble in naming and chemical formula writing and that they lack understanding of the meaning of the Roman Numeral in brackets and the role of valency in writing chemical formulae. In addition, Naah and Sanger (2012) explored learners' alternative conceptions of stoichiometric equations for electrolyte solutions.

One of the results of the study shows that among the 37 college students who participated in the semi-structured interview, there are students who exhibited confusion on how to properly use subscripts and coefficients. Confusion about the use of subscripts concerning simple compounds containing polyatomic ions was also documented by Habiddin (2014). Related to this, Habiddin (2014) also noted that learners tend to misname compounds with radicals because they fail to memorize the names of polyatomic ions. Espinosa et al. (2016) also recorded a misconception among learners in writing chemical formulae regarding putting charges to supposed to be neutral species. While students show difficulties in naming compounds and chemical formula writing, it is also good to point out that one of the results from the study of Amazona, Jr., and Vallejo (2020) shows that the student's performance in writing formulae is categorized as "nearly proficient". It appears that the students quite easily remember how to write chemical formulae.

Given the past and recent studies, it is important to note that students have difficulties in chemical formula writing and naming ionic compounds. Thus, this study is formulated to understand the misconceptions related to the difficulties of General Chemistry 1 learners in formula writing and naming ionic compounds. This present study is also considered worthwhile because it appears that little research has been done in this area. The following questions are used in conducting the study: (1) What are the students' misconceptions about formula writing and naming ionic compounds? and (2) What are the challenges of the students in formula writing and naming ionic compounds and how do they address these challenges?

Method

For this study, a systematic literature review approach was used to unpack issues pertaining to online learning on and its effect to university student performance in emerging economies. PRISMA framework was therefore used to perform the systematic review analysis, which seek to discover, assess, and synthesize the findings of all relevant individual research on online learning, student performance, universities, and emerging economies topics. Scopus database was utilised to search for relevant journal sources which then was evaluated in relation to the study objectives. The definition of the search terms served as the basis for the research. The adopted

strategy to search and select the articles included in the review was defined using the following queries in Figure 1 below, the search string was restricted to Title, abstract and keywords.

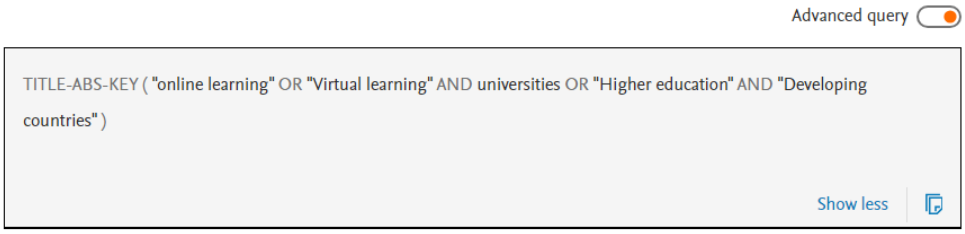

Figure 1. Search queries

The study utilized a two-tier test to gauge the performance and misconceptions of the Grade 11 learners in formula writing and naming ionic compounds. The top 10 and bottom 10 learners have undergone an interview to dig deeper into their reasons or conceptions for answering the questions in the test. The students were asked about their challenges or difficulties in answering the test and how they addressed them. The interview followed the interview protocol prescribed by Creswell (2009). After the collection of data, the gathered sets of information are summarized, taking into consideration the students' misconceptions, reasons, and processes to systematically interpret the results and understand misconceptions of students on formula writing and naming ionic compounds.

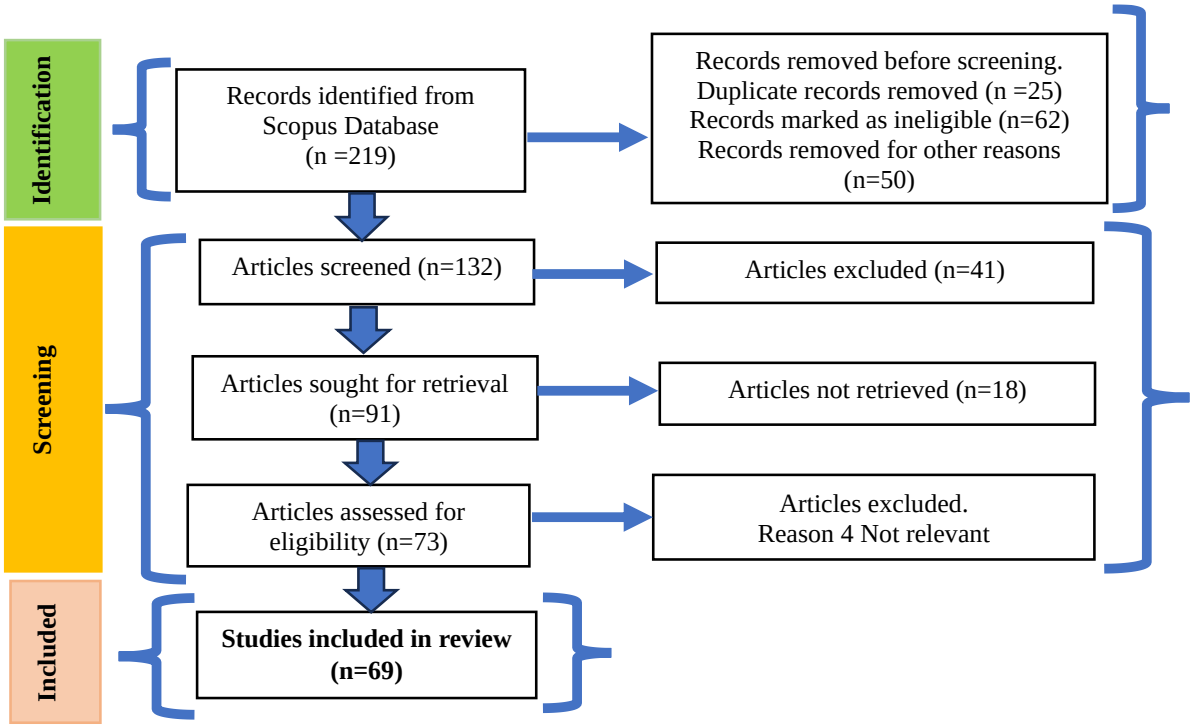

Figure 2. Systematic literature review process

Results and Discussion

This study decided to adopt some inclusion criteria to refine the sample. Only articles and reviews, papers

