COVID-19, Distance Learning, and the Digital Divide: A Comparative Study of Higher Education Institutions in the US and Pakistan

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ABSTRACT: This comparative case study describes the experiences of students, faculty, and administrators with distance learning during the pandemic in a Midwestern university in the US and a private university in Pakistan. This comparison illustrates how the pandemic differently impacted higher education in two extreme contexts. Findings of this study revealed a far greater digital divide in Pakistan than in the US. Overall, the study reveals the inequality in opportunities and facilities between developed and developing countries and urges the governments, policy makers, and educators to invest more resources in educational technology for making education more accessible and equitable for everyone.

KEYWORDS: Higher education, distance learning, COVID-19, digital divide, student engagement

In the Spring of 2020, there was a worldwide closure of schools and businesses due to the COVID-19 pandemic (Atchoarena, 2020). Higher education agencies in the US, for example, took considerable steps to control the spread of the pandemic by going for a complete lockdown in March 2020, but faculty and students were able to continue teaching and learning by shifting to online learning. Schools and universities provided training to faculty and staff in a short amount of time. The transition was abrupt so students and teachers faced tremendous challenges in schools.

Meanwhile, the researcher studied in a higher education institution in the US at the onset of the pandemic. The challenges that students and teachers faced during the pandemic in the US made the researcher wonder what the situation must have been like in Pakistan, the researcher's home country, where

educational technology had not been the focus of the government prior to the pandemic and the institutions lacked the required expertise and infrastructure for effective online teaching and learning. Even in elitist institutions, there was minimal integration of technology prior to the pandemic (Zahra-Malik, 2020). The government of Pakistan did declare a lockdown and proposed online and distance learning. However, online teaching and education could not be uniformly applied in Pakistan due to the economic inequality, lack of access to technology among the students, and lack of required facilities and infrastructure in institutions of higher education (Ahmed, 2020).

With this global educational crisis in mind, it became imperative for the researcher to understand how higher education was affected by the pandemic and the existing digital divide (Corlatean, 2020; Rimers & Scheicher, 2020; Sarfaraz & Abidin, 2020; Tretler, 2020). While many studies have focused on the K-12 context (Atchoarena, 2020; Blundell et al., 2020; Corlatean, 2020; Sahu, 2020), few studies are focused on COVID-19 and higher education (Karalis, 2020; Mineo, 2020; Soland et al., 2020). Still fewer studies have investigated the effects of COVID-19 on poor developing countries where students do not have equal access to education and resources like the Internet and technology (Bektursynova & Sarsengaliyeva, 2020; Cao, et al., 2020; Chang, & Yano, 2020; Dawadi et al., 2020).

Drawn from a larger study, this paper brings to light the lived experiences of teachers and students with distance learning during the pandemic and addresses concerns about the quality of learning and teaching, educational inequalities, and lack of teacher and student preparation in two different contexts of higher education institutions in the US and Pakistan. This study shows how the comparison between the US and Pakistan draws attention to the fact that if the US, holding the first position in the Global Connectivity Index (2020), faced challenges while transitioning to online teaching and learning, what would be the plight of poor countries like Pakistan, ranking 75th in the Global Connectivity Index (2020)? The researcher hopes that an in-depth analysis of the US response to the educational crisis may serve as an example for other countries like Pakistan. Furthermore, an understanding of the lived experiences of the transition to online learning in higher education in both these contexts may guide educators and educational leaders to come up with better policies and strategies for improving online and distance education and making education accessible to most people.

Before discussing the challenges faced by faculty and learners in the two selected contexts, it is important to explain what distance learning is, how it works, and why it was chosen as the only mode for teaching and learning in the pandemic. It is also important to give the readers a glimpse into the extent of the existing digital divide in the two contexts before discussing how it made online teaching and learning harder during the pandemic. The next section talks about these concepts at length.

Distance Learning and the Digital Divide

The worldwide school closures in March 2020, forced around 1.5 billion learners across the globe to stay at home (Atchoarena, 2020; Chang & Yano, 2020; Sahlberg, 2020; Soland et al., 2020) and posed unprecedented challenges for instructors and students (Karalis, 2020; Mineo, 2020). As the pandemic continued to spread, the need to continue teaching and learning during the pandemic was also highlighted (Chang & Yano, 2020; Diop & Jain, 2020; Rimers & Scheicher, 2020). Consequently, governments and educators devised alternative plans for teaching and assessment methods (Corlatean, 2020) and the most obvious mode to resort to was distance learning.

