Higher Education Challenges in the Era of COVID-19 from the Perspective of Educators and Students (Ghana, Georgia and Pakistan Cases): A Literature Review

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Abstract

For the last three years, the entire world has faced a colossal phenomenon due to the COVID-19 pandemic. All sectors and areas of life have been affected, which has forced rapid and radical changes towards adaptation in its wake. The unexpected pandemic's mark and impact on education is more severe and longer lasting than imagined. It has evidently disrupted education provision at an unprecedented scale. This paper is a literature review that focuses on the experience of different countries and education systems during the COVID-19 pandemic. Based on the analysis of the existing literature and research on this issue, from the perspective of educators and students, including the experience of different countries around the world, the pandemic has had a great impact on higher education. This has resulted to digital transformation, which implies overcoming many challenges. The review uses particular examples of higher education in the era of COVID-

19 in Georgia, Ghana, and Pakistan. The measures taken to continue education in spite of the pandemic are also highlighted. Although this phenomenon proved to be challenging, it has initiated enormous opportunities for creativity within progress. This paper further discussed barriers that students and academics faced during online teaching-learning, the pros and cons of online teaching-learning, the quality of teaching-learning, and the state of preparedness for future education.

Introduction

The pandemic has been a major challenge for almost every sector of the world, including the education system. The gradual educational transformation from traditional face-to-face to the digital or hybrid educational system has received considerable attention from Governments all over the world. Most countries have made attempts to introduce technologies as part of the efforts to transform their educational systems from the elementary to the tertiary level (García-Morales et al., 2021). Thus, a growing number of colleges and universities have been implementing a transition from traditional face-to-face teaching methods to online teaching or a combination of online and traditional teaching technically known as the blended learning approach (Rajab et al., 2020). This form of transition and management of technological systems to support teaching and learning had been a common practice among some schools in developed countries and few schools in developing countries until the worldwide pandemic struck and sharply caused a swift deployment of the use of the online system at the expense of the traditional/conventional system (Bashir et al., 2021; García-Morales et al., 2021; Mahyoob, 2020; Johnson et al., 2020; Henaku, 2020; Chidambaram, 2020; Duong, 2021; Cheng et al., 2021; Jin et al., 2021; Banji et al., 2021; Amir et al., 2020; Puspitawati, 2020; Almendingen et al., 2021; Aliyyah et al., 2020; Means & Neisler, 2020).

The emergence of COVID-19 in Wuhan, China, compelled the World Health Organization (WHO) to declare it a pandemic after studying its mode of spreading and suggested rigorous prevention measures, including social distancing (WHO, 2020; Aboagye et al., 2021; Adedoyin & Soykan, 2020). Complementarily, governments across the globe followed the directives and issued executive fiat. As a result, all businesses, sports activities, and schools were closed. Subsequently, institutions were forced to migrate to online platforms as part of the measures to mitigate the adverse impact of the pandemic on education (Barrot et al., 2021). Following the immediate closure of all activities which involve human contacts, schools with adequate digital

muscles substituted the in-person instruction for remote learning without effective preparations. However, despite certain limitations in China, the government initiated a "Suspending Classes Without Stopping Learning" policy to ensure that learning was not compromised at any time during the COVID-19 pandemic lockdown (Zhang et al., 2020). For example, Georgia, Pakistan, and Ghana also closed all schools. Although universities, polytechnics, and colleges were allowed to continue with online learning, high and basic schools remained closed until further notice. Students also participated in the government's radio and television learning programmes to support those at home until early 2021 when all schools were directed to reopen and adhere to all protocols. Similarly, teaching tools, such as Skype Call, Vipers, ThingLink, Zoom, Google meet, and other video conferencing apps were introduced to both teachers and students in other jurisdictions (Hamzah & Ahmad Shaberi, 2021; Sobaih et al., 2021).

However, moving from an offline to an online mode of learning poses a number of challenges for students and educators in both developed and developing countries (Liguori & Winkler, 2020). For instance, the key hurdles of online education in developing nations include insufficient ICT skills, poor network administration or IT skills, and insufficient content development capabilities (Aung & Khaing, 2015; Hadullo et al., 2018; Noor et al., 2020). In Kenya, a study found that three major barriers to online education adoption include insufficient IT infrastructure, weak ICT skills, and a lack of financial resources (Ngwacho, 2020; Almaiah et al., 2020). Another study by Kanwal and Rehman (2017) revealed that the main impediments to successful online education adoption in Pakistan include the absence of an existing IT infrastructure, Internet availability, and computer literacy (Kanwal & Rehman 2017). According to Kenan et al. (2013), cultural, political, and economic obstacles were the key reasons for Libyan online education's failure. Kisanga and Ireson (2015) highlighted poor interface design, insufficient technical assistance, and a lack of IT skills as major hurdles to the successful implementation of existing e-learning projects in Tanzania.

The migration and emphasis on online teaching and learning has burdened all the stakeholders of the education sector across the three countries. Therefore, efforts need to be put in place to sustain the gains made during the pandemic as transition is made into the post-COVID-19 era. Specifically, many instructors and students are struggling to adopt online teaching and learning mode (Hodges et al., 2020). The sudden shift towards remote or online teaching and learning at such short notice globally was a novel phenomenon (Brom et al., 2020). These types of emergencies are not planned and require the competency of using technology to teach remotely (Joshi et al., 2018; Rush et al., 2016). The transition to online teaching has also created problems in the process of fully implementing student support activities. This

is because the university is obliged to create a student-friendly environment, to offer relevant services, to inform them, and support students with low social status or disabilities. Also, it was a great challenge for Georgian universities to provide socially disadvantaged students with the resources needed for distance learning, especially for state universities (Bakradze, 2020, p.3-4).

It is noteworthy that online teaching has had an impact on curricula that require both practical and laboratory teaching. Students found it difficult to achieve learning outcomes in technical subjects. As a result, the students at technical faculties were more affected than those in the humanities. Nonetheless, it was a challenge for everyone, both students and academic staff, to suddenly study and teach in an unusual format.

As it is known, the online teaching process requires the proper equipment, access to Internet, relevant skills and experience, which were lacking before the pandemic and remains a significant challenge today. All of the above, along with other factors (job closures, lack of income or downsizing) initially caused tension and uncertainty. The urgency of the process is also due to the regulations imposed by the state to increase access to education, in particular, higher education, which in turn has become an important dilemma for universities.

Thus, the purpose of this study is to conduct a comprehensive review about the challenges of instructors and students in regards to post-COVID-19 online teaching and learning in Ghana, Georgia, and Pakistan.

Desk review was used as a research method of the study. Based on the analysis of the existing literature and research on this issue, which includes the experience of countries around the world, as well as Georgia, Ghana and Pakistan, it can be concluded that the pandemic has really had a great impact on higher education. This has resulted to digital transformation, which implies overcoming many challenges. Although this phenomenon has proven to be challenging, it has initiated enormous opportunities for creativity within progress. All of this will be discussed in this article based on the questions and issues below:

- What barriers do students and academics face during online teaching-learning (e.g., emotional, technical, financial, material ...);
- What are the pros and cons of online teaching- learning?
- Are they satisfied with the policy pursued by the state in this direction?
- What other steps can be taken to ensure access to quality education?

Literature Review

Digital transformation is not a novel phenomenon, and it has been accompanying higher education institutions for some years now (Kopp et al., 2019; Leszczyński et al., 2018).

Digital transformation in the context of higher education institutions can be regarded as the summation of all digital processes required to accomplish transformation process that gives higher education institutions the opportunities to positively apply digital technologies optimally for teaching and learning (Kopp et al., 2019).

It has been argued that the contemporary transformation will be seen as revolutionary modifications in the specifications of higher education as a process and as an institution in the next 50 years. This is because the transformation has moved face-to-face instructional programs using objectivist, teacher-centered teaching methods, for thousands of home-grown, provincial and domestic universities to online and hybrid programs. This is possible by applying digital technologies in enhancing constructivist, learner-centered, and cooperative pedagogy for some hundred "mega-universities" that function worldwide (Hiltz & Turoff, 2005; Adedoyin & Soykan, 2020). Institutions' fast-paced move into the blended or hybrid models and the widespread adoption of digital technologies for course redesigns and pedagogical transformations have engendered significant challenges for both students and academic communities. When the pandemic started, this relatively new terminology had to be defined, explained, and assimilated at light speed.

OECD Definition

Online learning (e-learning) involves the use of digital materials in the learning process. This does not necessarily have to be done remotely and can be conducted at classrooms in accordance with traditional teaching methods known as mixed learning (Bakradze, New Educational Reality, Terms, Challenges, Recommendations, 2020). Distance learning refers to learning that takes place away from the classroom or workplace. Traditionally, it includes courses without direct contact, when a student connects to an educational institution by mail. Today, it mainly includes online education, where the teacher conducts lessons and gives assignments using digital technologies. In short, the term "online learning" is mainly used to refer to learning through digital resources that is carried out remotely (OECD 2005, p.11).

UNESCO Definitions

Distance learning is a general term in education that implies the distance between a student and a teacher in time and space. It includes online education (80% of information is transmitted over the Internet) and mixed learning (30-79% of content is delivered through the Internet), as well as the form of education that uses printed material. During online learning, most or all of the content ($\geq$ 80%) is delivered online only. Online education is not

synonymous with distance learning. However, in many developed countries that have widespread access to the Internet, it is the most widespread form of distance education (Carlsen et al., 2016, p.105).

The European Association for Quality Assurance in Higher Education (ENQA)

The document prepared by the ENQA e-learning Working Group on "considerations for quality assurance of e-learning provision Report from the ENQA Working Group VIII on quality assurance and e-learning" clarifies the definition of terms related to non-traditional teaching methods, in particular e-learning. However, the document states that "e-learning terms and definitions may vary by different countries. Nevertheless, it is necessary to define terms in order to share a common understanding." (Huertas et al., 2018, p.4).

The pandemic became the engine of digital transformation in Georgia. The Georgian education system, including educators, students, IT specialists, representatives of the quality of education service, and various departments of the administration were faced with the novelty. Naturally, the situation caused by the COVID-19 pandemic was found to be unusual and stressful initially due to the challenges mentioned earlier.

In Ireland, a study by the QQI (2020) on the effects of COVID-19 found that higher education institutions had some experience in distance learning. Nevertheless, about 60% of the academic staff had little or no distance learning experience, and only 13% reported sufficient experience. There were also significant changes in the level of support by staff and students, which was based on their individual context. Some staff and students had online learning experience, while some had little or no experience (QQI, 2020).