written in English and only articles and reviews published between 2018 and 2023 as shown in Figure 3 below. The search was from all subject area documents of type- Article, review and article in the press were selected. Articles with no access to their full text were excluded. Initially, 219 articles were found in the Scopus database. The duplicate articles were removed, which led to only 132 articles left out. Now 91 articles were screened thoroughly by the authors and left with 73 articles, and 69 papers were selected for the study, which aligns with the research objectives of determining the uptake of online learning by university students in emerging economies, 2) establish the effect of online learning on university student performance in emerging economies, and 3) to develop a framework that promote the uptake of online learning by university students in improving their performance in emerging economies.

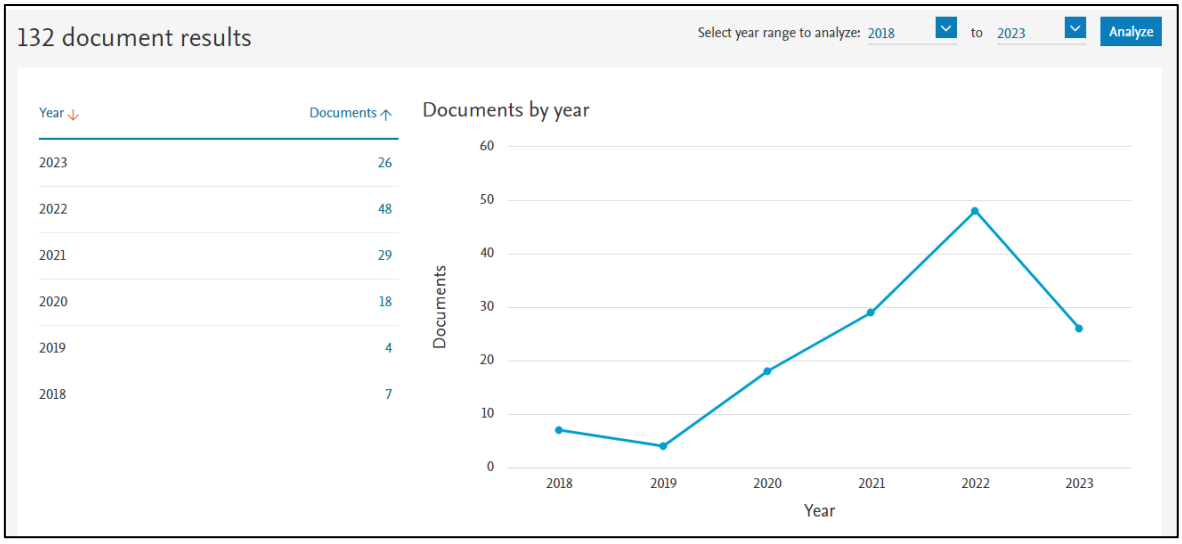

Figure 3. Screened Articles

Challenges of Online Learning for University Students in Emerging Economies

This study established that online courses might be completely or partially inaccessible to the students in emerging economies due to a poor internet connection and in many cases students may stay logged out (Mohamed Abd El-Hamed Diab & Fouad Elgahsh, 2020; Sangster et al., 2020). In emerging economies, several students, especially those who are living in rural and underprivileged areas do not have access to sufficient and efficient internet connection, which leads to several problems in their education. Figure 4 below.

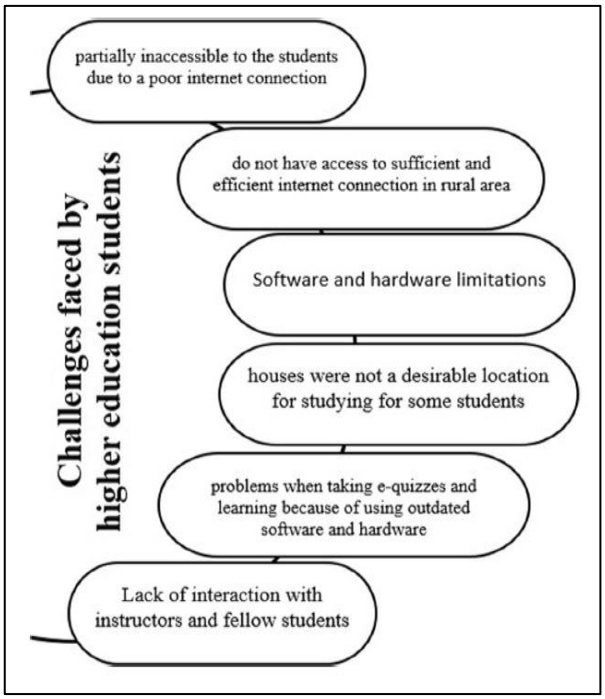

Figure 2. Challenges faced by students (Zarei & Mohammadi, 2022)

Table 2 below shows some of the challenges of online learning for students in emerging economies. These challenges inform the appropriate online leaning framework for universities in emerging economies for this study.