The term "distance learning" is often used synonymously with online learning, e-learning, distance education, corresponded education, external studies, flexible learning, and massive open online courses (MOOCs). The common features of any form of distance learning are teacher-learner separation by space or time, or both, and the use of technology for communication and exchange during the learning process. Distance education could use correspondence through print-based learning materials or massive broadcasting though TV and radio programs, or through social media platforms. Distance learning calls for highly motivated and autonomous learners that have the required study skills. Not all the students may be ready for this kind of learning. Moreover, proper planning and preparation are needed for implementing distance learning (UNESCO, 2020a). Generally, these plans need to focus on how the current curricula and learning experiences can be shifted to online and distance learning in the best way possible.

While this was the first option that most Western and developed countries like the United States thought of, it was not without challenges. Even in developed nations, such as the Unites States, the use of new technologies and sudden transition to online teaching and learning in a short time were difficult. Faculty were not trained to deliver quality education at a distance (Chenoweth, 2020; Hollweck & Doucet, 2020); some of these technological resources were not accessible to all students; some students living in less developed regions or states did not have access to the Internet or the required bandwidth; digital content for non-formal education and adult learning was limited; and there was a lack of required digital skills in adult learners (Corlatean, 2020; Rimers & Scheicher, 2020; Williamson et al., 2020). Moreover, the distance mode of learning was not suitable for certain practical fields of study (Mailizar et al., 2020). The increased reliance on online learning has had a negative impact on children's education (Blundell, et al. 2020; Poletti, 2020; Soland et al., 2020), but the impact on higher education is no less.

Not only the students but the faculty were under stress over the abrupt transition to online learning. The pandemic disrupted the learning at the final year or final stages of many college and university students (Karalis, 2020; Mineo, 2020; Soland et al., 2020). To continue teaching and learning, online learning was the answer, but the quality of those online learning experiences was often ignored.

Basilaia and Kvavdze (2020), in a quantitative case study at a private school in Georgia in the United States, found that the transition to an online form of education was successful but this quantitative case study failed to address the quality of the online learning experience in that school. Statistical data can give an overall perspective on the situation but fails to provide an in-depth understanding of lived experiences of the people involved. The shift to online teaching was so abrupt that a smooth transition may not have been possible for most institutions. A qualitative study, such as this, can bring to light the lived experiences of teachers and students through the pandemic and address concerns about the quality of learning and curriculum delivery.

Despite the challenges, the pandemic resulted in accelerated student learning and teacher training in using technology through institutional platforms, new collaborations and partnerships, and development of new technologies and teaching methods in the United States and the world over (Corlatean, 2020; Ferdig et al., 2020; Williamson et al., 2020). The negative impact on education has included an increase in inequities, socio-economic disparities, racial and gender discrimination, mental stress among students, and the lack of teacher preparation in the context of the United States and also in other parts of the world (Corlatean, 2020; Williamson et al., 2020). Improving online and distance education can help address some of these challenges by making education accessible to most people, increasing access, equity, quality, and relevance (Ferdig et al., 2020).

To address the impact of the pandemic, many countries in the world, including the United States, took extraordinary steps like scaling up or setting up distance learning platforms including education through traditional media, such as TV and radio; re-designing or rescheduling exams; and providing additional training and technical support to teachers, parents, and families (Tretler, 2020; UNESCO, 2020b). Sarfaraz and Abidin (2020) talked about the context of Pakistan in their blog post in August 2020. They discussed the Advancing Action for Adolescent Girls project (A3G program) which provides a form of accelerated learning to girls in rural areas of the country. Due to the pandemic, the key content of this syllabus was digitized. Ahmed (2020) also points out the challenges that students and teachers had to face in the wake of the pandemic because of the existing digital divide in Pakistan. The schools were closed mid-March 2020 to contain the spread of the virus and the government issued Pakistan's national response and resilience plan to ensure smooth reopening of schools, but the government failed to provide the needed funding and support to the educational institutions.

