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Online Teaching During COVID-19: Exploration of Challenges and Their Coping Strategies Faced by University Teachers in Pakistan

Zafarullah Sahito[1], Sayeda Sapna Shah[1] and Anna-Marie Pelser[2]*

[1] Department of Education, Sukkur IBA University, Sukkur, Pakistan, [2] Faculty of Economic and Financial Sciences, North-West University, Potchefstroom, South Africa

The provision and practice of an online environment have become the main challenge for many institutes including universities during the COVID-19 pandemic. However, the use of an online learning system was used by the majority of the teachers through an understanding of the adoption of ICT with the major challenges faced by them during the teaching–learning process. It has been found through this study that the teachers are lacking in ICT literacy. Therefore, they are facing online classroom management and connectivity issues throughout their journey during COVID-19. This study aims to explore the challenges and coping strategies faced by university teachers during the pandemic of COVID-19. A qualitative research method with a case study approach was used to get an in-depth understanding of the phenomenon of online teaching during COVID-19. Interviews were collected from eleven teacher educators (TEs) of the university. After analyzing the data, nine themes were generated with major findings, that is, connectivity issues, online teaching methods and techniques, learning environment for online teaching and learning, and challenges faced by teachers. The study findings are a good sought of addition and contribution for the university policymakers to evaluate, influence, and ensure the successful implementation of the e-learning system. Additionally, it is a suggestion for the university management to arrange some workshops or training programs for TEs to improve productivity and performance during their online teaching.

Keywords: online teaching, COVID-19, coping strategies, challenges, connectivity, ICT skills

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****Correspondence:***
Zafarullah Sahito
zafarullah.sahito@gmail.com

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INTRODUCTION

In December 2019, a local outbreak of "pneumonia" that was previously unfamiliar, was found in Wuhan city of China, and was rapidly determined to be caused by a novel coronavirus (Dong et al., 2020). After China, it spread to other countries, which is still uncertain (Lau et al., 2020a). Moreover, the World Health Organization (WHO) confirmed the disease coronavirus (COVID-19) as a public health emergency. In February 2020, a total of 81,109 COVID-19 cases were confirmed and recorded through laboratory tests worldwide (Guan et al., 2020). COVID-19 spread almost all over the world (Bai et al., 2020), which raised fears, anxiety, and worries among people that destroyed every area of human life including education around the world (Paudel, 2020). The virus forced all systems, especially the education system to move from physical to online through a rapid transition to distance learning to reduce the impact of the virus on all stakeholders. To better control

and avoid the spread of the virus, online teaching has become a necessary strategy to restore regular instruction during the COVID-19 pandemic (Chen et al., 2020), where many universities conducted online classes for their safety from COVID-19 (Lei et al., 2021).

Everyone tried their level best to respond to the closure differently with the existing learning methods such as mobile learning, E-learning, and flip classrooms (Almaiah et al., 2020). Similarly, Martin et al. (2019) define online learning as the use of the internet to gain access to teaching materials; interact with knowledge and learners; to gain support in the learning process; and create personal meaning and get success from the learning experiences. Online teaching and learning are part of an educational process that takes place through the internet, which is the medium of distance teaching and learning experiences for both teachers and learners from various places (Kim, 2020). Before the pandemic of COVID-19, e-learning was considered a non-formal activity, but right after the lockdown, it was considered as the need to continue the education system virtually. This online teaching and learning has many educational applications in post-COVID-19, such as Neo, Zoom, Start.me, Google Classroom, Shift, Ted-Ed, Lan School, Blackboard, Edmodo, Class Dojo, Outs, We Video, and many more (Mishra et al., 2020). These apps are very useful to continue the online teaching and learning process even after the pandemic. The quick shift toward the virtual environment brought some challenges for learners and instructors as well, which has been found in a study conducted in the United States that many teachers are beginning to transform their traditional (face-to-face) teaching into an online environment (Hixon et al., 2012) while facing some challenges (Simamora, 2020). Online teaching addresses the issues related to geographical distance and for many other reasons makes the teaching and learning process unproductive (Granena and Yilmaz, 2019; Singh and Thurman, 2019). However, due to the sudden emergence of COVID-19, most of the faculty members are facing issues and challenges like the lack of online tutoring experience, pre-preparation, or support from an educational technology as it requires lesson plans, different teaching materials like audio, video material, and technology support (Bao, 2020).