The COVID-19 pandemic has caused numerous changes in the lives of students. According to the Irish research document, 38% of students at one of the higher education institutions mentioned that they lost their jobs and became unemployed. Thus, students are concerned about the current situation and express worry about their future carrier.

Conventional and E-learning Approaches of Teaching and Learning

Globally, the fast growth of technology has had an impact on all aspects of human existence, most notably agriculture, medical, education, communication, record keeping and administration, and so on. Countries throughout the globe made excellent investments and formulated and implemented policies to assist them use technology for economic growth and development so as to embrace this global phenomenon and increase the capability of their human capital.

Most schools around the world deployed the use of online learning to supplement the traditional learning approach called blended learning. This effort persisted until the COVID-19 pandemic outbreak forced many institutions to embrace an online learning approach to contain the spread of the virus. The emergency response from educational institutions during crises (e.g., pandemics or conflict) to shift teaching and assessments online is known as Emergency Remote Education (ERE) (Shin & Hickey, 2020). Due to the nature of the spread of the virus, most schools that could not transform to the digital space were closed for almost a year.

In every educational system, the pedagogical strategies of teaching and learning differ significantly. While some found it prudent to use conventional means (traditional face-to-face), others deployed the use of the Internet or Hybrid form for teaching and learning. According to Oscar (2020), online learning has several advantages over traditional learning, but it appears that traditional face-to-face learning received Global use all over the world.

Traditional Face-to-face is an approach for teaching and learning which strives on delivering instructional content to learners through physical contact. This is characterized by an instructor-led approach and instructor-based activities, where students are taught in a manner that is conducive to sitting and listening (Tularam, 2018). This instructional model has been used for its relevance and popularity, and many instructors prefer to adopt it for teaching and learning (Flanigan et al., 2021). Online teaching and learning, on the other hand, involve the use of the Internet and technological tools to deliver instructional materials and content for teaching and learning (Adedoyin & Soykan, 2020). There are two forms of online instruction: synchronous and asynchronous. Synchronous online courses strive to replicate the communication paradigm of a traditional classroom by allowing instructors and students to be online at the same time through a virtual platform such as google meet and Zoom (Abu Talib et al., 2021; Hsiao, 2010). Asynchronous online classes are differentiated by more versatility and self-paced learning possibilities since they do not demand real-time contact or meeting at a defined time (Abu Talib et al., 2021; Hsiao, 2010).

During the COVID-19 pandemic, most instructors with limited experience in online education design readily converted their traditional classrooms to synchronous online courses by simply uploading the teaching materials over an online learning management system (Gillis & Krull, 2020).

These measures have extensively influenced the understanding of the impacts of emergency use and integration of online and other types of digitalized learning and teaching on the role of institutional deployment of the approach. Most schools, however, deployed the use of an online learning approach without adequate preparations (Maphosa, 2021; Coman et al., 2020; Hondonga et al., 2021; Addae et al., 2021; Aduhene & Osei-Assibey,

2021). The use of online learning helped many institutions to plan digital content with haste and provided the opportunity to engage students remotely. Complementarily, literature has it that the use of online learning could improve the consistency and quality of instructions, both for formal and non-formal education, and increase opportunities for more student-centered pedagogical approaches. This will promote education by addressing inequalities in gender, language, disability, among others (Leu & Price-Rom, 2006). Furthermore, the use of online platform for teaching and learning has widened the traditional sources of information and knowledge by fostering collaboration, creativity, and higher-order thinking skills. Also, it has provided flexibility of delivery of lessons as well as reaching a wider range of student population outside the traditional education system. Given the benefits that online education offers for teachers, students, and institutions, it is not surprising that it has attracted so much attention (Kebritchi et al., 2020; Konetes, 2011).

Increases in the number of online programs and course offerings are altering the role of instructors and the nature of teaching, with an increasing number of professors and support personnel needed for online instruction (Bennett & Lockyer, 2004). Teachers, who are at the forefront of this growing need and pressure to teach online, are being forced to reconsider their basic beliefs about teaching and learning, as well as the responsibilities they play as educators (Wiesenberg & Stacey, 2008). This increased interest in online education necessitates a rethinking of higher education institutions' cultural, intellectual, organizational, and pedagogical frameworks in order to adapt to a new culture of teaching and learning (Howell, Saba, Lindsay, & Williams, 2004). While conventional teaching responsibilities may be transposed to the online environment, the affordances and restrictions of the new learning environment necessitate instructors adapting to new roles in order to provide successful and meaningful learning experiences. As a result of the Internet's accessibility and the flexibility of online courses, online education has become an essential component of higher education (Luyt, 2013).

In the literature, several studies have addressed the challenges associated with the introduction of e-learning (Pokhrel & Chhetri, 2021; Rajab et al., 2020). Evidence suggests that the implementation of electronic learning initiatives failed because institutions and their constituents were unprepared for the experience (Aboagye et al., 2021). Furthermore, individuals are connected to present pedagogies and practices, which made it difficult for them to adapt to new ones and update old ones (Kundu & Bej, 2021). According to Kundu and Bej (2021), student opinion of online learning has been poor owing to previous experiences, which resulted to high dropouts and low learner motivation (Aboagye et al., 2021). Other factors highlighted include poor student satisfaction with the online learning experience (Aboagye

et al., 2021). Nonetheless, data indicates that students and instructors are as satisfied with online learning as they are with conventional learning (Ali & Ahmad, 2011).

This pandemic is the first of its kind in recent times, disrupting higher education institutions, and both teachers and students have found the experience to be challenging. Therefore, it is critical to study and understand students' experiences during this time to better prepare for future interruptions to higher education institutions and to understand how COVID-19 has shaped our students, especially since studies have shown that COVID-19 has had a significant impact on psychological wellbeing in the general population (White & Van Der Boor, 2020).

According to research, there was no substantial difference in the objective assessments and effectiveness of conventional and synchronous online learning (He et al., 2021), and students preferred the flexibility of asynchronous forum. Nevertheless, they also enjoyed the capacity to interact in real-time online interaction with the lesson (Gillis & Krull, 2020; Hsiao, 2010).

Teachers and instructors were faced with several problems throughout the transition. However, the initial step, for some of them, was to design online courses using instructional design concepts and then teach them online (Chen & Liu, 2021; Cote et al., 2020; Gillis & Krull, 2020).

Conceptualizing Online Teaching and Learning Challenges Global Context

According to the UN (2020) report, the COVID-19 outbreak has inflicted the very worst disruptions in education systems in history, impacting over a billion students across almost all nations and continents. Schools and other learning space closures have affected 94 percent of the world's student population, including 99% in lower-middle-income nations. COVID-19 has left no part unaffected in any nation on the earth, and its consequences will be felt for years to come (Mohamedbhai, 2020). However, while massive effects were being utilized to change and develop higher education throughout the globe, there is a risk that COVID-19 will harm the sector with serious consequences (Aborode et al., 2020).

Comparing the developed world to the developing countries is a bit problematic. Furthermore, it was discovered that low-income countries are faced with challenges such as inadequate knowledge. Poor Internet connectivity in the use of technological tools and deficiencies in content development (Aung & Khaing, 2015) is also still a phenomenon for many teachers, especially at the tertiary level in third world nations.

The Chinese government for instance has taken stringent steps to halt the spread of the COVID-19 epidemic (Zhu & Liu, 2020). The majority of

face-to-face activities, including teaching, have been prohibited. The start of the spring semester at Chinese universities and colleges has been postponed. Students were not also permitted to return to campus without prior authorization.

The United States of America has millions of international students communing from their respective countries to the numerous colleges and universities in the states in America to pursue their education. Hess (2020) conceded that all these students have been direly impacted by the COVID-19 pandemic. In the review of Leping et al. (2021), over a thousand colleges and universities in the states were closed and about 14 million students were left stranded. During the periods of the schools' closure, many researchers reported the tremendous efforts made by universities and colleges to transit from traditional (face-to-face) to online education (Greenhow & Lewin, 2021; Carrillo & Flores, 2020; Crompton et al., 2021). They further mentioned the challenges as well as the opportunities that instructors and students were confronted with during and after the COVID-19 pandemic (Moore et al., 2021; Kaisara & Bwalya, 2021).

The proper functioning of distance learning, along with other conditions, is based on two main factors: The first is technical capabilities, which include electronic devices (computer, tablet, smartphone, phone, etc.) and Internet access, as well as digitalized learning management systems (LMS), which facilitate the continuity of the online learning process. Provision of Internet access in Georgia started years ago and presently covers most of the regions of the country. In the 21st century, when it comes to access to education and the right to do so, even the smallest population, especially students, should have access to the Internet. A relatively minor but slightly larger scale problem is the quality of the Internet connection and its stability. This issue is mostly related to the students living in rural areas, who are provided with consistently low-quality connectivity.

At the universities, curricula have been modified, teaching methods and assessment systems were revised, relevant guides and video instructions for students and lecturers were developed as well. Also, online lecture/seminar recordings were uploaded to the relevant platform and made available specifically to the students registered to that subject. An online hotline has been set up at the university to solve technical problems. Universities and the state have pursued preferential tuition policy for students due to the pandemic (Bendeliani, Interpressnews, 11 August 2020).

The Georgian Context
The Main Challenges in Georgia During the Pandemic

- Access to Internet and owning a computer was a challenge in Georgia even before the pandemic. For example, 20% of the Georgian population does not have access to the Internet and about 64% have access to a computer. It can be said that 80% of those who have access to the Internet before the pandemic used it for communication on social networks and rarely for educational purposes (Tvalabeishvili, "The Right to Education during Pandemic," New Education, 2020).
- Learning infrastructure, in many cases, is not adapted to modern technologies. The qualification and knowledge of professionals in this area also remains a challenge. Professors and teachers suddenly found themselves faced with a new reality when the curriculum and the lessons plans had to be completely redesigned for online teaching. However, they did not have the basic skills of using a computer nor the Internet. (Tvalabeishvili, "The Right to Education during Pandemic," New Education, 2020). This situation obviously affected the quality of teaching as well as the number of pupils and students to be taught efficiently.
- The process was spontaneous and the best practice was elaborated during the process. This way of teaching presented problems for a number of groups because certain directions were being tested on the go. For example, it can be said that students with disabilities remained outside the educational space, despite their formal involvement in the teaching-lecture process (Tvalabeishvili, "The Right to Education during Pandemic," New Education, 2020). Accessibility depended on the individual responsibility and goodwill of each professor or teacher.
- During the pandemic, it became necessary to introduce new forms of teaching, especially using modern technologies. It required appropriate readiness, knowledge, and skills from both the academic staff and the students, which is not so easily mastered, especially by the older academic staff. Both parties should be actively involved in the use of modern teaching-learning methods and assessments, forms, proper use of resources, the use of digital technologies, and other such endeavors. It is important to have the appropriate knowledge and motivation to learn and develop in this direction so as to ensure the efficiency and quality of the process. Current educational programs are accredited with traditional, face-to-face quality assurance standards that do not provide for online learning. Online learning has reduced the quality of teaching courses/modules, shifted the time to study practical subjects, and has made it difficult to achieve some learning outcomes in executive programs, medical programs, and other

programs with laboratory or practical training. Nonetheless, there were few e-manuals, digital libraries, auxiliary e-materials or virtual laboratories (Bakradze, New Educational Reality, Terms, Challenges, Recommendations, 2020).