Table 2. Challenges of online learning

Nature of challenge	Explanation	Author
Lack of resources	• Unavailability of computers, laptops and/or tablet facilities for students to use in connecting to the online mode.	(Oyedotun, 2020)
Course delivery problems	• Reduced student–teacher engagement: As can be noted in some of class experiences while teaching, many students no longer engage in class discussion as they do in the traditional face-to-face class and there is often little or no feedback when questions are asked. • Slow and extended work: Students are unable to submit assignments when due, lecturers are unable to keep up with their schedules because of either power-cuts or internet problems. • Compromise with deadlines: On many occasions where students and staff were unable to use technological tools to get work done in a timely manner, they were compromising with deadlines and even with the standard expected of their delivery because of	(Lavy & Naama-Ghanayim, 2020; Orkibi & Tuaf, 2017) (Oyedotun, 2020). (Tan et al.,

	other constraining factors they are confronted with.	2022)
	• The disadvantaged students preferred recorded lectures as the content delivery method, and they perceived their groupmates as supportive in their learning activities.	(Oyedotun, 2020)
	• Malpractices: With the online method of testing and the realities of many students' inability to utilise video services during some live class exercises and tests because of the limitation of the technological devices, students could receive assistance and help that the instructor may not be privy to	
	• Students' inflexibility: Many students who were accustomed to the traditional face-to-face method of teaching found the online method burdensome, with some becoming rude and impolite to lecturers because of the stress experienced as a result of adjusting to online education.	
Problems facing students	• Domestic affairs: The online delivery mode forced many students to be working at home where they are under enormous distractions and other domestic issues and as such, most students found it challenging to maintain focus during online teaching	(Sutton et al., 2020); (Oyedotun, 2020).
	• Mental health challenges: Fear and anxiety surfaced among some students as a result of the sudden change.	
Cybersecurity problem	• With computers and other portable technological devices being entrenched in our daily educational and teaching lives driven by the migration of traditional learning to online mode, there abounds various kinds of breaches, exposure to viruses, hacking potentials, and other cybersecurity threats.	(Nam, 2019)
	• The term "digital divide" refers to the disparity between those students who have and those who do not have access to computers and internet.	(van Dijk, 2006)
Digital divide	• Generally, digital divide poses a threat to students for epistemological access. Firstly, poor digital, computer, and internet access affected student learning opportunities and outcomes.	(van Dijk, 2006)
	• Geographical divisions affected digital access. A negative correlation between rural dwellers and the internet access was reported in the literature, highlighting the struggle of students in rural areas.	(Lai & Widmar, 2021)
	• These students are more likely to lack necessary resources for academic achievement.	
Poor	• Slower internet speed at home due to sudden and unprecedented	(Oyedotun,

infrastructure	internet traffic, and the lack of preparedness of internet providers for the sudden enormous demands on their services • Inconsistent power supply: Unlike the developed countries, universities in emerging economies are yet to guarantee a stable power supply as there are occasions of power-cuts during the delivery of lectures, affecting both students and lecturers especially in countries like south Africa, Zimbabwe and other countries.	2020).
Lack of training of lecturer on the use of online platforms	• The study reveals that students are comfortable with online classes and are getting enough support from teachers but they do not believe that online classes will replace traditional classroom teaching. • It also finds that teachers are facing difficulties in conducting online classes due to a lack of proper training and development for doing online classes. • Technical issues are the major problem for the effectiveness of the online classes.	(Kulal & Nayak, 2020).

Can Online Learning Improve Student Performance?

This review established that online-based teaching and learning is interactive (Citation: Johnston et al., 2005) and online teaching creates environments where students actively engage with the material and learn by practical activity and also refers to their understanding as they build new knowledge thereby improving their performance. Effective online engagement requires certain key components. Engaged students are attributed to have positive attitudes toward their peers and be more active in their effort in learning thereby improving their performance. Interaction has a key role here as (Muirhead & Juwah, 2005) argued that student-student interaction promotes inter-and intra-peer collaboration. Since students may lack "self-monitoring skills required for the online environment", they need more academic and peer support to excel academically. This study found out that the role of online lecturers is also crucial because they help learners become self-directed and more active in learning, thereby increase their academic performance. In a similar vein, Czerkawski and Lyman (2016) proposed an instructional design framework to foster students' online engagement which includes performing needs analysis, defining instructional goals and objectives, and developing learning environments. Building a community of learners in an online environment where a sense of trust and safety exists between its participants is important for increasing university student performance in emerging economies as illustrated in Figure 5 below.

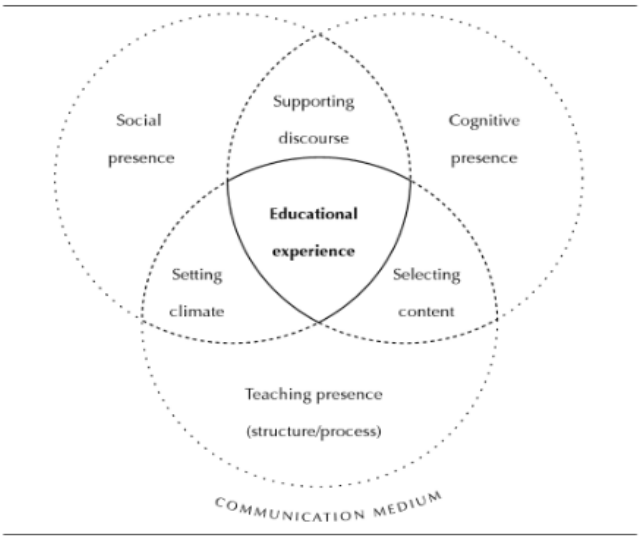

Figure 3. Community of inquiry

This study established that the most important measure of the effectiveness of teaching and learning activities is students' satisfaction, irrespective of where the learning activity takes place and when and how it is organized. To achieve this (satisfaction) as a measure of effectiveness, the lecturer has a key role to play in higher education. (Hettiarachchi et al., 2021) asserted that satisfaction can make the academic performance of students better, improve the online teaching and learning itself and encourage students to remain in the program. In the same vein, (Topala & Tomozii, 2014) described online learning satisfaction as the general feeling of students toward online teaching and learning processes and this has a direct influence on student performance.