Due to COVID-19, the majority of the institutes of the world were closed and transferred all their educational activities from traditional to virtual classes. Pakistan, along with other countries has closed all its educational institutes and is trying its best to fulfill the educational loss during the pandemic of COVID-19 (Sahito and Chachar, 2021). To reduce the loss of education systems, many countries are looking for alternatives that could introduce distance learning to manage and tackle the crisis. In this connection, the World Bank (WB) is partnering with the Ministry of Education in several countries to support their efforts to provide distance learning opportunities for learners (Sahito and Chachar, 2021). Pakistan introduced online education with the support of different stakeholders after having many meetings conducted by the Higher Education Commission (HEC), universities, and other concerned government departments. After starting online classes, the main problem was identified that students, teachers, and administrators have low internet access and lack ICT skills (Sahito and Chachar, 2021). According to the Economist Intelligence Unit (EIU), Pakistan ranks 76 out of 100 countries in terms of availability, affordability, and the ability of people to use the web (Reports, 2021). Pakistan is the fourth largest country in the world with inexpensive or inaccessible internet (Khan, 2019). Therefore, this study is designed to explore the challenges of online teaching faced by university teachers during the pandemic of COVID-19 and their coping strategies in the context of Pakistan. Whereas, some objectives and research questions have been developed to explore the answers to the questions, respectively, to understand the phenomena, for instance: (a) To understand the perception of university teachers about online teaching during COVID-19. (b) To identify the challenges faced by university teachers during online teaching in the COVID-19 period. (c) To explore the coping strategies to overcome challenges of online learning during COVID-19. While the research questions were as follows: (a) What is the perception of university teachers about online teaching during COVID-19? (b) What challenges, issues, and problems are faced by university teachers during online teaching during COVID-19 period? (c). How do university teachers cope to overcome the issues, challenges, and problems of online learning during COVID-19?

As the lockdown ended in most countries, the results of this study would be a good lesson for the institutions and the faculty members to continue their teaching–learning processes by dealing with the challenges and issues that occurred in any difficult situations. Whereas, the developed countries have sound resources to deal with difficult situations, the developing countries are much more behind them to deal with critical situations. Therefore, the findings of this study would be more beneficial for them to learn new techniques of the solutions to their problems within the limited resources.

LITERATURE REVIEW

Online learning is defined as distance learning with the help of electronic devices, for example, tablets, smartphones, laptops, and computers, that require an internet connection (Gonzalez and Louis, 2018; Abbas et al., 2021b). However, the studies in the related literature show the need for the readiness of countries in situations like a pandemic toward education. The global spread of COVID-19 has led to the suspension of classes for more than 850 million students worldwide, disturbing the original teaching plans of schools in all countries and regions (Chen et al., 2020). In the pandemic situation, the students were not allowed to go to school by their governments, institutions, and parents (Abbas et al., 2021a), which was alternated with a shift from traditional education to online education (Basilaia and Kvavadze, 2020). The online library, television broadcasts, guidelines, resources, lectures, and video channels are available online in at least 96 countries (UNESCO, 2020). Additionally, Google had announced that it would offer enterprise video conferencing features such as large meetings for up to 250 people and free recording functionality for G-Suite for Education customers from 1 July 2020. Furthermore, Zoom had removed

the video time limit and increased this by accepting the request from China, US, Italy, and Japan. In many countries, selecting the online educational platforms provide chances for university students, teachers and other concerned stakeholders to increase the collaborations and get experience from digitalization (Rowe, 2016). In these years, higher education associations have developed progressively to offer online courses as a major aspect of their curriculum, which is giving access to a wide range of viewers, audiences, and participants to improve, increase, and enhance the learning for educational forms (Soffer and Cohen, 2019). Most of the important elements of online courses are participant engagement and evaluation of the course on low cost and budgets. An advantage of the online course is that it gives the opportunity of strong linkage to the community of participants toward the engagement, participation, integration, and collaboration of course activities (Tanis, 2020) to bring innovation to learning. Online teaching opportunities develop the knowledge and experiences of the teachers to improve the basic qualities of graduates and their programs through social media and many new collaborative online technologies, which are gradually embedded in higher education to make learners familiarized with the context of learning in open online spaces (Rowe, 2016).

Many researchers have compared the results between traditional (face-to-face interaction) and online education for university students, which revealed that the students who have a poor educational background or had lower grades in their previous academic records, perceive online education as a mess of the learning process (Jaggars and Xu, 2016). Similarly, Soffer and Cohen (2019) highlighted that online education increases the dropout ratio of students in the learning process, which can be the cause of failure and social isolation of a learner and economic loss (Lee et al., 2013). In this connection, Palvia et al. (2018) shared their point of view in another way that students who attend online classes have skills to learn individually, they accept diversity, they are much cooperative, and they prefer to work collaboratively. An advantage is that online learning removes social and physical limitations and barriers of the students (Palvia et al., 2018), which is the proper and authentic solution to the problems of the individuals who face issues and problems when delivering high-quality education on their choice of place and time (Lau et al., 2020b).