- As for internationalization and mobility, students and academic staff can no longer physically afford it. However, it can be done online so that they no longer have to leave the country in order to get education abroad.

As already mentioned, the online teaching-learning process is specific and different from traditional teaching. In order to conduct it, the academic staff must not only have the knowledge and skills to use modern technology, but also be able to adapt teaching-learning and assessment strategies to online teaching. Furthermore, they should be motivated to explore and develop all of the above. Accordingly, the academic staff needs development and constant support. The transition to online learning has shown that the academic staff was not ready to use modern technologies and as mentioned above, the problems did not arise only in Georgian reality.

Both academic staff and students need technical support from relevant services. These functions were performed by an online hotline at some universities. However, solving problems such as limited Internet connection, lack of equipment, etc., was difficult to solve without the involvement of the state. Most students use a mobile phone because it is more comfortable to use but it requires vigilance. Hence, another requirement is cyber hygiene and security (Bakradze, new Educational Reality, Terms, Challenges, Recommendations, 2020).

Steps Taken in the Direction of Higher Education During the Pandemic and Legislative Changes in Georgia
There have always been difficulties in terms of equal access to quality education in Georgia, but since everything has stopped, the problem of access has been faced by almost everyone during the first stage. Kindergartens, private and public schools, vocational and higher education institutions, groups, and foreign language training centers were closed. All institutions where formal or non-formal education was available were closed. (Abkhazava, COVID-19 - The Catalyst Effect on Education (Part 1), Radio Liberty, 2020).

Challenges and Opportunities Created by the Pandemic
An important positive aspect of the pandemic reveals that Georgia began to introduce innovative approaches in the educational space. In order for students not to be delayed, distance learning is the most pragmatic solution

for almost every country. As for the situation in Georgia, in the summer of 2020, the Law of Georgia on Higher Education ("Law of Georgia on Higher Education", 2005) was amended to include the term "e- learning".

E-learning

This involves the study process or a part thereof that does not require the presence of a student and the personnel of a higher education institution simultaneously at a certain location based on modern information and communication technologies. Also, it is organised by a higher education institution for persons in the territory of Georgia to acquire a qualification on the basis of higher education programmes accredited in Georgia. Appropriate approaches and methods for planning the curriculum as well as organising and administering the study process are required to provide e-learning (Article 477 Law of Georgia on Higher Education, 2005).

During distance learning, information is transmitted electronically using various means of digital communication. There are different forms of e-learning: Asynchronous, synchronous or hybrid.

Synchronous learning is an integral part of the traditional learning process. In this case, the teaching takes place in the classrooms and the learning process is planned in advance. Accordingly, the communication between the students and the lecturer takes place at the same time. With the development of technology, teaching methods were evolving and improving. Various webinars, online trainings, and the Internet in general have made it quite comfortable and accessible to transfer synchronous learning to online mode (Ghvinefadze & Tielidze, "Principles of programming and management of e-learning platform on the example of ILIAS system", 2016). As for asynchronous learning, it is mainly student-centered teaching. The learning process is not spelled out in time and communication between students and lecturer takes place through various online platforms. Since teaching does not take place in classrooms, students have the free choice to engage in the learning process from anywhere at any time. Asynchronous learning helps a person in both education and personal development by using methods such as Blogs, social networks, webinars, and various electronic media (QQI 2020, p.76). Hybrid learning involves both a synchronous and an asynchronous method. Interestingly, this method is the most common in the world today (QQI 2020, p.76).

The National Center for Educational Quality Enhancement has taken the initiative to support higher education with an auxiliary textbook aimed at ensuring online and hybrid learning and its quality, which in turn will help the Georgian higher education sector to easily overcome the shortcomings caused by the COVID-19 pandemic (Crozier & Greer, "Criteria and Guidelines for the Evaluation of Online and / or Mixed Learning and Teaching", 2020). Such

an approach will accelerate Georgia's integration into the international educational market. With the help of modern digital technologies, students will be competitive. This will help them in their personal development, as well as the country for economic and social development. Online education used to be only a free choice and a future plan for Georgia, but the current reality has forced the country to quickly implement online and hybrid education with the help of digital technologies. In the beginning, there were various problems including technical deficiencies, lack of digital skills, unqualified staff, and so on. However, through joint efforts, the education system faced the challenge well. Most importantly, the learning process did not stop at higher education institutions. Also, the hybrid teaching method was the most tailored and comfortable method for students with a profession since attendance was mandatory due to the specifics of the subjects. Higher education is one of the main preconditions for the economic development of the country. Therefore, the state should make every effort to spend more resources on education in order to further improve the teaching process and make it as adaptable as possible to the student so as to have a positive outcome in return.

In the 21st century, innovative methods are essential in the digital world for general, vocational, and higher education levels (Tvalabeishvili, "The Right to Education during Pandemic," New Education, 2020).

The pandemic, along with all the other challenges, presented new opportunities for universities. For example, the mobility online can be done without leaving Georgia, lecturers can be invited online, and so on. (Tsiramua, Higher Education Challenges and Potential, GEORGIA FORBES WOMAN, 2021).

Some of the positive results of the pandemic include the following:
1. The desire expressed throughout the higher education sector to be quickly involved in a whole new situation that required the rapid development of staff skills in order to maintain the delivery of education to students;
2. The crisis has revealed more potential for international education, which is available to a larger number of potential students;
3. Students acknowledged the support and effort from academic staff, including those who did not have online teaching experience;
4. The staff realized the support and assistance they received from the Ministry of Education and the National Center for Education Quality Enhancement.
5. In some cases, emergency response proved useful and resulted in, for example, better attendance and student engagement and better term papers (Crozier & Greer, "Criteria and Guidelines for the Evaluation of Online and / or Mixed Learning and Teaching", 2020).

The main advantage that studies have shown is optimization of financial resources and time. These are the two most important resources that can help a person take the next steps successfully. Nevertheless, it has been noted that a certain proportion of students are in favor of traditional teaching because they believe that hybrid and/or online teaching reduces social interaction, which is quite an important component in terms of personal development.

Some of the negative aspects include the low motivation of the academic staff, especially the elderly staff, to deepen their knowledge in the field of digital skills, to use technologies, to use equipment, to use modern educational technologies during lecture-seminars or to study from scratch. Also, low motivation of students and lack of mobilization during the online learning process, emotional barrier which limits interaction (this occurs when the video- camera is not turned on), health problems (vision, scoliosis ...), lack of equipment, Internet access, and so on.

The benefits for each student in particular are as follows:

- Efficiency - Distance learning allows the student to make and manage their own schedule, they can decide when and where to study and how much time to devote to learning (FOX, "What are the Advantages and Disadvantages That Distance Education Can Offer You?", 2020)
- Study from anywhere - Students can study without leaving home or office. They just need to have access to the Internet. Such learning is especially accessible to people with disabilities, prisoners, and people living far from educational institutions (Tvalabeishvili, "The Right to Education during Pandemic," New Education, 2020)
- High Academic Outcomes - According to American science studies, the results of distance learning are not inferior to the results of traditional teaching. During distance learning, students work much harder on themselves in order to deepen their knowledge, with the help of modern technologies. This, in turn, has positive impact on their academic results (Tvalabeishvili, "The Right to Education during Pandemic," New Education, 2020)
- Saving the expenses – This is one of the major benefits of distance learning. In this case, the daily expenses that are familiar to all students are reduced (such as transportation costs, food costs, rent costs, etc.). (Tvalabeishvili, "The Right to Education during Pandemic," New Education, 2020)
- Individual approach - In distance learning, a very important component is the student-centered environment, which considers individual needs. In addition to being able to choose and allocate time for education, they can also have contact with lecturers and get answers to existing

questions within a small amount of time (Tvalabeishvili, "The Right to Education during Pandemic," New Education, 2020)

However, the disadvantages and challenges that accompany distance learning are as follows:

- Lack of communication - This implies lack of direct communication between students and the lecturer, as well as among students due to the virtual environment. Therefore, distance learning is less likely to facilitate development of such skills as team work, direct communication, and so on.
- Lack of practice - It is quite difficult to electronically learn courses that require practical assignments.
- Problem of user identification - Another difficulty with exams is determining if the student wrote the exam honestly or not. In this case, video surveillance is the only applicable solution. However, students still have to be on site to take the exams and prove that they are not cheating, especially if they want high academic results (Tvalabeishvili, "The Right to Education during Pandemic," New Education, 2020)
- The probability of misunderstanding theoretical knowledge - since there is a very large amount of information on the Internet, the probability is quite high that the student will misunderstand the existing material. This is because communication between students and professors is indirect (Tvalabeishvili, "The Right to Education during Pandemic," New Education, 2020)

Ghanaian Context

The concept of e-learning in Ghana traces back to nearly a decade. Ghana's efforts to integrate Information and Communications Technology (I.C.T) into the pre-tertiary education level to meet the aspirational goals of assisting the Z-generations in acquiring digital skills to achieve global standing received attention in the early 2000s with the implementation of Ghana's ICT for Accelerated Development (ICT4AD), which is aligned with the Education Strategic Plan and Sustainable Development Goals of 2018-2030 (Asabere et al., 2020; Otoo, 2020; Adarkwah, 2021; Tanye, 2017; Ofori-Birikorang et al., 2020; Asabere et al., 2017). Besides government Initiatives, many universities and colleges have developed digital platforms to supplement administrative and instructional activities through the use of the e-learning or blended Approach (Ansong et al., 2017; Sarfo & Yidana, 2016; Forson & Vuopala, 2019). University of Ghana, among other universities in Ghana, employed the online learning and management systems (LMS), which is a virtual learning tool for teaching and learning popularly known as SAKAI management systems through distance programs and remote learning among others (Ampadu & Sedofia, 2021; Tagoe & Cole, 2020; Asamoah, 2020;

Darko-Adjei, 2018). It appeared that these efforts were made as a strategic vision to flip the entire educational system into the digital space. Effective integration of e-learning is achieved when instructors and students have the competencies required to manage its operations and functionalities, which could be attained when the curriculum is tailored to embrace I.C.T in education and Train instructors towards it (Matthew et al., 2020). Frantically, all efforts to promote I.C.T in Ghana proved abortive as many schools in some areas across the country do not have the necessary infrastructure and resources to fully integrate I.C.T tools into the educational system for teaching and learning to leverage the digital gab (Tadesse & Muluye, 2020; Adarkwah, 2021, Soma et al., n.d).