Further, the finding that they learned new things through their overall use of technologies seems to support (Oyedotun, 2020) findings which affirmed that engaging in online learning led to personal development and growth of students. This can suggest that adult learners learn better when they take responsibility for their learning. It might be assumed that the activities using digital technologies required them to think, create, and contribute which led them to experience a better learning environment and enjoy participating and collaborating with peers thereby increasing university student performance in emerging economies.

Moreover, Oyedotun (2020) findings described how digital inequalities and even access to devices affected students' online participation. Since many students reside in rural areas in the researched context, it may be assumed that they have limited access and connection to the internet which seems to affect their active participation and interaction in synchronous sessions as well as responses in latter activities in asynchronous sessions. Further, students and the teacher's data regarding pre-tutorials of technologies seem to differ (Rafique, 2023). One feasible interpretation could be that the lecturer misinterpreted students' needs for digital skills whereas ensuring digital skills in tech-mediated learning is a key element. This mismatch in perception and the need for proper orientation are also reported in the studies by (Mannan et al., 2020), which can subsequently affect the student performance.

Figure 6 below indicates the most common online tools used by universities in emerging economies.

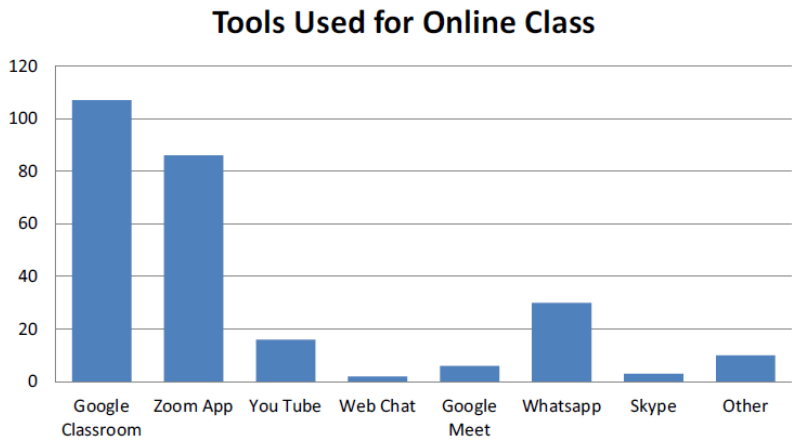

Figure 4. Tools for online class (Kulal & Nayak, 2020)

The study found out that google classroom and zoom application are the most commonly used online tools in emerging economies. The study established that google classroom is created by google which is a free website service that focuses on the distribution and grading of assignments for educational institutes. Its basic purpose is to smooth the process of sharing documents between students and teachers (Hilal et al., 2022). On the other hand, the study established that Zoom is a web-based application in which live video broadcast is used by many teachers for delivering their lectures effectively. This meeting event is organized by one host and other participants have equal footing. Similarly, the host of the event can allocate responsibilities of hosting with other participants of the meeting and participants can easily share the display with the meeting participants (Hilal et al., 2022).

The study review also found out that the sensing presence of users to different social networking applications, for example, Myspace, Skype, and Facebook with implicit communication and a new intensity of connection to the friends on social network platforms. This system is enabled on sensor-enabled and standard number mobile phones which is also being used in emerging economies. Its services are enabled on the basses of per buddy for the user's exposure to a different degree of sensing a presence. The system services consist of friends feed, social interaction, buddy search, my presence, buddy beacon, and significant places (Chen & Rahman, 2008). Google Classroom and Zoom meetings had secured solid positions in the field of online studies in the period of COVID-19. They both have a user-friendly environment for their customers and are easily accessible by a user, but the zoom application had a less quality mobile app which creates problems for the users at some point. Zoom application offers a wide variety of meetings settings for the users which make their work easy and more effective communication between the students and teachers. But on the other hand, google had a more efficient setup of sharing documents, assignments, and grading policy which creates opportunities for the students and teachers to keep track of their files (Hilal et al., 2022).

Benefits of Online Learning

Table 3 below illustrates the benefits of online learning for university students and lectures in emerging economies.

Table 3. Benefits of online learning

Benefit of online learning	Author
• Studying anywhere and anytime, having more time for thinking and feedback and increasing flexibility in learning. • Allows learners to become more active participants in the learning process regardless of the size of the classroom or the time. • The ability for students to employ self and personalized learning as well as to select their own learning environments. This helps to meet the needs of students and outperforms traditional learning.	(Endris & Molla, 2023)
• Cost-effective compared to traditional learning as a cheap mode of education that helps students improve their technology skills. • Offers the possibility of cross-access the global gap in education, can help students living in areas where infrastructure, such as roads or suitable transportation, is lacking, and can reduce travel expenses. • E-learning eliminates the geographical barriers and time scale that are often associated with traditional learning.	(Bączek et al., 2021; Johnson et al., 2021)
• Learners can control their own learning pace, and activities can be flexible according to students' learning styles.	(Clarke & Hermens, 2001)
• Online learning can create a suitable learning environment for instructors and students; using authentic learning materials like videos and other multimedia.	(Halim & Hashim, 2019; Pazilah et al., 2019)
• Online learning is beneficial to create a digital learning community, improve students' digital learning skills and stay connected during tough times like COVID-19. • Online education presents a long-lasting solution to the constant interruption of university education in developing countries like African countries.	(Ajibo & Ene, 2023; Li, n.d.-b)
• Flexibility and self–control within the learning environment, and they also perceived that online class would be a convenient method of teaching compared to traditional classroom learning.	(Kulal & Nayak, 2020)
• It fills the gap of literacy rate by reaching to the rural areas	(Bordoloi, 2018)

Conclusions

Research on online learning has decreased in 2023 as compared to 2022 when cases of Covid-19 was at peak world over. Online learning is an exciting new way to learn about almost anything and therefore its research should continue despite the low rate of reported cases of Covid-19. Online learning has bought a positive impact on the lives of students in improving their academic performance as well as lecturers at universities in emerging economies. The increasing use of technology in the field of learning has improved the quality of education in emerging economies. Both students and lecturers have optimistic views about online classes. However, there is always much room for improvement as far as online learning goes (Kulal & Nayak, 2020).