The role of ICT in teaching, especially in higher education, cannot be reduced (Sahito and Vaisanen, 2017), which is found to be good and supportive for teachers and students (Aljaraideh and Bataineh, 2019). Online learning literature identifies two main reasons that students take online courses: (a) The online delivery model offers greater flexibility and convenience to fulfill all obligations, needs, and requirements of work and family (Xu and Xu, 2019). (b) The challenge associated with online learning is access to ICT resources, as e-learning thrives on the availability of ICT facilities (Arthur-Nyarko and Kariuki, 2019). There is the issue of access to ICT among the different locations of students, households, and areas because the internet, especially 3G networking systems are not the same everywhere (Lembani et al., 2020). ICT issues are not only common in students and areas but are common in teachers' instructions because ICT is not fully adopted in the process of teaching and learning in most educational institutions (Ghavifekr et al., 2016). Challenges of ICT and e-learning depict all these facts in technologically advanced countries and low economic countries (Sahito and Vaisanen, 2017). This is because both developed and developing countries were facing different challenges, issues, and problems during the pandemic of COVID-19. The main difference is the students' and teachers' willingness to accept and use the e-learning system to progress significantly (Almaiah et al., 2016). Previous literature highlighted many challenges of online teaching and learning, which were classified into four categories such as individual challenges, course challenges, teaching challenges, and cultural challenges that vary from country to country because of their different contexts and readiness (Sahito and Vaisanen, 2017). Connectivity issues, lack of ICT knowledge, content delivery, and students' IT skills were found to be the main challenges during the implementation of online learning in developing countries (Aung and Khaing, 2015). Similarly, Kanwal and Rehman (2017) highlighted that the Pakistani education system has three main challenges in digitization such as computer self-efficacy, system characteristics, and internet experience. Another study suggested that the technical issues, which are the key to the success of e-learning systems, indicate that 45% of e-learning projects in developing countries are complete failures, 40% are partial failures, and only 15% are successful (Al-Araibi et al., 2019). However, the faculty and students say that with an online learning model, they are unable to teach and learn both practical and clinical subjects (Mukhtar et al., 2020) because they can teach and assess the knowledge component only. There is no immediate feedback, teachers cannot assess students' understanding during online lectures, students have limited attention spans and are intense toward online learning characteristics, which were supported by teachers that during online classes, students misbehave and attempt access to online resources during assessments (Mukhtar et al., 2020).

In the theoretical framework (**Figure 1**), online education is shown as interactive and effective for the teaching and learning process, which is highlighted by Lou (2008) that the rapid growth and development of ICT in teaching has emerged to methods like problem-based learning, case-based learning, interactive learning, task-based learning, and construct of theory belongs to social constructivism suggested by Kim (2001). Moreover, in online classes, most of the teachers try to use a constructivist approach like group work, learner-centered, pair work, cooperation, and project work and its process emphasizes inferential meaning, generates opinions, and develops critical thinking (Paudel, 2020). Where, Visual-Spatial Intelligence can understand patterns of space (Smith, 2002) to understand visual-spatial intelligence and multiple intelligence through the development of capabilities of learners during online education in different terms like art, drawing, jigsaw puzzles, map reading, project making, illusion, illustrations, musician, and naturalistic. The students and teachers can accurately perceive the world due to their sensitivity to visual-spatial aspects, video conferencing, 3D modeling, videos, TV programs, multimedia, and text with images/diagrams/graphics that can be the best tools to unleash

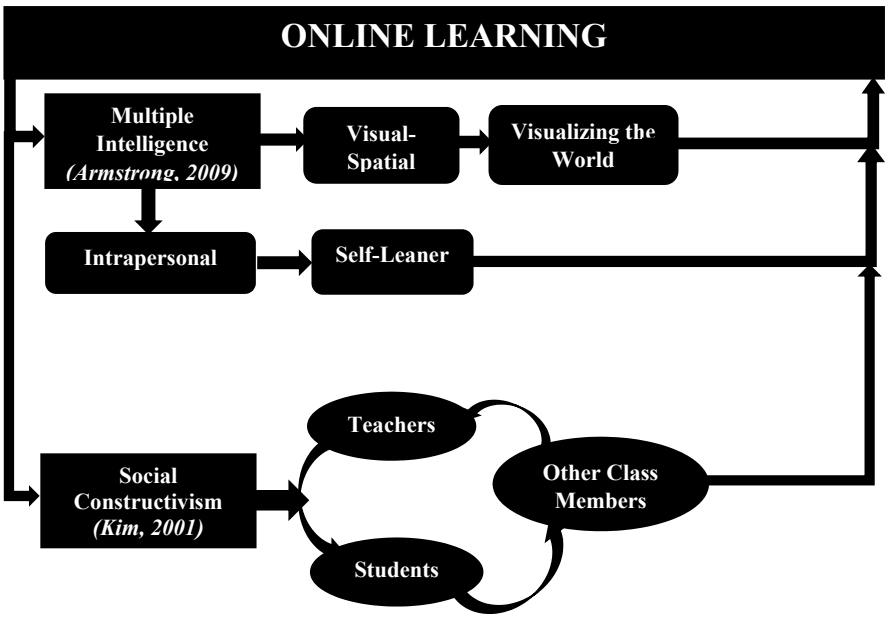

FIGURE 1 | Theoretical Framework made by authors with the help of Kim (2001), Armstrong (2009).

their creativity (Paudel, 2020; Sahito and Vaisanen, 2021). Due to their ability to orient themselves in any online activities, they can represent a graphical demonstration by showing their creativity in shapes, colors, lines, and forms (Armstrong, 2009).

MATERIALS AND METHODS

Philosophical Stance

This study employed multiple intelligence and constructivist approaches as its theoretical framework to explore the teachers' and students' challenges and the possible strategies to be adopted during and after COVID-19 in the higher education institutions of Pakistan. The overall picture of a research activity consists of the model linking theoretical values as a specific paradigm (Sarantakos, 2013) of constructivism called a worldview (Creswell, 2014), which is also used by many researchers (Mertens, 2010; Lincoln et al., 2011) and is connected with epistemology (Crotty, 1998) that is broadly conceived as a research methodology (Neuman, 2009).