Given the factors that impede the integration of I.C.T into education in Ghana, between 2009 and 2014, the Government of Ghana (GoG) has also introduced an intervention program dubbed 'One Laptop per Child Policy' to sustain the interest of pupils in ICT as well as enhance teaching and learning in basic schools by sharing over 450,00 RLG laptops (Adu Gyamfi, 2017) to most schools at the pre-tertiary level throughout the country (Ababio, 2010). According to Owusu-Ansah (2015), several schools have already benefited from the policy across the country. Factors such as Internet access, electricity, and infrastructure which has the potentials of thwarting efforts geared at integrating ICT into the educational system in Ghana were being managed slowly with plans at the point of critical considerations before the COVID-19 outbreak.

The sudden change from the Traditional face-to-face model to the online model of education and learning has posed serious challenges for instructors and students in Ghana (Aboagye et al., 2021; Serhan, 2020; Mseleku, 2020). The shift from the conventional mode of education to remote or online education was not adequately planned and many institutions' practices and attitudes towards digital platforms depict a completely unexpected occurrence without option (Salih & Omar, 2021; Di Giacomo & Di Paolo, 2021).

The sudden shift to the online mode of teaching and learning without prior preparations posed a greater challenge for both instructors and students with the use of the online systems post-COVID-19 teaching and learning practices in Ghana. This prompted the need to conduct a study to determine the challenges for improvement.

However, less than 15% of these teachers used the Internet as an innovative way of improving teaching and learning. Over 30% of the teachers also used the computer mainly for research work. Despite the limited use of computers by teachers in the teaching process, many agree that the computer has changed the way students learn.

Pre-existing Challenges Prior to the COVID-19 Pandemic

According to Collis and van der Wende (2002) and the Open and Distance Learning Paper (2004), the integration of e-learning in universities has been so far disappointing both at the macro-level of their strategic options and at the micro level of their educational work processes.

The online teaching and learning challenges are frequently attributed to the COVID-19 experiences, which is not the case. The pandemic revealed the hurdles and unreadiness of certain nations and institutions toward e-learning (Nikdel Teymori & Fardin, 2020). Collis and van der Wende (2002) claim that the integration of e-learning at universities has been unsatisfactory so far, both in terms of administrative strategic decisions and instructor-student level educational standard requirements.

Ali (2020) and Correia (2020) argued that COVID-19 revealed the vulnerabilities in today's e-learning educational system, which was kept behind the traditional and the blended methods. Nelson and Thompson (2005) reported that time management, workload, motivation, inadequate administrative support, cost of technological tools and management systems, students' interactions, and infrastructure posed a challenge to the efforts geared towards e-learning in most institutions among faculty members. They recommended that the administration should provide adequate resources and encourage the use of technology for teaching and learning by providing both pre-service and in-service training. Institutions should also should employ more distance education courses and limit the physical contact between instructors and students. Furthermore, promotions should be fashioned as an incentive to promote online engagement. Collaboratively, Bascow et al. (2012) postulated that the e-learning challenges form an integral part of the digital transformations as applications and systems continue to evolve. In their study, they believe that challenges such as technical challenges, lack of motivation and attitudinal challenges, nature of course content, high cost of adopting online learning, unemployment, among several others thwarts the full adoption of e-learning.

Similarly, Keengwe and Kidd (2010) disclosed that faculty members' involvement in e-learning remains a prevalent issue for most institutions planning to embrace e-learning. It was further revealed that most of the faculty members are reluctant to switch from the conventional method to online learning. 5% of active faculty in German-speaking universities use learning technologies in their courses. According to Barrios and Carstensen (2004), a threshold for e-learning integration shows that the recent Organization for Economic Cooperation and Development (2005) survey was confirmed at an international level. As a result, they labeled e-learning as a "thwarted innovation" in their study. Latchem, Jung, Aoki, and Ozkul (2007) claim that e-learning integration in Japanese higher education moves at the snail's pace.

In universities, technological advancements tend to outrun strategic thinking and pedagogical design, and the long-term integration of e-learning into higher education institutions remains a key issue. Although learners may have achieved success in traditional education and the classroom, this does not guarantee success in an online learning environment (Watkins et al., 2004). Amenyedzi et al. (2011) carried out research in Tema, Ghana's capital, to evaluate (i) the use of computers and the Internet as supplemental educational materials to improve school administration and planning; and (ii) how students utilize computers and the Internet to aid their learning. Students and instructors were chosen using the stratified sample approach. The findings revealed that a substantially 92% of respondent instructors were computer competent, while 78% of respondent learners had basic computer skills.

Many exploratory studies have been carried out to investigate the quality of online programs from different perspectives. Critical concerns impacting the quality of online education, such as communication, technology, time management, pedagogy, and assessment, have been recognized and studied (Bassoppo-Moyo, 2006; Conaway, Eston, & Schmit, 2005; Ko & Rossen, 2010; Limperos, et al., 2015)

According to Almaiah et al. (2020), the argument that obvious impediments such as instructors' technical challenges and lack of motivation are the sole reasons inhibiting the use of learning technologies is the most difficult to explain. According to them, the actual problem for e-learning is driven by macro-level influencing factors that stifle technology-enhanced innovation in higher education. This is because even if teachers are blamed, pre-service and in-service training will still be a factor. These underlying macro-level constraints are related to university structure weakness, availability and habitual features, and long-standing cultural values in the educational system (Almaiah et al., 2020).

The engagement of the online teacher may be divided into four categories: educational, social, managerial, and technological (Martin et al., 2019). Martin et al. (2019) conceded that pedagogical function focuses on educational facilitation, while the social role focuses on building a welcoming social atmosphere that is required for online learning. The managerial position includes agenda setting, pace, goal setting, regulation, and decision making, while the technical function is dependent on teachers getting familiar with the technology being utilized and then being able to communicate that degree of comfort to their learners (Martin et al., 2019).

According to Houshmandi et al. (2019), one factor for the delayed uptake of e-learning in higher education is the overwhelming number of faculty members' lack of e-competence. Hadley (2019) reviewed the following barriers to faculty participation in developing and teaching online courses: inadequate software and hardware, learner procrastination, slow Internet

connections, insufficient orientation for learners, lack of technical expertise among instructors, and a lack of release time for instructors to develop and design their courses online (Siga & Acharya, n.d).

Many researchers advocated for teacher training and assistance due to the large number of faculty members who begin their online teaching experience with minimal expertise in the process of conceiving, preparing, and delivering an online course. In this case, faculty support becomes critical (Albrahim, 2020).

Post-COVID-19 Challenges

The Internet has become a common medium for interaction, communication, and collaboration which allows learners and teachers to engage in unique and irreplaceable learning opportunities.

The literature on online learning and teaching in higher education has witnessed a growing interest in the study of key challenges in relation to the online mode of delivery besides the associated capacities (Siddiquei & Kathpal, 2021). Zhu and Liu (2020) observed that the Coronavirus outbreak has hastened the growth of online education in Chinese higher education. Big data, the Internet, 5G, Artificial Intelligence (AI), and cloud-based platforms, among other technologies, have been put to use in the field of education. However, Zhu and Liu (2020) maintained that a more flexible way of teaching and learning does not end up with infrastructure. This implies that infrastructure is only the first step towards a new paradigm of teaching and learning in a post-pandemic time. This paradigm, on the other hand, might reflect a rapid transition away from traditional, teacher-centered, and lecture-based activities and towards more student-centered activities such as group activities, dialogues, hands-on learning activities, and restricted usage of traditional teaching (Zhu and Liu,2020). This requires a conceptual and philosophical rethinking of the nature of teaching and learning, roles, and connections among teachers, learners, and teaching materials in post-digital learning communities (Jandrić et al., 2018). Full long-term integration of online teaching and learning into university curricula implies further attention to quality.

The imposition of e-learning without providing supporting infrastructure caused a significant setback to the fundamental essence of classical pedagogy, including learner's interactivity, access to study material, attentiveness, regularity, time management, and assessment (Manazir & Rubina, 2020). Similarly, broadly identified challenges with e-learning are accessibility, affordability, flexibility, learning pedagogy, life-long learning, and educational policy (Murgatrotd, 2020).

Challenges to online education reported in the medical literature so far include issues relating to time management, use of technology tools, students' assessment, communication, and the lack of in-person interaction.

Teachers are crucial for the inclusive and equitable provision of high-quality distance education. They are expected to have knowledge, skills, and ethics to conduct online teaching, which requires more flexible and dynamic post-pandemic teacher education. Post-pandemic national teacher education could be composed of face-to-face teacher education, blended teacher education, and online teacher education (Zhu, 2020). National online teacher education could be categorized into sections that provide learning opportunities to future teachers at all levels such as early childhood education, primary education, secondary education, vocational education sectors, etc. Online teacher education platforms could function as a traditional teacher education institute that provides pre-service and in-service programs. This could be supported by online platforms with rich digital materials and resources. Curriculum and pedagogy need to be updated and should become models of successful online pedagogies that could be taken into future teachers' practices. It is also critical to building up an enabling institutional environment for sustainable national online teacher education. Evidence-based policies need to be developed and supported by guidelines for their implementation. To provide a professional reference base for online teacher education, a framework of competencies to conduct online teaching, including other standards, should be developed. In the post-digital context, online and offline (teacher) education cannot be thought of without each other (Jandrić et al., 2018). Therefore, the development of a holistic teacher education system is needful, regardless of the used model of delivery, to support present and future teachers in becoming more resilient to a crisis similar to the COVID-19 pandemic. The COVID-19 pandemic has brought about a huge disruption to all spheres of human life. Chinese higher education and Beijing Normal University, in particular, have responded to the crisis with reasonable success. However, it is strongly believed that the impact of the COVID-19 pandemic on the Chinese education system should extend beyond tackling the current crisis. It should also bring out potential development opportunities for the future (Jandrić, 2020). The current situation requires innovation and renewed attention to more research, study, and reflection about each sector of education in China and globally. It is only by doing this research within the pandemic that a more sustainable, inclusive, and equitable education can be developed after the pandemic is gone.