The Higher Education Commission (HEC) in Pakistan ordered the schools and universities to quickly develop platforms for online learning. The drastic increase in online learning not only exposed the flaws in the infrastructure but also created new challenges. Pakistan ranks 75th on the Global Connectivity Index (2020), compared to the United States which ranks on the first position. In Pakistan's population of over 227,000,000, only 76,380,000 Internet users were reported as of January 2020, which is about 34% of the population. As reported by Ahmed (2020), 37% of people belonging to the age group of 15-65 years know

about the Internet, 17% of the population use it, and 14% are reported to be on social media. If one looks at the gender-based use of the Internet, then only 21% of males and 12% of females are online in Pakistan. Provinces like Baluchistan, GB, and Khyber Pakhtunkhwa have poor connectivity. Access, relevance, and security are major issues associated with Internet use in Pakistan, making online and distance learning extremely challenging (Ahmed, 2020). A YouTube video *Conversations on Pakistan's Response to Crisis* covered the technical challenges faced by some of the elite universities in Pakistan. A point of concern is that, if this is the condition of elite universities, what would be the plight of public colleges and universities that lack funding and proper infrastructure? The digital divide that already existed became glaringly obvious during this pandemic as online learning became the primary mode of education (Hollweck & Doucet, 2020). A major reason for these difficulties with online learning is that education technology had not been a priority with Pakistan's government previously but now the Ministry of Education seems to be acknowledging its role in education as the way forward in the country (Zahra-Malik, 2020). But, Pakistan has closed schools three times at least after the first lockdown due to rising cases of the COVID-19 virus.

Compared to Pakistan, 87% of people in the United States have access to the Internet, 70% are on social media, and in January 2020, 288,100,000 Internet users were reported in the United States (Kemp, 2020). The mobile connections in the United States equal to 107% of the total population. Despite the digital divide that exists in the United States, these numbers are strikingly higher than those in Pakistan. This data gives a picture of the digital divide that exists within these countries but also the divide between developed and developing countries.

Method

This is a comparative case study as the purpose was to find how the pandemic has impacted higher education in two universities, one in the US and one in Pakistan. This was the most suitable method of investigation that allowed the researcher to point out the similarities and differences in the two contexts (Goodrick, 2014). Participants were recruited through convenience sampling and reverse snowball sampling strategies. Reverse snowball sampling means that the recruited participants shared the information about the study and the researcher's contact information with other potential individuals that could be recruited in the study; these individuals could contact the researcher with a signed informed consent and further questions if they were interested in participating. Participants of this study comprised administrators, faculty, and students older than 18 years of age who worked or studied in the selected university contexts. The sample for this study consisted of five participants from the Midwestern US university and two from the Lahore, Pakistan university (see Table 1). The researcher could only recruit two people from Pakistan due to very limited digital access of the participants and time constraints; yet, their data shed light on concerns experienced by students, teachers, and administrators regarding the status of

digital connectivity in Pakistan. Following are brief descriptions of two academic institutions involved in the study.

Table 1

Demographics of Research Participants

Position	Pseudonym	Country
Student	Lisa	USA
Student	Dawood	Pakistan
Administrator (Associate Dean)	Dr. Sam	USA
Administrator (Dept. Chair)	Dr. Simons	USA
Faculty	Angelina	USA
Faculty	Dan	USA
Faculty	Farhan	Pakistan

Case 1 – US University

The first case under study was a Midwestern university in the United States enrolling around 22,000 students from diverse backgrounds. This campus welcomes students and faculty from other countries through employment, student exchange, and study abroad programs. The university uses Tier 1 network services for Internet and has information and technology departments for technology support, services, media services, etc. The university also offers several online master's programs in various fields of study, such as education, psychology, business, journalism, information and communication, nursing, public relations, media design and development, among others. When the university reopened in the Fall of 2020, students, faculty, and staff were required to sign a certification of some sort to make sure that they did not carry the virus. It was mandatory to wear a mask and the university took measures for social distancing, including splitting the classes if large classrooms were not available.

Case 2 – Pakistan University

The second case in this study was a private university in Lahore, Pakistan. The institution was granted university status by the government in early 2000s.