Research Method and Approach

A qualitative research method was used for this study to gain an in-depth understanding of the online instruction during COVID-19, which allows the researchers to ask open-ended questions from the participants for in-depth statements depending on words, ideas, opinions, etc. (Creswell, 1994, 2014). This approach is used to gain a better understanding of the existing problem in which researchers begin with a general idea and use it as a medium to identify issues that may be of focus for future research. Social constructionism has been used as a philosophical position in which every individual seeks knowledge according to their personal experiences. The researchers believe that every individual has a way to explore the world. Therefore, qualitative research gives an in-depth knowledge of what they experience. The case study approach was used because researchers wanted to explore the phenomenon of online teaching and learning during the COVID time, as Yin (2018) highlighted that case study research is a qualitative approach in which the investigator explores a bounded system (a case) or multiple bounded systems (cases) over time through detailed and in-depth data collection procedures and involves multiple sources of information like observation and document analysis.

Data Collection and Analysis

The data were collected from (n = 11) teacher educators (TEs) through semi-structured interviews and the available documents were also analyzed to make the data authentic. The data were analyzed through a thematic analysis strategy, which is a suitable method for finding, analyzing, and reporting patterns of themes within the data (Braun and Clarke, 2006). All conducted interviews were transcribed first, then responses were distributed in different chunks, and such chunks were given the codes to generate the scientific themes. However, the first step in the thematic analysis was to get familiar with the data, which involves the detailed transcription of the collected data. After the coding process, all codes have been combined to form some comprehensive and scientific themes, which have been reviewed, revised, and finalized. Moreover, some categories fall into each other, and then nine themes were founded and finalized, which were refined and defined again to use for final analysis and report writing. The trustworthiness of the data and results were checked through member checks from the interviewees, and then the results were sent to experts

in the field for confirmability as an audit trail suggested by Lincoln and Guba (1985).

RESULTS

Interviews allow the researcher to listen to the different, attractive, and meaningful stories of TEs. In this study, eleven (11) TEs were interviewed and found to be impressive in constructing the true primary data for this study to analyze into a narrative and then create a theme. Additionally, the names of participants were kept confidential as per the agreement signed before conducting the interviews. The participants' names were replaced with teacher educator codes like (TE-1), (TE-2), or TE (3), and so forth, moreover, the essential narratives were recorded, selected, and encoded to analyze the data of the study.

Perception of Teacher Educators About Online Classes

The perception about online classes was extracted from the data in which 64% of TEs perceived that online classes are not the proper and authentic replacement for face-to-face classes. It was found that face-to-face classes have more interaction among students and teachers, which provides more opportunities to discuss everything than online classes. However, TEs perceive online classes as a kind of replacement for relaxation in the educational process, which can be conducted at their ease and in favorable places and times. **Table 1** provides a complete perception in detail through direct statements of TEs about online classes during COVID-19.

Readiness of Teacher Educators for Online Classes or Learning

About 90% of the TEs perceived holistic development as a key skill that they needed the most in their personal and professional life (**Table 2**). They perceived ICT skills as an honor and special need during the time of COVID-19. It is not only essential for TEs but necessary for students, a majority of whom do not know the usage of ICTs in online classes. Therefore, the holistic development and readiness of ICT of TEs and students are required to conduct online classes smoothly for better learning to take place.

About 90% of the TEs showed their readiness for online classes, which was found theoretically but the majority of them were not found practically ready for the sudden shift toward online classes. The TEs maintained their readiness with the passage of time, training, counseling, and guidance. The sudden shift toward digitalization harmed the teachers' and students' lives because they were not fully prepared for the immediate shift. The TEs and students were facing different challenges, issues, and problems with online classes because they did not attend the classes for getting an education but for "off learning," which was not enjoyable to them due to its issues and challenges.

TABLE 1 | Perception of TEs.

Items	Statements
Effectiveness of online classes	Online classes are a blessing for learners, especially in COVID time (TE-11)
	I support online teaching in the COVID period (TE-06)
	Virtual classes are good because of their relaxation and comfort (TE-01)
	Online classes are not more effective as face-to-face classes are (TE-02)
	Face-to-face interaction in the classroom gives more opportunities to learn and accrue skills (TE-07)
	Online classes are not very effective in our context like Pakistan because we do not have a big enough budget to deal with the expenses (TE-10)
	Online classes are not a substitute for face-to-face classes (TE-08)

TABLE 2 | Readiness of TEs.