Dumford and Miller (2018) argue that the students enrolled in online courses are often less engaged in collaborative learning, student-faculty communication, and discussion with their peers than their counterparts in traditional face-to-face courses. It has also been noted that major challenges

for online education include developing core professional qualities, namely; the acquisition of interpersonal and practical skills, communication skills, sustaining student retention rates, and effective use of online technologies. Challenges have also been raised by educators whilst adapting some activities, such as performance assessment to the virtual learning environment and avoiding the loss of content knowledge or effective interactions between learners and/or educators. The emergence of a range of learning scenarios and pedagogical models has extensively informed practices of online learning and teaching in the higher education context. Nevertheless, a less addressed challenge is "not whether online courses will replace classrooms, but whether technology will drive the redesign of teaching and education". Making clear distinctions between online and on-campus models of learning and teaching has been at the forefront of online education discourse. What matters here is to understand how to best support innovative and collaborative learning and teaching activities so as to utilize emerging instructional technologies regardless of the medium of delivery. It is also useful to understand what form of technology varies between online recorded lectures, in-built assessment, collaborative digital subjects with flexible learning environments, and remote simulation to enable a certain pedagogy or change the existing pedagogical model. Peimani and Kamalipour (2021) indicated that using new technology is not enough. Thus, new models must employ these tools and services to engage students on a deeper level. This also lends itself well to other researchers' arguments that giving primacy to technology over pedagogy is a barrier to successful technology integration, as well as effective teaching and learning strategies in higher education (Peimani & Kamalipour, 2021). Therefore, it is important to understand which course delivery model stands as the students' favored learning and teaching design: blended, fully face-to-face, or online choices.

Siddiquei and Kathpal (2021) reviewed challenges of online teaching and learning during COVID-19 and identified challenging factors such as infrastructure (electricity, Internet, facilities), students or learner challenges (interaction, participation, readiness, technical skills, and learning style), content issues (multimedia, pedagogy, innovation, content creation, and design), institutional factors (policies, incentives, resources), and motivational factors (salary, family support, mental and emotional) as crucial factors that affect teaching and learning online. Their findings highlighted that instructors' challenges emanated from the transition from offline to online, communication barriers regarding online teaching, preparations, and teaching style. They further highlighted factors such as training for instructors, multimedia and technical skills support, students' readiness, technological skills to learn online, learning styles, participation, and pace of learning and

network issues as pressing challenging factors associated with institutions and learners, respectively.

Corroboratively, Paudel (2021) surveyed 160 instructors and 120 students in Nepal to investigate their challenges during and after the COVID-19 pandemic. The results disclosed that online time management, freedom of interaction between students and instructors, and reliable Internet at home are the extreme challenges that most of the respondents outlined. Additionally, they found that the swift shift of responsibility from instructors to students in terms of learning remotely has the potency of causing social isolation, which impacted greatly students' mental health.

The afore-stated reviews are evidence of the challenges in the post-COVID-19 era due to the transition from face-to-face to e-learning.

Instructors' Challenges

The COVID-19 pandemic has affected many instructors during the swift shift to the e-learning platform. It has been established that many instructors were not technically ready for the transition. Thus, they could not exhibit skills and ideas to troubleshoot the issues that came along with e-learning. Even though many scholars identify challenges regarding other stakeholders and related factors, instructors' readiness and skills exhibited during online teaching cannot be overstated. It is instructive to note that aspects of the e-learning challenges trace back to the instructors and faculty members. For instance, Crompton et al. (2021) mentioned that instructors and faculty were confronted with the challenge to use, learn, and incorporate appropriate multimedia tools (that they had never used) to support their online instructions. This implies that instructors needed to learn how to skillfully handle the learning management system to deliver the online course, how to create and deliver learner-friendly instructional videos that met the accessibility requirements, or how to deliver the Hybrid courses, with part of the class in the classroom and the rest remotely on Zoom or asynchronous online learning platform. Furthermore, those challenges not only affected instructors but students' performance as well, which created challenges for them (Kaisara & Bwalya, 2021). Chopra et al. (2019) contended that the layout of an online course with poorly designed navigation was identified as one of the challenges faced by students, and the ease of navigation was found to be one of the most important predictors of e-learning success (Alshehri et al., 2019). Educators have been exploring methods to deal with the challenges caused by the COVID-19 emergency (Greenhow & Lewin, 2021).

At the beginning of the urgent transition in 2020, it was least anticipated that instructors who had not designed and taught any online course could achieve all the knowledge and skills and be equipped with the necessary technology tool in a short time frame (Liu et al., 2021). However, during the

pandemic period from March 2020 to August 2021, Liu et al. (2021) posited that educators have taken this emergency as an opportunity to adjust their teaching, update all their skills, become equipped with new technology tools, revise the teaching materials, redesign their online courses, and even produce more publications to share their experiences with other educators and researchers (Abu Talib et al., 2021; Crompton et al., 2021). One of the challenges that instructors encounter is assessment and evaluation. Instructors often experience so many barriers in diversifying their mode of assessment for students. The study of Abduh (2021) on instructors' perceptions and challenges of assessment methods used in full-time e-learning during and after the COVID-19 pandemic was reported after 26 instructors were asked to complete a survey and interview. The findings disclosed that instructors reported moderate attitude towards e-assessment. However, the responses indicated that instructors are confronted with tremendous challenges in assessing students online.

Students' Challenges

Students are the most affected group of individuals in the world's educational system as far as COVID-19 is concerned. As a result of the widespread of the COVID-19 pandemic, states initiated school closure measures to help contain the virus and preserve students' safety at school (Agormedah et al., 2020). Hence, the closure of schools, colleges, and universities has affected over 80% of students all over the world. In early 2020, approximately 1.7 billion learners were not attending school (Day, 2020; UNICEF, 2020; Crawford et al., 2020; Quinn, 2020; Ebrahim, 2020; UNESCO, 2020a; Kokutse, 2020). UNESCO (2020b) reported that over 191 countries have enforced total closure of schools and about five countries have initiated closure due to COVID-19 spread. This has affected close to 99.4% of the entire student population across the world. School closures have impacted several stakeholders, particularly students, which has resulted to economic and societal consequences (Lindzon, 2020; Barrett, 2020; Mitchell & Jamerson, 2020). The closure of schools has broadened learning disparities and has affected susceptible students disproportionately (UNESCO, 2020e).

To address this issue, some international organizations, particularly UNESCO, have approved the deployment of e-learning programs as well as open educational platforms and software that schools can use to reach learners remotely and limit disruptions to education. In response to these recommendations, schools around the world have begun to operate remotely via online platforms for emergency remote teaching and learning as part of measures to reduce the spread of COVID-19 (Crawford et al., 2020). Nonetheless, this has been hampered by the digital divide (Bozkurt & Sharma, 2020; UN, 2020; UNESCO, 2020c) due to inequalities among higher

educations and socioeconomic distinctions among students. Regarding this, many scholars questioned if higher education institutions are ready to move into the digital platform of teaching and learning (Houlden & Veletsianos, 2020).

Researchers have investigated this area with a focus on students' mental health, home learning experiences, virtual learning environment, self-regulation, and students' overall learning experience (Copeland et al., 2021; Fawaz et al., 2021; Suryaman et al., 2020; Carter et al., 2020; Almaiah et al., 2020; Hew et al., 2020; Tang et al., 2020; Adarkwah, 2021; Day et al., 2021; Khalil et al., 2020; Singh et al., 2020) to ascertain students challenges during the online learning platform. Copeland et al. (2020) study on the impact of the COVID-19 pandemic on the mental health of students found that the pandemic has impacted students' emotional and behavioral abilities, their attention span, and how well they externalize issues due to self-isolation related problems and confusion. They recommended that states and educational stakeholders should employ safety measures to mitigate the relative consequences of the COVID-19 pandemic on students' mental health and wellness. Corroboratively, Barrot et al. (2021) surveyed 200 university first-year students and discovered that the effects of the pandemic on student learning were dire. They further revealed that challenges associated with online learning varied significantly by extent and type. They maintained that the self-reported questionnaire revealed that the greatest challenges were environmental issues, technical challenges, inadequate learning resources, technological sufficient issues, self-isolation, and technological challenges in that order (Barrot et al., 2021).

Similarly, Suryaman et al. (2020) looked into how learning occurred at home during the pandemic. Their findings showed that students faced many obstacles in a home learning environment, such as lack of mastery of technology, high Internet cost, and limited interaction/socialization between and among students. In a related study, Kapasia et al. (2020) investigated how lockdown impacts students' learning performance. Their findings revealed that the lockdown made significant disruptions in students' learning experience. The students also reported some challenges that they faced during their online classes. These include anxiety, depression, poor Internet service, and unfavorable home learning environment, which were aggravated when students are marginalized from remote areas.

Pakistan Case
Online Education's Challenges
The COVID-19 outbreak compelled academic institutions and schools to move online. Online teaching tools, such as Skype Call, Vipers, ThingLink, Zoom, Google meet, and other video conferencing apps, were introduced to both teachers and students (Hamzah & Ahmad Shaberi, 2021; Sobaih et al.,

2021). However, moving from an offline to an online mode of learning poses a number of challenges for students and educators in both developed and developing countries (Liguori & Winkler, 2020). For instance, the key hurdles of online education in developing nations include insufficient ICT skills, poor network administration or IT skills, and insufficient content development capabilities (Aung & Khaing, 2015; Hadullo et al. 2018; Noor et al. 2020). In Kenya, a similar study found that three major barriers to online education adoption include insufficient IT infrastructure, weak ICT skills, and a lack of financial resources (Ngwacho, 2020; Almaiah et al., 2020). Another research by Kanwal and Rehman (2017) revealed that the main impediments to successful online education adoption in Pakistan was the absence of existing IT infrastructure, Internet availability, and computer literacy (Kanwal & Rehman 2017). According to Kenan et al. (2013), cultural, political, and economic obstacles were the key reasons for Libyan online education's failure. Kisanga and Ireson (2015) highlighted poor interface design, insufficient technical assistance, and a lack of IT skills as major hurdles to the successful implementation of existing e-learning projects in Tanzania.

Challenges from the Student's Perspective

From the perspective of the students, certain major factors influencing the adoption of online education during the Coronavirus pandemic have been documented in the literature. For example, Almaiah and Alyoussef (2019) and Al-Araibi et al. (2019) revealed that one of the major problems students experience is technological difficulty in using e-learning platforms such as Microsoft Team, Google Class, etc., which greatly reduces their willingness to adopt online education. Another issue is learners' lack of awareness of Internet skills (Al-Araibi et al., 2019). Specifically, research has noted that students have poor comprehension of Internet capabilities and are hesitant to take charge of their own e-learning. Almaiah et al. (2020) backed up this point of view, stating that due to varying levels of education among students, online education adoption seemed difficult.