The sudden transition to online pedagogy education as a result of COVID-19 in emerging economies has exposed some inequalities and challenges as well as provided some benefits (Oyedotun, 2020). Despite the positive experiences, the findings revealed certain constraints that seemed to affect students' online engagement and their performance in emerging economies. Technical aspects have been a key challenge which could be the reason for students' reduced participation and engagement might be affected due to the contextual factors. The issue of unreliable network and connectivity has been reported in numerous findings, which seemed not only a contextual issue but also a concern in emerging economies Moreover, (Oyedotun, 2020) findings described how digital inequalities and even access to devices affected students' online participation and their performance in emerging economies.

Recommendations

The findings of the study showed that synchronous online learning has not been implemented properly yet; it is likely to conclude that there is a discrepancy between the student's perceptions and actual practices. The migration process of the universities to online instruction without adequate planning and designs and students' lack of awareness on how to use online learning technologies might be among the major factors that affect the effective practice of (synchronous) online learning (Endris & Molla, 2023). Therefore, this review proposed the following online learning framework - Figure 7 below for students at universities in emerging economies in a bid to improve their performance.

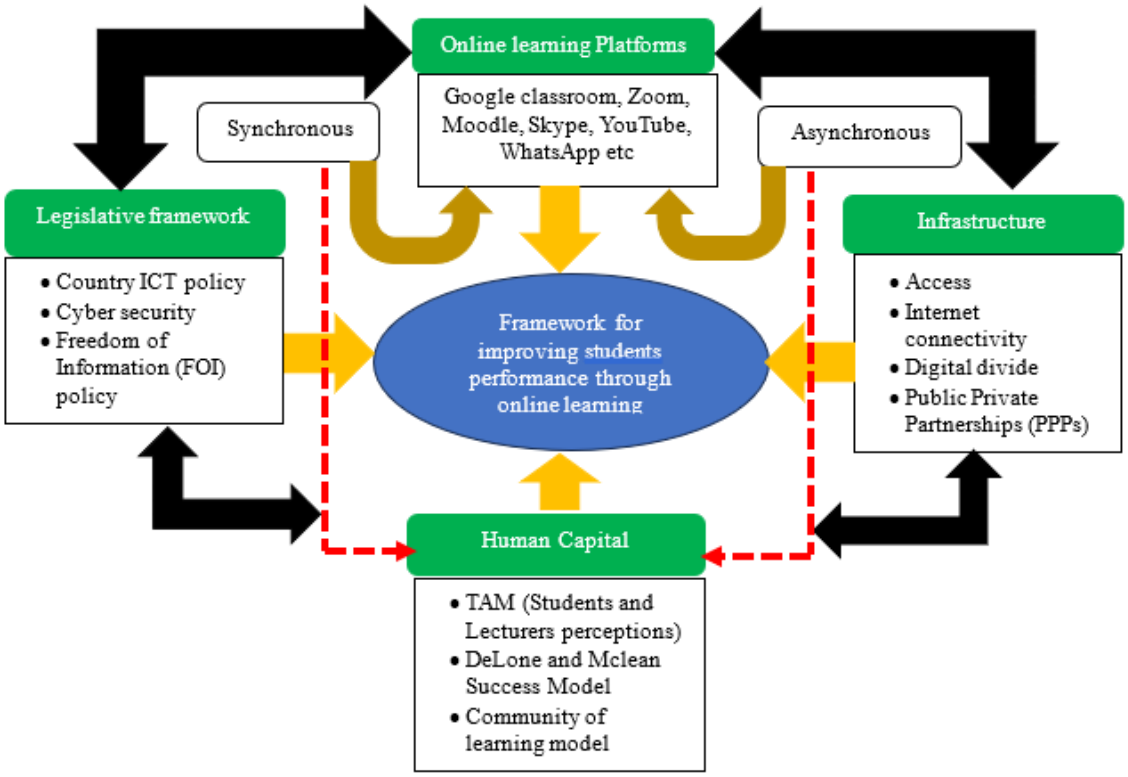

Figure 5. Framework for online learning

Platforms for Online Learning – Student performance

There are enormous numbers of online class tools available in the market. Some of the tools are free which are commonly used in emerging economies, and some of the tools are premium (Kulal & Nayak, 2020). From the literature review, the many popular online tools available is Google classroom is the most used and preferred tools for an online class. Zoom App is considered the second most popular and preferred tool for an online class. Even though Skype is the most popular online tool for communication, but here it is considered least using tools. Here the interesting fact is that many academicians are using social network tools (WhatsApp) for online classes. This review therefore recommends that universities in emerging economies free tools such as google classroom and Zoom so that both the institutions and the students can be able to such such platforms to improve their performance.