Items	Statements
ICT literacy	You know, we teachers are not using ICT as we should use it (TE-10)
	Digital literacy is one of my interested areas and the institute has to operate (TE-03)
	Students were unaware of ICT literacy, they even struggled to mute and unmute themselves (TE-09)
ICT skills	Teachers need perfect skills in ICTs while attending online lectures (TE-05)
	Holistically development of ICTs is required for teachers in online teaching (TE- 01)
	ICT is becoming a part of the teaching and learning process (TE-08)
	It was a very challenging job to work on technology because we were not very much skilled at using the internet and using different media (TE-02)
	It also gives us time as educators and as a pedagogue to explore our; in specific those lacking areas where we can develop our competencies in terms of teaching and learning (TE-11)
	I've never actually used the ICTs because I never needed to use them (TE-04)
	You know, we teachers are not very skilled, especially in technology (TE-07)
Readiness of TEs	Students were not ready to attend virtual classes (TE-04)
	Students do not attend classes for the sake of learning. They attend classes to only pass the content (TE-07)
	Students preferred my (teachers') role more in online classes (TE-08)
	Students were not prepared for the online environment due to some issues at their places (TE-11)
	Students are less interested in online classes; they are struggling too much to cope with the processes (TE-02)
	Students do not find the motivation to enjoy (TE-03)
Shift toward digitalization	It was a sudden shift to a digital environment for all of us, which made us feel alienated (TE-09)
	COVID-19 harmed our lives and teaching system and we were not ready for digitalization (TE-10)
	By nature, we are human and we are not even ready to take alternatives in even the COVID-19 situation (TE-05)
	We were not ready because of the sudden shift and flaws of this system of online teaching (TE-06)

Challenges, Issues, and Problems of Virtual Classes During COVID-19

Challenges and issues in virtual class during the pandemic of COVID-19 was the key theme where 100% of the TEs participated and faced connectivity issues and were not having a proper learning environment (**Table 3**). Some TEs and learners did not have proper Wi-Fi and 3G connection to attend their online classes. They moved from their small villages to towns and cities and joined hostels where they could get a good internet connection even during the lockdown periods. Some of them belonged to remote areas where they did not have proper electricity connection, which was mentioned by TEs as classroom management issues while teaching online classes as connectivity to the Wi-Fi caused linking and off-line problems.

TABLE 3 | Challenges, issues, and problems of virtual classes during COVID-19.

Items	Statements
Connectivity	Connectivity was the key issue in the online system (TE-04)
	Students do not have WI-FI, 3G, and 4G at their places, so they were unable to get their internet connection with the online learning system (TE-07)
	Due to the electricity students disconnected (TE-01)
	Internet connectivity was the major issue that has remained unresolved till the end of the first wave of COVID-19 (TE-09)
Students challenges	Students that are in remote area areas and localities indicated that internet access was one of the major issues for them (TE-03)
	Students have issues like: I thought maybe the open space will allow better internet connection, and noise levels interfering with internet connection were: is there a lot of wind there, or maybe birds chirping, any kind of interference influencing internet connection (TE-08)
	Students whose basic education level is strong can cover anything. There are however also weak students; they are slow learners and they can face learning or comprehension issues (TE-11)
	No gadgets were needed, proper preparation was done and management of issues was achievable (TE-05)
	We could identify students who are residing in rural areas or who are introverted as those students used to speak less in online classes and were slow learners (TE-02)
Learning environment for online teaching/learning	Students attend online lectures while doing work in villages and the learning environment is challenging (TE-06)
	I have moved from my home toward the town hostel where light and Wi-Fi were available (TE-01)
	The place where we are residing is situated close to workplaces which create a lot of noise due to the use of machinery or other equipment used to fulfill tasks. So that disturbs me (TE-08)
	In online systems students were cut off from their family; it means they have been isolated in a room so their life due to COVID-19 and their social and communication skills are destroyed (TE-04)
	I live in a hostel in the center of town during the first pandemic of COVID-19 (TE-10)
Challenges faced by teachers	Teachers are from different social sciences backgrounds, like Sindhi teachers, Pakistan studies, Urdu teachers, so they were not exposed to this kind of teaching, but this is what I am willing to admit as this has nothing to do with me although it involves the teaching they presented (TE-03)
	It was quite challenging for me to deal with ICTs issues, which were resolved with the help of my colleagues, friends and IT department officials (TE-11)
	Classroom management is the biggest issue for faculty members just because of the digital shift (TE-09)
	Somehow in terms of technical issues and digital content development, teachers had challenges (TE-07)

Teaching Instructions, Software Applications, and Platforms Used for Online Classes

Table 4 provides complete detail about teaching instructions, software applications, and platforms through direct statements of TEs about online classes during COVID-19. About 63% of the TEs talked about the teaching methods and techniques during online classes, which were used by the majority of TEs as a student-centered approach. TEs involve their students in blended mode and discussion to engage them in the discussion forum

TABLE 4 | Teaching instructions, software applications, and platforms used for online classes.