The university began a four-year baccalaureate (honors) program in accordance with world-class standards for accreditation. It enrolls around 8,000 students, has a large number of full-time faculty members, and nearly half of them have a PhD. The university has expanded its programs of study and offers more than twenty majors in both the baccalaureate and postgraduate levels. It also has a department of computer and management sciences, research labs, and facilities. The university uses Moodle as the learning management system. No information is available regarding online programs of study offered by this institution. When the schools reopened during the pandemic, it was mandatory to wear a mask. Students, faculty, and staff were required to sign a heath affidavit to make sure that they did not carry the virus. Social distancing was imposed and classes with large numbers of students were split in half to allow for social distancing.

Procedures and Instruments

A recruitment email was sent to the faculty, students, and administrators at both the institutions. The researcher contacted the administrators, faculty, and students she worked with in the previous years in both Pakistani and American universities. Participants were asked to forward the author's email address and study information to other potential participants for contact purposes. Those willing to participate provided informed consent and were scheduled for a Zoom interview. Once participants signed the consent form and scheduled a Zoom interview, they were interviewed using a set of open-ended questions at the scheduled day and time. A separate interview protocol was designed for the teachers, the administrators, and the students. The interviews were audio recorded with the permission of participants. The interview consisted of 10 questions and a few sub questions and probes. Participants were asked about their background, the impact of COVID-19 on their learning and teaching practices, and their thoughts about the resulting policy changes. All interviews took place in the Fall of 2020 and each interview lasted for 30 minutes to an hour.

Although this was an IRB-approved study that yielded some very interesting findings, it did not have sufficient number of participants from Pakistan. The participants from Pakistan did not respond to emails and failed to schedule interviews. People in Pakistan are more easily reached through phone calls and in-person interaction. Another limitation is that this study could not supplement the interviews with some sort of surveys and observations for the purpose of triangulation. The current pandemic did not provide suitable opportunities and the environment for observable data to be included in the study.

Findings

Since this paper is part of a larger study, only the findings related to technology use and the digital divide are discussed here.

Case 1- US University

The data laid out below came from five participants representing three groups: faculty, administrators, and students. The major themes drawn from the interviews were the lack of faculty preparation, learning new technology, and students' experiences with technology.

Lack of Faculty Preparation

Despite having many online programs in the university, some department leaders found that their faculty were not prepared for online teaching. **"**So, the first biggest challenge was going to the online environment... in our college, at least 40% of the faculty members were not prepared for that" (Dr. Sam, personal communication, October 17, 2020). The administration had to prepare the faculty through offering them different forms of workshops and professional development opportunities to be able to make this transition. Many teachers, despite being exposed to online teaching, found this transition very challenging. When asked about the transition, faculty used the terms "chaos" and "mess" for the experience because, **"**everything – assessments had to be online, everything. Everything had to be switched... quickly and not very, not very well done" (Dan, personal communication, October 28, 2020). Despite having prior exposure to online teaching, some faculty did not prefer teaching online and liked the on-campus experience better, so it was harder for them to adapt. As Dan said, "So, I have a kind of a, not a positive attitude to towards the change. I don't think it's the same thing. I'm not one of those who would say 'yeah, online teaching is the same,' no its not."

Online teaching may not be the best mode of teaching for every faculty; some faculty do prefer to teach in a face-to-face mode for greater student involvement and interaction. The most suitable form of distance learning in the pandemic was often the online asynchronous method which does not allow for teacher-student and student-student interaction as would happen in the on-campus classroom. While the transition to online teaching was hard for the teachers, it appeared harder for the non-teaching staff and faculty in some of the practical fields who were not used to the online mode of delivery. As explained by Dr. Simons, "It was far more difficult call for them to suddenly stop what was their norm and then go to an online delivery of their content, which may or may never have been organized for delivery to remote students."

Learning New Technology

The pandemic contributed towards a greater reliance on technology for teaching. As Dan explained,

> Yeah. So, since the pandemic, everything switched online for me, so I had to learn to use a lot more technology to deliver the courses online. So mostly, becoming familiar with Zoom. Becoming familiar with WebEx, becoming familiar with other apps that allow you to deliver the material and have a conversation with students. Ways to record the lecture too, I wasn't familiar with them. So, I had to become familiar with Zoom, you can record your lecture, but I'm thinking even, you know, PowerPoint narrated slides and stuff like that. So, it has increased a lot more. Yes. It was not easy, right. Many things require time… it was quite a learning curve.