Synchronous and Asynchronous

Teachers and students join together in a common place in a real-time situation, which is known as synchronous learning. Moreover, Salmon (2013) says that synchronous learning is bounded with real-time interaction, which is collaborative. In addition, Teng et al. (2012) state that the synchronous learning is also facilitated on the

virtual platform where collaborative learning takes place. The instructors interact with students through teleconferencing, live streaming, video conferencing, live chatting and so on. Development of software in recent days with new features such as the chat-box window, polling questions, live feedback, survey and so on has been highly useful for the faculty members and the student community (Hrastinski, 2008b), Media supports synchronous e-learning and allows faculties and students to interact with each other, say Murphy et al. (2011); Park and Bonk (2007). The advantages of synchronous learning are that students can ask questions, seek answers, get immediate feedback and share opinions and ideas in the class as the session proceeding will be real time. The few disadvantages of synchronous learning are it is stressful due to the rigid schedule and may be continuous where students will be seated before the computers for long hours (Pappas, 2015; Perveen, 2016). The synchronous learning may be disrupted due to low network, unstable Internet connection and may not help the students learn continuously. The instructor sets the learning path for the learners to acquire knowledge at their own pace and time, which sometimes may not be up to the expectations of the students.

Henceforth, to get involved in synchronous learning, students and teachers must devote time and coordinate with each other. In addition, synchronous learning is sometimes not flexible (Teng et al., 2012; Perveen, 2016). Asynchronous learning style has been widely followed to avoid these issues and provide education in a flexible mode. The standard method used in asynchronous learning is through the prerecorded session, virtual library, social media platforms, online forums and so on (Malamed, 2011; Lin et al., 2012). The benefits of asynchronous learning are it offers a lot of flexibility for the learner to progress in their learning at their own pace and can access learning from any place and time. In support of this, Wind Kofoed (2020) says that asynchronous learning enables students to lean with flexibility in their own comfort zone. Moreover, students get an opportunity to learn with freedom and wisdom and do not have to completely depend on the instructor (Trach, 2018). Asynchronous learning is cost effective, where it does not require daily attention from the instructors (Lawless, 2020; Tucker, 2020). Since it is a self-guided module, students can work on the content themselves and avail their education at a minimal cost. Few demerits of asynchronous learning are students feel less connected to the instructors and create a sense of loneliness due to a lack of conversation with the instructors and peers. It would make students procrastinate their work due to a lack of supervision. Sometimes, students forget to complete their asynchronous activities assigned to them by the faculty members. In addition, faculty members have to send gentle reminders to the students and remind them to finish the work and submit the same for evaluation. The study findings show that synchronous learning is sometimes stressful, placing more responsibility on students mainly because of the increased screen time. At the same time, asynchronous learning allows the students to self-explore and research the topics assigned to them. Students also felt that asynchronous activities create a burden because of many written assignments to be submitted within a short period (Fernandez et al., 2022). This review therefore recommends that a blended approach should be used to

accommodate those students and lecturers who are not comfortable with synchronous learning or Asynchronous learning.

Legislative Framework and Infrastructure

In order to promote the uptake and usage of online learning by university students in emerging economies, sufficient government budgetary allocation should be made to universities to enable the acquisition of necessary equipment for online education. The students should be given more access to laptops, android phones, constant power supplies and internet access. The price of data from network providers should be subsidized to enable students to afford it. The lecturers should be adequately remunerated so as to motivate them to give their best towards the effectiveness of online education in universities for emerging economies (Ajibo & Ene, 2023).

This review also recommends that strengthening infrastructure facilities should include improvement in Internet connectivity (access), development of rural areas to bridge the digital divide, bringing changes in the attitude of students and teachers, etc. Colleges and other educational institutions are required to provide excellent training and support to both student and lecturers regarding the usage of online classes that helps in increasing their comfortability (Kulal & Nayak, 2020). This review therefore recommends that Public Private Partnerships (PPPs) should be promoted to put proper infrastructure that can promote online learning to improve students' performance. On their own universities in emerging economies can afford to provide the necessary infrastructure but their effort should be complemented by other players such as various telecommunication companies, government, and other internet services providers.

Human Capital

Human capital plays an important role in the development of a nation. It is the quality of the human beings of a country which helps in accelerating the pace of development. However, the fact is that human capital can be ensured through proper education only. Educated people are generally more productive workers because they can use the capital more effectively, can adopt new technologies, and learn from previous mistakes (Bordoloi, 2018). Therefore, this review recommends that the concept of human capital should be linked with the growth and development of a nation, and education should play an important role in producing the human capital for both the present and the future developments (Bordoloi, 2018). This can be achieved by students and lectures having a positive perception of online learning as indicated in the Technology Accepance Model (TAM), DeLenone and Mclean success model, and community learning model. It is students whose opinion matters most in the education system. Online classes may become a chunk of the future education system, but it cannot

be carried for the future unless students accept it (Kulal & Nayak, 2020). The findings of the study indicate that the students had favorable perceptions of online learning. Despite the students' positive perceptions, the results of the study showed that the practice of online learning in the universities was limited; especially the practice of synchronous online learning was low (Endris & Molla, 2023). This review therefore recommends that practice of online learning in universities should not be limited once the above proposed framework in Figure 7 above is implemented by various countries in emerging economies.

Practical implications

Higher education has undergone multiple transformations in a short period (2020, 2021 and beyond). Educational institutions underwent a rapid transition in remote teaching and learning in the initial stages. This study discusses how perceptions of overperformance and underperformance in terms of perceived preparedness and threat can be formed (Nam, 2019). As time progressed, educational institutions did course navigation where they relooked into their course plans, syllabus and brought a structural change to match the pandemic requirements. Meanwhile, educational institutions slowly equipped themselves with infrastructure facilities to bring academic integrity. At present, educational institutions are ready to face the new normality without disrupting services to society (Fernandez et al., 2022). The theoretical findings of this study therefore provide some insights to policy implications for online learning practitioners and policymakers on how it can improve university students' performance in emerging economies.