Challenges from the Educator's Perspective

In a similar vein, certain important characteristics impacting the adoption of online education during the Coronavirus outbreak have been reported in the literature from the perspective of educators/universities. During the Coronavirus outbreak, for example, institutional preparation for online education was one of the most significant impediments to switching from offline to online education (Chung et al., 2020). Particularly, research has shown that the most significant reason for the failure of online education adoption in Malaysia, Saudi Arabia, and Iraq is the absence of university readiness (Chung et al., 2020; Budur et al., 2021; Alqabbani et al., 2020). This

viewpoint is supported by recent research which indicates that the lack of technology infrastructures, such as hardware, software, facilities, and networking is one of the major challenges for universities in developing nations to transition from offline to online education (Almaiah et al., 2020). Other challenges for educators that significantly hinder the adoption of online education according to studies by Bao (2020), Laato et al. (2020), Saxena et al. (2021), and Fatani (2020) include teaching quality, content localization, and lack of relevance of course content. Similarly, research has shown that faculty members' acceptance of online education (Li, 2021), faculty members' poor ICT literacy skills (Alanazi & Alshaalan, 2020; Duraku & Hoxha, 2020; Besser et al., 2020), and teachers' lack of effort and support in the adoption of online teaching (Almaiah et al., 2020) are all important barriers to online education adoption.

Conclusion

With the help of technologists, life has become much easier and more comfortable. Through modern technologies, the worldwide challenge of the COVID-19 pandemic was easier to accept and manage. In education, this was reflected in the transition to the online platform, which had been successfully implemented in many countries around the world before COVID-19.

However, for developing countries, full transition to the online space was quite a challenge. Whether the education system has coped with this challenge is still difficult to say. However, based on the current dynamics, it can be assumed that this test has been more or less successfully passed. Proper management of information requires proper analysis, which entails qualified academic staff. This is because they are better acquainted with the strategies and methods that are appropriate for different levels of higher education.

Information and communication technology has indeed played a significant role for people with disabilities. They were able to get the necessary information on any topic through platforms tailored to them. All of the above is closely related to the quality of teaching. Given the current reality, it can be said that access to higher education has increased significantly. This is evidenced by the abundance of digital technologies. Hence, in order to be successful, it is necessary to follow and keep up with the novelties.

In light of this review, Ghana, Georgia and Pakistan have endeavored to better study and understand the challenges and opportunities of teaching and learning during the pandemic from the students and educator perspectives. Preliminary results have been obtained and will become the subject of near future publications in order to help shape the future development of E-learning impact on the quality of teaching and learning.

As the quality of life improves, the needs of people evolve. This in turn requires constant development and advancement, with the help of

technologies. Education is a constantly evolving field requiring permanent innovations. The Fourth Industrial Revolution had a paramount impact on the digitalization of the world. This was one of the largest changes in the history of the world. The digital revolution transcends all boundaries in the biological and digital fields. Once again, it has become clear that human capabilities have no boundaries. Technologies such as Artificial intelligence, 3D printing or nanotechnology evolved (Schwab, 2016). When discussions about technology are raised, it is important not to leave out the issue of eliminating the geographical barrier. It is with the help of technology that the traditional teaching method has changed and become fully adapted to the student. With the help of digital platforms, they can get education at any time from the desired place. They also need the competencies and skills to help them easily adapt to a rapidly changing environment.

References:

1. Abduh, M. (2021). Full-Time Online Assessment during Covid-19 Lockdown: EFL Teacher's Perceptions. Asian EFL Journal Research Article, 28.
2. Aboagye, E., Yawson, J. A., & Appiah, K. N. (2021). COVID-19 and E-learning: The challenges of students in tertiary institutions. Social Education Research, 1-8. https://doi.org/10.37256/ser.212021422
3. Aborode, A., Anifowoshe, O., Ayodele, T. I., Iretiayo, A. R., & David, O. O. (2020). Impact of COVID-19 on education in sub-Saharan Africa. https://doi.org/10.20944/preprints202007.0027.v1
4. Adarkwah, M. A. (2021). "I'm not against online teaching, but what about us?": ICT in Ghana post Covid-19. Education and Information Technologies, 26(2), 1665-1685. https://doi.org/10.1007/s10639-020-10331-z
5. Addae, D., Amponsah, S., & Gborti, B. J. (2021). COVID-19 Pandemic and the Shift to Digital Learning: Experiences of Students in a Community College in Ghana. Community College Journal of Research and Practice, 1-12. https://doi.org/10.1080/10668926.2021.1972364
6. Adedoyin, O. B., & Soykan, E. (2020). Covid-19 pandemic and online learning: the challenges and opportunities. Interactive Learning Environments, 1-13. https://doi.org/10.1080/10494820.2020.1813180
7. Adu Gyamfi, S. (2017). Information and Communication Technology Acceptance in Education: A Study of Pre-service Teachers in Ghana (Doctoral dissertation, University of Lincoln). http://eprints.lincoln.ac.uk/id/eprint/35715/
8. Aduhene, D. T. & Osei-Assibey, E. (2021). Socio-economic impact of COVID-19 on Ghana's economy: challenges and

prospects. International Journal of Social Economics. https://doi.org/10.1108/IJSE-08-2020-0582

9. Alanazi, A. A. & Alshaalan, Z. M. (2020). Views of faculty members on the use of e-learning in Saudi medical and health colleges during the COVID-19 pandemic. Journal of Nature and Science of Medicine, 3(4), 308-317.

10. Al-araibi, A. A. M., Nazri bin Mahrin, M., & Yusoff, R. C. M. (2019). Technological aspect factors of E-learning readiness in higher education institutions: Delphi technique. Education and Information Technologies, 24(1), 567-590.

11. Albrahim, F. A. (2020). Online teaching skills and competencies. Turkish Online Journal of Educational Technology-TOJET, 19(1), 9-20. https://eric.ed.gov/?id=EJ1239983

12. Aliyyah, R. R., Rachmadtullah, R., Samsudin, A., Syaodih, E., Nurtanto, M., & Tambunan, A. R. S. (2020). The perceptions of primary school teachers of online learning during the COVID-19 pandemic period: A case study in Indonesia. Journal of Ethnic and Cultural Studies, 7(2), 90-109. http://dx.doi.org/10.29333/ejecs/388

13. Almaiah, M. A., Al-Khasawneh, A., & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic. Education and Information Technologies, 25, 5261–5280. https://doi.org/10.1007/s10639-020-10219-y

14. Almaiah, M. A. & Alyoussef, I. Y. (2019). Analysis of the effect of course design, course content support, course assessment and instructor characteristics on the actual use of the E-learning system. Ieee Access, 7, 171907-171922.

15. Almendingen, K., Morseth, M. S., Gjølstad, E., Brevik, A., & Tørris, C. (2021). Student's experiences with online teaching following COVID-19 lockdown: A mixed methods explorative study. PloS one, 16(8), e0250378. https://doi.org/10.1371/journal

16. Alqabbani, S., Almuwais, A., Benajiba, N., & Almoayad, F. (2020). Readiness towards emergency shifting to remote learning during COVID-19 pandemic among university instructors. E-Learning and Digital Media, 2042753020981651.

17. Amir, L. R., Tanti, I., Maharani, D. A., Wimardhani, Y. S., Julia, V., Sulijaya, B., & Puspitawati, R. (2020). Student perspective of classroom and distance learning during COVID-19 pandemic in the undergraduate dental study program Universitas Indonesia. BMC medical education, 20(1), 1-8. https://doi.org/10.1186/s12909-020-02312-0

18. Ampadu, E. & Sedofia, J. (2021). Covid-19 and Emergency Education Strategies in University of Ghana: Students' Challenges with Emergency Remote Learning. In Emergency Remote Learning, Teaching and Leading: Global Perspectives (pp. 103-119). Springer, Cham. https://doi.org/10.1007/978-3-030-76591-0_6

19. Ansong, E., Lovia Boateng, S., & Boateng, R. (2017). Determinants of e-learning adoption in universities: Evidence from a developing country. Journal of Educational Technology Systems, 46(1), 30-60. https://doi.org/10.1177%2F0047239516671520

20. Asabere, N. Y., Agyiri, J., Acakpovi, A., Nachanja, A., & Awuku, P. (2020). Improving education delivery in a technical university in Ghana through mobile learning technology. International Journal of ICT Research in Africa and the Middle East (IJICTRAME), 9(2), 35-59. https://doi.org/10.4018/IJICTRAME.2020070103

21. Asabere, N., Togo, G., Acakpovi, A., Torgby, W., & Ampadu, K. (2017). AIDS: An ICT model for integrating teaching, learning, and research in Technical University Education in Ghana. International Journal of Education and Development using ICT, 13(3). https://www.learntechlib.org/p/182160/

22. Asamoah, M. K. (2020). Reflections and refractions on Sakai/Moodle learning management system in developing countries: A case of Ghanaian universities' demand and supply perspective analyses. African Journal of Science, Technology, Innovation and Development, 12(2), 243-259. https://journals.co.za/doi/abs/10.1080/20421338.2019.1634318

23. Aung, T. N. & Khaing, S. S. (2015, August). Challenges of implementing e-learning in developing countries: A review. In International Conference on Genetic and Evolutionary Computing (pp. 405-411). Springer, Cham.

24. Bakradze, L. (2020). New Educational Reality, Terms, Challenges, Recommendations. Erasmusplus Blog.

25. Banji, G. T., Frempong, M., Okyere, S., & Raji, A. S. (2021). UNIVERSITY STUDENTS READINESS FOR E-LEARNING DURING THE COVID-19 PANDEMIC: AN ASSESSMENT OF THE UNIVERSITY OF HEALTH AND ALLIED SCIENCES, HO IN GHANA. Library Philosophy and Practice, 1-24. https://search.proquest.com/openview/86cde938cd009d1bdc29d1dbb3364525/1?pq-origsite=gscholar&cbl=54903

26. Barrett, S. (2020). Coronavirus on campus: College students scramble to solve food insecurity and housing challenges. CNBC. Retrieved from https://www.cnbc.com/2020/03/23/coronavirus-on-campus-students-face-food-insecurity-housing-crunch.html

27. Bashir, A., Bashir, S., Rana, K., Lambert, P., & Vernallis, A. (2021). Post-COVID-19 Adaptations; the Shifts Towards Online Learning, Hybrid Course Delivery and the Implications for Biosciences Courses in the Higher Education Setting. In Frontiers in Education (p. 310). Frontiers. https://www.frontiersin.org/articles/10.3389/feduc.2021.711619/full

28. Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. Human Behavior and Emerging Technologies, 2(2), 113-115.