Items	Statements
Teaching methods and techniques	Most of the teachers use blended techniques in online classes (TE-09)
	We are using a blended learning approach in which I'm using different kinds of videos and applications and different pedagogical approaches (TE-02)
	The student-centered approach was dominant in my online class (TE-11).
	The flip classroom was in practice in online classes (TE-05)
	I practice collaborative learning in my online teaching (TE-10)
	Online classes based on interactions; means interactive sort of classes (TE-01)
	I usually deliver my lecture with the lecture method (TE-06)
Platforms for online classes	Google Drive is one of the platforms that I usually used during online teaching (TE-07)
	When some students do not have internet and data then they contact me via Cellphone/telephone. So, I used cellphone/telephone calling as well (TE-09)
	I used emails to send material and documents to my students during online classes (TE-03)
Apps for online classes	As it was recommended by the university to use the Learning Management System App during online classes, I made use of LMS (TE-10)
	I was more comfortable with Zoom App for conducting online classes (TE-01)
	Most of the students have connectivity issues, although they have WhatsApp packages. So, I also send material to a founded WhatsApp group (TE-04)
	Some students text me via "Mobile texts" and I respond to them properly (TE-05)
	I use Google meet App to teach my students during the COVID-19, period (TE-08).
	Google classroom Apps were also dominant in my online classes (TE-02)

and collaborative works. However, some teachers were found to use the lectures or traditional methods in their online classes.

The software applications and platforms used for online classes are mentioned as important by TEs. About 81% of the TEs responded that the Learning Management System (LMS) and Zoom App were the dominant apps for conducting online classes during the period of COVID-19. They used the WhatsApp application for the ease of their students in the educational settings of their organizations. Some TEs used SMS service to communicate properly and clearly to maintain the quality of the instructions for their students who had connectivity and internet issues.

Coping Strategies to Solve the Issues and Problems of Online Class During COVID-19 and Preparation for Coming Waves

Table 5 provides complete detail about coping strategies to solve the issues and problems through direct statements of TEs about online classes during COVID-19. About 100% of the TEs discussed coping strategies to solve the issues and problems of online classes during COVID-19. The TEs remained flexible to conduct online classes and show their availability to students during online teaching. The TEs overcame the issues of connectivity and electricity *via* recording the whole class and sending it to students so they could listen when they had a good internet connection. The TEs were available 24/7 to their students because they perceived that students suffer a lot from COVID-19 and online teaching. In the table below are the subsequent statements of the TEs who revealed their coping strategies.

Most of the TEs have experience with online classes in the first wave of COVID-19 and all of them are prepared for the second wave of COVID-19 regarding online education. About 63% of the TEs show their readiness for the second wave of online classes and they prepared themselves with a much better teaching style. About 10% of the TEs were not prepared for digitalization yet because they lacked ICT literacy, which is a prerequisite for the preparation of online classes through multi-methods in digitalization. After all, learners possess various levels of intelligence.

TABLE 5 | Coping strategies to solve the issues and problems of online classes.

Items	Statements
Teaching methods and techniques	I am very flexible in online classes while giving assignments to my students (TE-01)
	I asked them to choose flexible time for online classes when they have electricity and proper Wi-Fi (TE-10)
	Before attending class, technological issues are settled. If it's not working then we record the lecture (TE-05)
	I suggested to them that it's a very important file. So, when you get a good internet connection or modem then you have to download the files. So, that you don't get disturbed (TE-07)
	I also share material on WhatsApp groups. I think most of the students have free packages of WhatsApp. So that's easier for them in terms of going to synchronous mode (TE-03)
	We augmented our time frames and didn't enforce classes at a certain time frame to accommodate all students. If students are comfortable at 10, 11, 12, we moved the class to suit the students' needs (TE-09)
	Connectivity issues were dealt with as we had the alternative to recorded lectures (TE-02)
	Teachers also need to realize that currently in this situation, we have to also think about students, so we must be flexible in assessment as well (TE-11)
Online Availability of Teachers	In online classes I also learn that you cannot be there physically, therefore teachers have to upload all the study material as well as give clear instructions, deadlines and all aspects relating to assignments (TE-08)
	I always respond to their queries on time because I know that students are under too much stress. After all, they are supposed to complete all the assignments from different subjects at the same time (TE-04)
	For students, it is easier to approach teaching than for an employee from a certain institution to approach a teaching process at the kind of work he does (TE-06).
	I try to be empathetic with students (TE-10)
	I also learned that teachers should be available all the time for students, not just in physical classes but also in online classes as well (TE-01)
	I tried my level best to facilitate the students as much as I could (TE-07)
Preparation for coming waves of COVID-19	I get to experience from the first wave and now I am much prepared for the second wave (TE-11)
	The first wave of COVID-19 had challenges to teachers and students but this wave is much better as the situation is also much better for students (TE-04)
	Now, we have got the experience of downloading this Zoom app and using ICTs accordingly (TE-01)
	I am not much prepared for the second wave because still, I am struggling during online teaching (TE-06)
Suggestions for learning during coming waves of COVID-19	There should be training for the online teaching and learning process (TE-03)
	In the second wave, there should be online gamification or some form of recreation or relaxation because students get bored while taking two hours learning sessions (TE-10)
	Not all students are auditory or visual. So, there should be some techniques or methods that give opportunity and a place to everyone where they can learn in a better way (TE-09)

Students' Engagement and Assessment in Online Classes

About 100% of the TEs shared their experience about the engagement and assessment of students in online classes where they share their perceptions about online assessment (**Table 6**). However, they perceive online assessment as the most difficult part of digitalization. They talked about the assessment of the way they assess students like they promote discussion forums, arrange online seminars, allow them to write mini-research reports, and the like. On the other hand, TEs ensure the engagement of students by asking random questions during online classes as TEs do both formative and summative assessments to ensure the engagement of students.