References

Ajibo, H. T., & Ene, J. C. (2023). Examining the prospect of online education as drivers of effective and uninterrupted university education in the post-COVID-19 era. *Journal of Applied Research in Higher Education*. https://doi.org/10.1108/JARHE-01-2023-0039

Alzahrani, H. A., Shati, A. A., Bawahab, M. A., Alamri, A. A., Hassan, B., Patel, A. A., Ahmad, M. T., El Maksoud, W. A., & Alsaleem, M. A. (2023). Students' perception of asynchronous versus synchronous distance learning during COVID-19 pandemic in a medical college, southwestern region of Saudi Arabia. *BMC Medical Education*, *23*(1). https://doi.org/10.1186/s12909-023-04034-5

Atmojo, A. E. P., & Nugroho, A. (2020). EFL Classes Must Go Online! Teaching Activities and Challenges during COVID-19 Pandemic in Indonesia. *Register Journal*, *13*(1), 49–76. https://doi.org/10.18326/rgt.v13i1.49-76

Bączek, M., Zagańczyk-Bączek, M., Szpringer, M., Jaroszyński, A., & Wożakowska-Kapłon, B. (2021). Students' perception of online learning during the COVID-19 pandemic: A survey study of Polish

medical students. *Medicine (United States)*, *100*(7), E24821. https://doi.org/10.1097/MD.0000000000024821

Bordoloi, R. (2018). Transforming and empowering higher education through Open and Distance Learning in India. *Asian Association of Open Universities Journal*, *13*(1), 24–36. https://doi.org/10.1108/AAOUJ-11-2017-0037

Chen, G., & Rahman, F. (2008). Analyzing privacy designs of mobile social networking applications. *Proceedings of the 5th International Conference on Embedded and Ubiquitous Computing, EUC 2008*, *2*, 83–88. https://doi.org/10.1109/EUC.2008.156

Clarke, T., & Hermens, A. (2001). *Corporate developments and strategic alliances in e-learning*. http://www.emerald-library.com/ft

Czerkawski, B. C., & Lyman, E. W. (2016). An Instructional Design Framework for Fostering Student Engagement in Online Learning Environments. *TechTrends*, *60*(6), 532–539. https://doi.org/10.1007/s11528-016-0110-z

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, *19*(4), 9–30. https://doi.org/10.1080/07421222.2003.11045748

El Mourabit, I., Andaloussi, S. J., Miyara, M., & Ouchetto, O. (2023). Identification of Online Learning Challenges During the COVID-19 Pandemic in Developing Countries: A Case Study of a Metropolis Faculty of Sciences. *International Journal of Emerging Technologies in Learning*, *18*(8), 238–258. https://doi.org/10.3991/ijet.v18i08.36747

Endris, A. A., & Molla, Y. S. (2023). University students' perceptions and practices of online learning in Ethiopia. *Higher Education, Skills and Work-Based Learning*, *13*(6), 1327-1338. https://doi.org/10.1108/HESWBL-03-2023-0075

Fernandez, C. J., Ramesh, R., & Manivannan, A. S. R. (2022). Synchronous learning and asynchronous learning during COVID-19 pandemic: a case study in India. *Asian Association of Open Universities Journal*, *17*(1), 1–14. https://doi.org/10.1108/AAOUJ-02-2021-0027

Fry, K. (2001). *E-learning markets and providers: some issues and prospects*. http://www.emerald-library.com/ft

Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, *2*(2-3), 87-105.

Halim, M. S. A. A., & Hashim, H. (2019). Integrating web 2.0 technology in ESL classroom: A review on the benefits and barriers. *Journal of Counseling and Educational Technology*, *2*(1), 19. https://doi.org/10.32698/0381

Harsasi, M., & Sutawijaya, A. (2018). Determinants of student satisfaction in online tutorial: A study of a distance education institution. *Turkish Online Journal of Distance Education*, *19*(1), 89-99.

Hettiarachchi, S., Damayanthi, B. W. R., Heenkenda, S., Dissanayake, D. M. S. L. B., Ranagalage, M., & Ananda, L. (2021). Student satisfaction with online learning during the COVID-19 pandemic: A study at state universities in Sri Lanka. *Sustainability (Switzerland)*, *13*(21). https://doi.org/10.3390/su132111749

Hilal, T. A., & Hilal, H. A. (2022). Social Networking Applications: A Comparative Analysis for a Collaborative Learning through Google Classroom and Zoom. *Procedia Computer Science*, *210*(C), 61–69. https://doi.org/10.1016/j.procs.2022.10.120

Johnson, J. B., Reddy, P., Chand, R., & Naiker, M. (2021). Attitudes and awareness of regional Pacific Island students towards e-learning. *International Journal of Educational Technology in Higher Education*, *18*(1). https://doi.org/10.1186/s41239-021-00248-z

Johnston, J., Killion, J. R. S., & Oomen, J. (2005). Student Satisfaction in the Virtual Classroom. *The Internet Journal of Allied Health Sciences and Practice, 3*(2). https://doi.org/10.46743/1540-580X/2005.1071

Khan, R., Bashir, A., Basu, B. L., & Uddin, M. E. (2020). Emergency online instruction at higher education in Bangladesh during COVID-19: Challenges and suggestions. *Journal of Asia TEFL*, *17*(4), 1497–1506. https://doi.org/10.18823/asiatefl.2020.17.4.26.1497

Kulal, A., & Nayak, A. (2020). A study on perception of teachers and students toward online classes in Dakshina Kannada and Udupi District. *Asian Association of Open Universities Journal*, *15*(3), 285–296. https://doi.org/10.1108/AAOUJ-07-2020-0047

Lai, J., & Widmar, N. O. (2021). Revisiting the Digital Divide in the COVID-19 Era. *Applied Economic Perspectives and Policy*, *43*(1), 458–464. https://doi.org/10.1002/aepp.13104

Lavy, S., & Naama-Ghanayim, E. (2020). Why care about caring? Linking teachers' caring and sense of meaning at work with students' self-esteem, well-being, and school engagement. *Teaching and Teacher Education*, *91*. https://doi.org/10.1016/j.tate.2020.103046