29. Besser, A., Lotem, S., & Zeigler-Hill, V. (2020). Psychological stress and vocal symptoms among university professors in Israel: implications of the shift to online synchronous teaching during the COVID-19 pandemic. Journal of Voice.

30. Budur, T., Demir, A., & Cura, F. (2021). University Readiness to Online Education during Covid-19 Pandemic. International Journal of Social Sciences and Educational Studies, 8(1), 180-200.

31. Bozkurt, A. & Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis due to Coronavirus pandemic. Asian Journal of Distance Education, 15(1), 1-6. https://doi.org/10.5281/zenodo.3778083

32. Coman, C., Țîru, L. G., Meseșan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online teaching and learning in higher education during the coronavirus pandemic: students' perspective. Sustainability, 12(24), 10367. https://doi.org/10.3390/su122410367

33. Carter, R. A., Jr., Rice, M., Yang, S., & Jackson, H. A. (2020). Self-regulated learning in online learning environments: Strategies for remote learning. Information and Learning Sciences, 121(5/6), 321–329. https://doi.org/10.1108/ILS-04-2020-0114

34. Cheng, X., Chan, L. K., Pan, S. Q., Cai, H., Li, Y. Q., & Yang, X. (2021). Gross anatomy education in China during the Covid-19 pandemic: A national survey. Anatomical Sciences Education, 14(1), 8-18. https://www.researchgate.net/profile/Xin-Cheng-11/publication/347089401_Gross_Anatomy_Education_in_China_during_the_Covid-19_Pandemic_A_National_Survey/links/600e543e299bf14088bc618b/Gross-Anatomy-Education-in-China-during-the-Covid-19-Pandemic-A-National-Survey.pdf

35. Chidambaram, S. M. D. N. (2020). Success of online teaching and learning in higher education-COVID-19 pandemic: A case study, Valley View University, Ghana. International Journal of Applied

Engineering   Research, 15(7),   735-738.
http://www.ripublication.com/ijaer20/ijaerv15n7_17.pdf

36. Copeland, W. E., McGinnis, E., Bai, Y., Adams, Z., Nardone, H., Devadanam, V., & Hudziak, J. J. (2021). Impact of COVID-19 pandemic on college student mental health and wellness. Journal of the American Academy of Child & Adolescent Psychiatry, 60(1), 134–141. https://doi.org/10.1016/j.jaac.2020.08.466

37. Crawford, J., Butler-Henderson, K., Rudolph, J., Malkawi, B., Glowatz, M., Burton, R., Magni, P. A., & Lam, S. (2020). COVID-19: 20 countries' higher education intra-period digital pedagogy responses. Journal of Applied Learning and Teaching, 3(1)1-20. Retrieved from https://doi.org/10.37074/jalt.2020.3.1.7

38. Chung, E., Subramaniam, G., & Dass, L. C. (2020). Online learning readiness among university students in Malaysia amidst COVID-19. Asian Journal of University Education, 16(2), 46-58.

39. Darko-Adjei, N. (2018). Students' Perceptions and Use of the Sakai Learning Management System in the University Of Ghana (Doctoral dissertation,   University   of   Ghana). http://ugspace.ug.edu.gh/handle/123456789/26847

40. Day, M. (2020). COVID-19: Surge in cases in Italy and South Korea makes   pandemic   look   more   likely. https://www.bmj.com/content/368/bmj.m751.short

41. Day, T., Chang, I. C. C., Chung, C. K. L., Doolittle, W. E., Housel, J., & McDaniel, P. N. (2021). The immediate impact of COVID-19 on postsecondary teaching and learning. The Professional Geographer, 73(1), 1–13. https://doi.org/10.1080/00330124.2020.1823864

42. Di Giacomo, P. & Di Paolo, C. (2021). COVID-19 and dental distance-based education: students' perceptions in an Italian University. BMC medical education, 21(1), 1-9. https://doi.org/10.1186/s12909-021-02971-7

43. Duong, C. (2021). Implementing e-learning in Finnish higher education   during   the   Covid-19   pandemic. https://urn.fi/URN:NBN:fi:amk-2021091917867

44. Duraku, Z. H., & Hoxha, L. (2020). The impact of COVID-19 on education and on the well-being of teachers, parents, and students: Challenges related to remote (online) learning and opportunities for advancing the quality of education. Manuscript submitted for publication]. Faculty of Philosophy, University of Prishtina.

45. Ebrahim, N. (2020). How Canadian universities & colleges are responding   to   coronavirus.   Retrieved   from https://www.refinery29.com/en-ca/2020/03/9548653/canadian-university-college-closures-coronavirus

46. Fatani, T. H. (2020). Student satisfaction with videoconferencing teaching quality during the COVID-19 pandemic. BMC Medical Education, 20(1), 1-8.

47. Fawaz, M., Al Nakhal, M., & Itani, M. (2021). COVID-19 quarantine stressors and management among Lebanese students: A qualitative study. Current Psychology, 1–8. https://doi.org/10.1007/s12144-020-01307-w

48. Forson, I. K., & Vuopala, E. (2019). Online learning readiness: perspective of students enrolled in distance education in Ghana. The Online Journal of Distance Education and e-Learning, 7(4), 277-294. http://www.tojsat.net/journals/tojdel/volumes/tojdel-volume07-i04.pdf#page=24

49. García-Morales, V. J., Garrido-Moreno, A., & Martín-Rojas, R. (2021). The transformation of higher education after the COVID disruption: Emerging challenges in an online learning scenario. Frontiers in Psychology, 12, 196. https://doi.org/10.3389/fpsyg.2021.616059

50. Hadley, C. M. (2019). An investigation of faculty perceptions of online teaching: Barriers and LMS satisfaction (Doctoral dissertation). https://hdl.handle.net/2346/85941

51. Hadullo, K., Oboko, R., & Omwenga, E. (2018). Factors affecting asynchronous e-learning quality in developing countries university settings. International Journal of Education and Development using ICT, 14(1).

52. Hamzah, H. & Ahmad Shaberi, H. S. (2021). Teaching and learning using the online platform a new experience. International Journal of Practices in Teaching and Learning (IJPTL), 1(2), 1-5.

53. Henaku, E. A. (2020). COVID-19 online learning experience of college students: The case of Ghana. International Journal of Multidisciplinary Sciences and Advanced Technology, 1(2), 54-62. https://www.researchgate.net/profile/EugeneHenaku/publication/342586709_COVID19_Online_Learning_Experience_of_College_Students_The_Case_of_Ghana/links/5efbf4ca299bf18816f5fecb/COVID-19-Online-Learning-Experience-of-College-Students-The-Case-of-Ghana.pdf

54. Hew, K. F., Jia, C., Gonda, D. E., & Bai, S. (2020). Transitioning to the "new normal" of learning in unpredictable times: Pedagogical practices and learning performance in fully online flipped classrooms. International Journal of Educational Technology in Higher Education, 17(1), 1–22. https://doi.org/10.1186/s41239-020-00234-x

55. Hiltz, S. R. & Turoff, M. (2005). Education goes digital: The evolution of online learning and the revolution in higher

education. Communications of the ACM, 48(10), 59-64. https://doi.org/10.1145/1089107.1089139

56. Hondonga, J., Chinengundu, T., & Maphosa, P. K. (2021). Online Teaching of TVET Courses: An Analysis of Botswana Private Tertiary Education Providers' Responsiveness to the Covid-19 Pandemic Learning Disruptions. TVETonline Asia, 16, 1-14. http://tvet-online.asia/wp-content/uploads/2021/02/Hondonga-etal_issue16_TVET.pdf

57. Houlden, S. & Veletsianos, G. (2020). Coronavirus pushes universities to switch to online classes: But are they ready? The Conversation. Retrieved from https://theconversation.com/coronavirus-pushes-universities-to-switch-to-online-classes-but-are-they-ready-132728

58. Houshmandi, S., Rezaei, E., Hatami, J., & Molaei, B. (2019). E-learning readiness among faculty members of medical sciences universities and provide strategies to improve it. Research and Development in Medical Education, 8(2), 105-112. https://www.wsj.com/articles/student-loan-debt-relief-offers-support-to-an-economy-battered-by-coronavirus-11584735842

59. Jin, Y. Q., Lin, C. L., Zhao, Q., Yu, S. W., & Su, Y. S. (2021). A Study on Traditional Teaching Method Transferring to E-Learning Under the Covid-19 Pandemic: From Chinese Students' Perspectives. Frontiers in Psychology, 12. https://dx.doi.org/10.3389%2Ffpsyg.2021.632787

60. Johnson, N., Veletsianos, G., & Seaman, J. (2020). US Faculty and Administrators' Experiences and Approaches in the Early Weeks of the COVID-19 Pandemic. Online Learning, 24(2), 6-21. https://doi.org/10.24059/olj.v24i2.2285

61. Kanwal, F. & Rehman, M. (2017). Factors affecting e-learning adoption in developing countries–empirical evidence from Pakistan's higher education sector. IEEE Access, 5, 10968-10978.

62. Kebritchi, M., Lipschuetz, A., & Santiague, L. (2017). Issues and challenges for teaching successful online courses in higher education: A literature review. Journal of Educational Technology Systems, 46(1), 4-29. https://doi.org/10.1177%2F0047239516661713

63. Kenan, T., Pislaru, C., Othman, A., & Elzawi, A. (2013). The social impact and cultural issues affecting the e-learning performance in Libyan higher education institutes. International Journal of Information Technology & Computer Science, 12(1), 50-56.

64. Khalil, R., Mansour, A. E., Fadda, W. A., Almisnid, K., Aldamegh, M., Al-Nafeesah, A., & Al-Wutayd, O. (2020). The sudden transition to synchronized online learning during the COVID-19 pandemic in Saudi Arabia: A qualitative study exploring medical students'

perspectives. BMC Medical Education, 20(1), 1–10. https://doi.org/10.1186/s12909-020-02208-z

65. Kisanga, D. & Ireson, G. (2015). Barriers and strategies on the adoption of e-learning in Tanzanian higher learning institutions: Lessons for adopters. International Journal of Education and Development using ICT, 11(2), 126-137.

66. Klaus Schwab (2016). "What the Fourth Industrial Revolution means and how to respond to new challenges.

67. Kokutse, F. (2020). Ghana, Senegal close all universities. https://www.universityworldnews.com/post.php?story=20200315115 142951

68. Kundu, A. & Bej, T. (2021). COVID-19 response: students' readiness for shifting classes online. Corporate Governance: The International Journal of Business in Society. https://doi.org/10.1108/CG-09-2020-0377

69. Laato, S., Islam, A. N., & Laine, T. H. (2020). Did location-based games motivate players to socialize during COVID-19?. Telematics and Informatics, 54, 101458.