TABLE 6 | Students' engagement and assessment in online classes during COVID.

Items	Statements
Teacher perception about online assessment	Assessment and engagement are some of the major challenges, which that Teachers as pedagogues are facing all over the world (TE-03)
	Assessment is difficult in online classes (TE-07)
	Teachers also need to work on the assessment practices as well; they have to come up with those assessment approaches, in which they can assess the students (TE-05)
	Assessment is one of the challenges for us, especially in the particular COVID-19 pandemic situation (TE-11)
	Assessment of assignments is a challenge as it should also be linked to the assessment being done during the exams (TE-08)
	Learning of students is not effective in online classes so assessment is also not very successful (TE-02)
	Online assessment pattern is different from physical assessment (TE-04)
Assessment in online classes	We can assess the students through assignments, as home-based assignments can be done and submitted later on. We conduct online quizzes and the items are already structured and set (TE-10)
	I uploaded all the assessment aspects on LMS like the rubric, assignments and due dates (TE-06)
	I even gave proper feedback to students during the class (TE-01)
	I trust students not to be involved with cheating (TE-02)
	I assign questions to them during online teaching and learning (TE-08)
	I prefer close book assignments in online classes (TE-03)
	I struggle to access higher-order thinking skills in online classes (TE-05)
	Proposal writing, online seminar and discussions were dominantly used during the assessment that I have done (TE-11)
	Mini-research reports, the use of quizzes, true/false, short questions, fill in the blanks are all used as part of LMS (TE-09)
	Open book assignments were also used in my online assessment (TE-07)
Ensuring the engagement of student during online teaching	I call out the name of the students to whom I do not receive a response and ask them to please respond to the question. They then respond by writing something in the chatbox, and sometimes even indicate: "Ma'am, yes, I am listening" (TE-01)
	I observe how many times they enter the discussion, how many times they ask a discussion question, they oppose the discussion group or comment on my question or each other's questions (TE-11)
	If any student is not participating, even when I'm asking any question, I keep on telling them to apply their mind to it, and sometimes I ask that kind of question again to see if they understand and when someone else gives a response I would make a follow-up and say: "Okay, so do you agree?" (TE-10)
	I always make sure that everyone is participating in the discussion (TE-02)
	I usually randomly ask questions (TE-06)
	One of the good strategies is to always show your presence in the online forum, so students can realize that you are there and are listening to them with attention (TE-05)

DISCUSSION

The study suggested several findings on online teaching during the COVID-19 time frame. However, nine findings have emerged from the collected data from TEs. These include the following: Perception of TEs about Online Classes (PTEOC), Holistic Development of Teacher Educators in ICT (HDTEICT), Readiness of Prospective Teachers about Online Classes (RPTOC), Challenges and Issues of Virtual Classes during COVID-19 (CIVCC), Teaching Instructions for Online Classes (TIO), Software Applications and Platform used for Online Classes (SAPUOC), Coping Strategies to Solve the Issues and Problems of Online Class during COVID (CSSIP), Readiness for Second Wave of COVID-19 (RSWC), and Students' Engagement and Assessment in Online Classes (SEAOC).

The first finding of this study highlighted the perception of teachers regarding online classes as TEs perceived that virtual classes do not replace physical classes because physical classes are more affected by teaching and learning than virtual classes. The same findings are supported by Astuti and Solikhah (2020) as online classes in the time of COVID-19 are not very effective because students are not familiar with digitalization. Likewise, another study suggested that students are not motivated for online classes because of their sudden shift toward virtualization (Kulal and Nayak, 2020). Additionally, Kalloo et al. (2020) support the thoughts of Astuti that online classes could not replace the social needs of learners and instructors. Likewise, Nambiar (2020) highlighted that there is a significant difference between face-to-face classes and online classes in the time of pandemic situations because students gain less in online classes as compared to physical classes. Moreover, TEs perceive online teaching not as a substitute for physical teaching because in physical classes, teachers can understand the non-verbal language of learners (Uzunboylu and Ozdamli, 2011). However, TEs have tasks and responsibilities that cannot be easily transferred when they have to switch from a face-to-face learning system to an online system with online learning experiences that have never been implemented before (Aliyyah et al., 2020).

The second finding of the study revealed that Holistic development in ICT is needed for the twenty-first century. ICT has become a part of our daily lives (Olowe and Kutelu, 2014). To get full benefits of ICT in learning for education, pre-service and in-service teachers must have the basic ICT skills and qualifications (Collis and Jung, 2003). In the time of the COVID-19 scenario, educators require more ICT skills to communicate virtually with learners. The study pointed out that some TEs themselves were inexperienced in the use of ICT during online teaching; they were lacking to record the session and they were unable to use multiple screens at a time (Rahiem, 2020). This study exposed that TEs were not ready for the sudden shift toward online classes, which is supported by Anwar et al. (2020) that learners were not ready to accept the sudden shift toward digitalization because they did not have enough resources and skills. Initially, the students and teachers were not found fully ready for online teaching (Cutri and Mena, 2020) but after training and availability of resources, they started to work. In contrast to this finding, developed countries were much more ready for online classes because they have enough

gadgets and resources to shift their classes toward digitalization (Zawacki-Richter, 2020).