Li, D. (2022). Required Improvements from the Students' Perspective. *The Electronic Journal of E-Learning*, *20*(1), 1–18. www.ejel.org

Mannan, S. E., Parvej, Md. I., Tabassum, M., & Ahmed, F. (2020). Undergraduate and Postgraduate Education During Lockdown Due to COVID-19 Pandemic in Bangladesh. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal*, *3*(4), 2177–2184. https://doi.org/10.33258/birle.v3i4.1492

Masrom, M. (2007.). *The Technology Acceptance Model and the E-learning*. https://www.researchgate.net/publication/228851659

Mohamed Abd El-Hamed Diab, G., & Fouad Elgahsh, N. (2020). E-learning During COVID-19 Pandemic: Obstacles Faced Nursing Students and Its Effect on Their Attitudes While Applying It. *American Journal of Nursing Science*, *9*(4), 300. https://doi.org/10.11648/j.ajns.20200904.33

Muirhead, B., & Juwah, C. (2005). Insights for teachers and students. *International Journal of Instructional Technology and Distance Learning*, *23*, 1-145.

Nam, T. (2019). Understanding the gap between perceived threats to and preparedness for cybersecurity. *Technology in Society*, *58*. https://doi.org/10.1016/j.techsoc.2019.03.005

Nusrat, M. (2021). Educational Response Toward Covid-19 Pandemic: Perception, Problems and Prospects; A Bangladeshi Context. *European Journal of Education and Pedagogy*, *2*(5), 25–32. https://doi.org/10.24018/ejedu.2021.2.5.163

Orkibi, H., & Tuaf, H. (2017). School engagement mediates well-being differences in students attending specialized versus regular classes. *Journal of Educational Research*, *110*(6), 675–682. https://doi.org/10.1080/00220671.2016.1175408

Oyedotun, T. D. (2020). Sudden change of pedagogy in education driven by COVID-19: Perspectives and evaluation from a developing country. *Research in Globalization*, *2*. https://doi.org/10.1016/j.resglo.2020.100029

Patricia Aguilera-Hermida, A. (2020). College students' use and acceptance of emergency online learning due to COVID-19. *International Journal of Educational Research Open*, *1*. https://doi.org/10.1016/j.ijedro.2020.100011

Pazilah, F. N. P., Hashim, H., & Yunus, M. Md. (2019). Using Technology in ESL Classroom: Highlights and Challenges. *Creative Education*, *10*(12), 3205–3212. https://doi.org/10.4236/ce.2019.1012244

Rafique, R. (2023). Using Digital Tools to Enhance Student Engagement in Online Learning: An Action Research Study. In *Local Research and Global Perspectives in English Language Teaching: Teaching in Changing Times* (pp. 229–248). Springer Nature. https://doi.org/10.1007/978-981-19-6458-9_15

Salman, D., & Soliman, C. (2023). Insights from online education in the Egyptian higher education. *International Journal of Educational Management*, *37*(1), 135–146. https://doi.org/10.1108/IJEM-05-2022-0173

Sangster, A., Stoner, G., & Flood, B. (2020). Insights into accounting education in a COVID-19 world. *Accounting Education*, *29*(5), 431–562. https://doi.org/10.1080/09639284.2020.1808487

Shahzad, A., Hassan, R., Aremu, A. Y., Hussain, A., & Lodhi, R. N. (2021). Effects of COVID-19 in E-learning on higher education institution students: the group comparison between male and female. *Quality and Quantity*, *55*(3), 805–826. https://doi.org/10.1007/s11135-020-01028-z

Shrestha, S., Haque, S., Dawadi, S., & Giri, R. A. (2022). Preparations for and practices of online education during the Covid-19 pandemic: A study of Bangladesh and Nepal. *Education and Information Technologies*, *27*(1), 243–265. https://doi.org/10.1007/s10639-021-10659-0

Singh, V., & Thurman, A. (2019). How Many Ways Can We Define Online Learning? A Systematic Literature Review of Definitions of Online Learning (1988-2018). *American Journal of Distance Education*, *33*(4), 289–306. https://doi.org/10.1080/08923647.2019.1663082

Sutton, H., Gatrell, J., & President, V. (2020). *Keep your mission student-centered, even in the face of crisis Contributing Editor*. https://doi.org/10.1002/dap

Tan, L. S., Kubota, K., Tan, J., Kiew, P. L., & Okano, T. (2022). Learning first principles theories under digital divide: Effects of virtual cooperative approach on the motivation of learning. *Education for Chemical Engineers*, *40*, 29–36. https://doi.org/10.1016/j.ece.2022.04.003

Teng, D. C. E., Chen, N. S., Kinshuk, & Leo, T. (2012). Exploring students' learning experience in an international online research seminar in the Synchronous Cyber Classroom. *Computers and Education*, *58*(3), 918–930. https://doi.org/10.1016/j.compedu.2011.10.018

Topala, I., & Tomozii, S. (2014). Learning Satisfaction: Validity and Reliability Testing for Students' Learning Satisfaction Questionnaire (SLSQ). *Procedia - Social and Behavioral Sciences*, *128*, 380–386. https://doi.org/10.1016/j.sbspro.2014.03.175

van Dijk, J. A. G. M. (2006). Digital divide research, achievements and shortcomings. *Poetics*, *34*(4–5), 221–235. https://doi.org/10.1016/j.poetic.2006.05.004

Zarei, S., & Mohammadi, S. (2022). Challenges of higher education related to e-learning in developing countries during COVID-19 spread: a review of the perspectives of students, instructors, policymakers, and ICT experts. *Environmental Science and Pollution Research*, *29*(57), 85562–85568. https://doi.org/10.1007/s11356-021-14647-2

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