70. Leu, E. & Price-Rom, A. (2006). Quality of education and teacher learning: A review of the literature. Washington, DC: USAID educational quality improvement project, 1. https://pdf.usaid.gov/pdf_docs/Pnadh491.pdf

71. Li, B. (2021). Ready for online? Exploring EFL teachers' ICT acceptance and ICT literacy during COVID-19 in mainland China. Journal of Educational Computing Research, 073563311211028934.

72. Liguori, E. & Winkler, C. (2020). From offline to online: Challenges and opportunities for entrepreneurship education following the COVID-19 pandemic. DOI: 10.1177/2515127420916738

73. Lindzon, J. (2020). School closures are starting, and they'll have far-reaching economic impacts. Fast Company. https://www.fastcompany.com/90476445/school-closures-are-starting-and-they'll-have-far-reaching-economic-impact

74. Mahyoob, M. (2020). Challenges of e-Learning during the COVID-19 Pandemic Experienced by EFL Learners. Arab World English Journal (AWEJ), 11(4). https://ssrn.com/abstract=3652757

75. Maphosa, V. (2021). Factors influencing student's perceptions towards e-learning adoption during COVID-19 pandemic: A developing country context. European Journal of Interactive Multimedia and Education, 2(2), e02109. https://doi.org/10.30935/ejimed/11000

76. Martin, F., Budhrani, K., Kumar, S., & Ritzhaupt, A. (2019). Award-winning faculty online teaching practices: Roles and competencies. Online Learning, 23(1), 184-205. https://doi.org/10.24059/olj. v23i1.1329

77. Matthew, U. O., Kazaure, J. S., & Haruna, K. (2020). Multimedia Information System (MIS) for Knowledge Generation and ICT Policy Framework in Education: Innovative Sustainable Educational Investment. International Journal of Information Communication Technologies and Human Development (IJICTHD), 12(3), 28-58. https://doi.org/10.4018/IJICTHD.2020070102

78. Means, B. & Neisler, J. (2020). Suddenly online: a national survey of undergraduates during the COVID-19 pandemic. Digital Promise. http://hdl.handle.net/20.500.12265/98

79. Mitchell. J. & Jamerson, J. (2020). Student-loan debt relief offers support to an economy battered by coronavirus. Wall Street Journal. ISSN 0099-9660.

80. Mohamedbhai, G. (2020). COVID-19: What consequences for higher education in Africa. International Higher Education, 102, 30-32. https://www.internationalhighereducation.net/api-v1/article/!/action/getPdfOfArticle/articleID/2918/productID/29/filename/article-id-2918.pdf

81. Mseleku, Z. (2020). A literature review of E-learning and E-teaching in the era of Covid-19 pandemic. SAGE, 57(52), 588-597. https://ijisrt.com/assets/upload/files/IJISRT20OCT430.pdf

82. Natia, J. & Al-hassan, S. (2015). Promoting teaching and learning in Ghanaian Basic Schools through ICT. International Journal of Education and Development using ICT, 11(2). https://www.learntechlib.org/p/151844/

83. Ngwacho, A. G. (2020). COVID-19 pandemic impact on Kenyan education sector: Learner challenges and mitigations. Journal of Research Innovation and Implications in Education, 4(2), 128-139.

84. Noor, S., Isa, F. M., & Mazhar, F. F. (2020). Online Teaching Practices during the COVID-19 Pandemic. Educational Process: International Journal, 9(3), 169-184.

85. Ofori-Birikorang, A., Hayford, S. A., Dampson, D. G., Hammond, C., Amo-Mensah, M., Amponsah, E. K., & Addai-Mununkum, R. (2020). EDUCATION FOR SUSTAINABLE DEVELOPMENT AND GLOBAL CITIZENSHIP: A SITUATION ANALYSIS OF GHANA'S EDUCATION LAWS, STANDARDS AND BASIC SCHOOL CURRICULUM. International Journal of Psychology and Education, 4(4). http://journals.uew.edu.gh/index.php/ijope/article/view/22

86. Otoo, L. B. (2020, December 8). The impact of ICT training in basic schools. The Business & Financial Times. https://thebftonline.com/2020/12/07/the-impact-of-ict-training-in-basic-schools/

87. Owusu-Ansah, S. (2015). One laptop per child policy in Ghana: Any impact on teaching and learning. Library Philosophy and Practice, 1-20. http://digitalcommons.unl.edu/libphilprac/1290

88. Paudel, P. (2021). Online education: Benefits, challenges and strategies during and after COVID-19 in higher education. International Journal on Studies in Education, 3(2), 70-85. https://doi.org/10.46328/ijonse.32

89. Peimani, N. & Kamalipour, H. (2021). Online Education in the Post COVID-19 Era: Students' Perception and Learning Experience. Education Sciences, 11(10), 633. https://doi.org/10.3390/educsci11100633

90. Pokhrel, S. & Chhetri, R. (2021). A literature review on impact of COVID-19 pandemic on teaching and learning. Higher Education for the Future, 8(1), 133-141. https://doi.org/10.1177%2F2347631120983481

91. QQI (2020)

92. Quinn, C. (2020). COVID-19: US universities scramble to arrange campus closures. https://thepienews.com/news/covid-19-us-campus-closures/

93. Rajab, M. H., Gazal, A. M., & Alkattan, K. (2020). Challenges to online medical education during the COVID-19 pandemic. Cureus, 12(7). https://dx.doi.org/10.7759%2Fcureus.8966

94. Salih, A. A. & Omar, L. I. (2021). Season of Migration to Remote Language Learning Platforms: Voices from EFL University Learners. International Journal of Higher Education, 10(2), 62-73. https://doi.org/10.5430/ijhe.v10n2p62

95. Sarfo, F. K. & Yidana, I. (2016). University lecturers experience in the design and use of MOODLE and blended learning environments. The Online Journal of New Horizons in Education, 6(2), 143-154. http://www.tojned.net/journals/tojned/volumes/tojned-volume06-i02.pdf#page=150

96. Saxena, C., Baber, H., & Kumar, P. (2021). Examining the moderating effect of perceived benefits of maintaining social distance on e-learning quality during the COVID-19 pandemic. Journal of Educational Technology Systems, 49(4), 532-554.

97. Serhan, D. (2020). Transitioning from face-to-face to remote learning: Students' attitudes and perceptions of using Zoom during COVID-19 pandemic. International Journal of Technology in Education and

Science, 4(4),   335-342.
https://scholar.archive.org/work/rnosjknmdfgivbl5zfuqizusxm/access/
wayback/https://ijtes.net/index.php/ijtes/article/download/148/pdf

98. Siddiquei, M. I. & Kathpal, S. (2021). Challenges of online teaching during Covid-19: An exploratory factor analysis. Human Behavior and Emerging Technologies. https://doi.org/10.1002/hbe2.300

99. Siga, M. D. & Acharya, P. K. (n.d). A REVIEW ON CHALLENGES OF ONLINE TEACHING IN HIGHER EDUCATION DURING COVID19 PANDEMIC. https://doi.org/10.1177/0022034520914246

100. Singh, K., Srivastav, S., Bhardwaj, A., Dixit, A., & Misra, S. (2020). Medical education during the COVID-19 pandemic: a single institution experience. Indian Pediatrics, 57(7), 678–679. https://doi.org/10.1007/s13312-020-1899-2

101. Sobaih, A. E. E., Salem, A. E., Hasanein, A. M., & Elnasr, A. E. A. (2021). Responses to Covid-19 in higher education: Students' learning experience using Microsoft teams versus social network sites. Sustainability, 13(18), 10036.

102. Soma, A., Nantomah, I., & Adusei, R. (n.d). The Challenges Facing the Integration of ICT in Ghanaian Educational System: A Systematic Review of Literature. http://45.113.122.54/pdfs/ijhsse/v8-i11/1.pdf

103. Suryaman, M., Cahyono, Y., Muliansyah, D., Bustani, O., Suryani, P., Fahlevi, M., & Munthe, A. P. (2020). COVID-19 pandemic and home online learning system: Does it affect the quality of pharmacy school learning? Systematic Reviews in Pharmacy, 11, 524–530. https://doi.org/10.31838/srp.2020.8.74

104. Tadesse, S. & Muluye, W. (2020). The impact of COVID-19 pandemic on education system in developing countries: a review. Open Journal of Social Sciences, 8(10), 159-170. https://doi.org/10.4236/jss.2020.810011

105. Tagoe, M. A. & Cole, Y. (2020). Using the Sakai Learning Management System to change the way Distance Education nursing students learn: are we getting it right? Open Learning: The Journal of Open, Distance and e-Learning, 35(3), 201-221. https://doi.org/10.1080/02680513.2019.1704232

106. Tang, T., Abuhmaid, A. M., Olaimat, M., Oudat, D. M., Aldhaeebi, M., & Bamanger, E. (2020). Efficiency of flipped classroom with online-based teaching under COVID-19. Interactive Learning Environments, 1–12. https://doi.org/10.1080/10494820.2020.1817761

107. Tanye, H. A. (2017). Quality eLearning in Distance Learning: Benefits and Implications for National eLearning Policy in Ghana. International Journal of Multicultural and Multireligious Understanding, 4(3), 1-11. http://dx.doi.org/10.18415/ijmmu.v4i3.73

108. UN (2020). Startling disparities in digital learning emerge as COVID-19 spreads: UN education agency. Retrieved from https://news.un.org/en/story/2020/04/1062232

109. UNESCO (2020a). COVID-19: Educational disruption and response. Paris, France: UNESCO. Retrieved from https://en.unesco.org/covid19/educationresponse

110. UNESCO (2020b). Adverse consequences of school closures. Paris, France: UNESCO. Retrieved from https://en.unesco.org/covid19/educationresponse/consequences

111. UNESCO (2020c). Coronavirus deprives nearly 300 million students of their schooling. Paris, France: UNESCO. Retrieved from https://en.unesco.org/covid19/educationresponse

112. UNESCO (2020f). Startling digital divides in distance learning emerge. Paris, France: UNESCO. Retrieved from https://en.unesco.org/news/startling-digital-divides-distance-learning-emerge

113. UNESCO Report. (2020). COVID-19 educational disruption and response. UNESCO.

114. Zheng, M., Bender, D., & Lyon, C. (2021). Online learning during COVID-19 produced equivalent or better student course performance as compared with pre-pandemic: empirical evidence from a school-wide comparative study. BMC medical education, 21(1), 1-11. https://doi.org/10.1186/s12909-021-02909-z

115. Zhu, X. & Liu, J. (2020). Education in and after Covid-19: Immediate responses and long-term visions. Postdigital Science and Education, 2(3), 695-699. https://doi.org/10.1007/s42438-020-00126-3