It was also found that students and teachers both were facing challenges during online classes such as connectivity issues. Students were not much familiar with digitalization and they did not have a proper learning/teaching environment. Similarly, Anwar et al. (2020) highlighted that students and teachers living in remote areas were facing difficulties due to slow internet and connection problems, and people in towns also found it challenging. Moreover, Bayern (2020) reported that more than 40% of the respondents said that there were connectivity problems during COVID-19 and it had a negative impact on their life and their family member's education. The results tell some common problems that learners have encountered including loss of internet or data during an online class, inability to load content, and bad audio or video during class due to slow internet. Even some of the students did not have internet access in their homes. Many times, students had to travel a few kilometers away to some other areas to get proper and strong signals to attend their classes and submit their assignments online. This study further reveals that TEs use a student-centered approach, even in online classes, involving students in discussion forums, presentations, seminars, and group work. Likewise, the literature supports that teachers use multiple methods to conduct online classes for the betterment of learners (Babinčáková and Bernard, 2020). Some other studies present this concept in another direction that online teaching is problematic and teachers cannot create more advanced teaching strategies using the online system (Anyiendah, 2017). The finding of another study suggested that educators use different online tools for teaching, including synchronous, LMS, Zoom, WhatsApp, Google app, and asynchronous activities (Lima et al., 2020).

Teachers cope with the challenges of online teaching by making themselves available to learners and being flexible to assist them, which is supported by the fact that teachers' flexibility with time frames during online classes is much more effective because it increases the level of achievement among students (Mahmood, 2020). It was mentioned that a flexible teaching approach is essential for learning as it is important not only for students but also for teachers' professionalism (Netcom 92, 2021). In support of these ideas, Leila et al. (2021) shared her view that teachers' flexibility in the teaching process leads them to believe in the inner capabilities of learners and give them space and time to show their innovation. Additionally, the flexibility of teachers is an advantage for learners to reduce academic pressure. During online teaching, teachers were available to their students to help them in learning and for cognitive support, because some of the causal effects of COVID-19 led to connectivity issues due to a lack of internet and failure to have contact with the students for 24 h a day throughout the week (Shah, 2021).

Assessment is one of the key issues in online classes, and an aspect supported by Zulaiha et al. (2020) as they noted that assessment is the core challenge in the online teaching and learning process. Similar to this, another study indicated that assessment in e-learning is much more difficult because educators are only testing the knowledge of students (Elzainy et al., 2020). As the present study mentions that the formative assessment done during the class shows that formative assessments reflect the nature of online learning and keep students responsible for their studies. This is because the online assessments help learners to demonstrate their ability to think, analyze, and do problem-solving, which is a key benefit of the change from traditional teaching and learning with primarily teacher facilitation (Alsadoon, 2017).

IMPLICATIONS OF THE STUDY

- This study contributes to exploring the significant challenges faced by university teachers to implement e-learning during the time of the COVID-19 pandemic.
- It also explores the influencing factors of e-learning implementation used during the time of the COVID-19 pandemic.
- It is also exploring the coping strategies of university teachers to meet the challenges of e-learning implementation in Pakistan during the pandemic of COVID-19.
- This study gives the roadmap for teachers to teach differently in hard areas while learning digitally.
- It can be seen as a guide to improving the implementation of the e-learning systems among teachers and students.
- The best practices of teachers and management will be a lesson for others.

CONCLUSION

This study contributes to the significant challenges and influencing factors for e-learning used during the time of the COVID-19 pandemic. Such usage and process cover the challenges of digitalization that were not examined previously. The results of this research are based on empirical evidence, which identifies the challenges of online classes faced by university teachers. However, the university, policymakers, designers, and producers of the universities can benefit from the findings, which provide a true picture of the current learning system in the times of COVID-19. It can be seen as a guide to improving the implementation of e-learning systems among teachers.

A total of nine themes were found to analyze the current situation of online classes in Pakistan, which suggested that online assessment was the main issue. Most of the teachers use a student-centered approach during the pandemic. However, teachers were facing the challenges of ICT literacy, classroom management, and connectivity during the shift toward digitalization. Therefore, it is a suggestion for the university management to arrange training programs for TEs so that they can run online classes smoothly.

LIMITATIONS AND FUTURE DIRECTION OF THE STUDY

The study is limited to qualitative research methods, whose results cannot be generalized. Therefore, it is suggested to future researchers conduct the same study with quantitative methods for generalization. The data for the study were collected from a few universities, which can be further enhanced through future researchers to collect data from more universities, that is, public and may be private.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Committee of the Department of Education, SIBAU, Sukkur, Sindh, Pakistan. Patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

ZS did the introduction, literature review, result writing, and final version setting. SS did the literature review and data collection. A-MP did the instrumentation development and discussion. All authors contributed to the article and approved the submitted version.

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