The pandemic forced many faculty members to teach online and learn new kinds of methods and applications which made their online teaching more effective.

Administrators realized that the transition to online teaching and learning did not stop the learning process but it was not without problems. When students were sent home in the Spring of 2020, the faculty and administration did not foresee a new set of challenges that were related to the access of technology and Internet connectivity.

> In Spring, when we left campus, most of us faculty forgot that students were going home to marginal Internet service... They were using little laptops that were way too old and slow and cumbersome. So, from a technology standpoint we were trying to act like they were still at campus with the best quality in the world and T1 line. In reality, they weren't. Okay. And I also noticed that I tried to run my class at 1 o'clock every Monday, Wednesday, and Friday. They were on different time zones. Some live in Illinois or some other places; they went home to different time zones. Once they were home, they needed a job or something to make ends meet so they may have scheduled a job at 1 o'clock Monday, Wednesday, and Friday because they weren't sitting in my classroom. So, a lot of social factors as well as technology, but the biggest one is most folks don't have the resources that are common of a college campus with very, very good signal quality. (Dr. Simons, personal communication, October 20, 2020)

This error in judgement about the students' access to needed resources was expressed by all the leaders and the faculty who participated in this study. Some student participants also complained that the faculty were not understanding of their challenges and did not reduce the workload or the number of assignments, etc. The expectations of the faculty remained the same for the students who were dealing with various kinds of challenges.

Internet connectivity was not only a problem for the students but also for the faculty when they were required to work from home. Many faculty members felt that they did not have access to good quality Internet at home and it was a challenge for their students, too, as Angelina explained,

> Granted, we have wifi at home, but I was on it constantly. So, if my mom who was staying with us... was streaming... my son... was streaming... Yeah, the wifi was a problem for me, that's what I had to tell them sometimes.

If the faculty had to deal with the connectivity issues, it was important to keep in mind that the students were in the same situation. Perhaps it was harder for the students as they had to meet the expectations of so many teachers at the same time. "We take for granted that our students can have immediate access to a computer and Internet, fast Internet, not just Internet, and it's not true," said Dan. "Many people cannot afford that. And, so I think the university should keep that in mind" (Dan, personal communication, October 28, 2020).

Connectivity was an issue but so was affordability. Not many students were able to afford a good Internet connection. College students mostly paid for their education through either graduate assistantships, student loans, or doing odd jobs like working at a restaurant. The pandemic made it hard for students to work outside of campus to support their education expenses. In light of these circumstances, Dan added that the faculty should keep that in mind and give a margin to the students as things often tend to go wrong with technology and then take time to fix. Another faculty participant, Angelina, acknowledged that the problem of the digital divide and connectivity was very real, and it was a problem in higher education as much as in K-12.

> I think we completely misjudged, as a university, what the students had access to when they were going back home. And because I cannot tell you how many students in just in my class didn't have access to reliable Internet, or may not have access to the Internet, or they were sharing their technology or computers with their siblings, who were also now home... I pretty much made my due dates fluid, because I didn't know what these students were going back to. And I think that was the biggest misjudgment we made, as a university... And this just isn't K-12. I mean, anybody that I talk to who asks me in higher ed, I am telling them, this is our issue, too.

Angelina clearly explains how the students had to deal with poor connectivity and technology access issues during the pandemic. Even though the faculty were able to offer accommodations to the students who needed extra time, the challenges of access and connectivity made learning harder for the students in these courses. The issue of connectivity continued for the students in Spring, Summer, and Fall of 2020 when most of the courses were offered online and only a few were offered on campus due to lack of large enough classrooms to hold as many students as possible placed far apart. A faculty participant pointed out her concerns that students may not have access to the resources they need at home. In uncertain pandemic times, it was hard to predict what a family might be going through and what kinds of technological resources were available to students at home.

Students' Experiences with Technology

The transition to online teaching generally had a negative impact on student learning. "In my course, the learning stopped at that moment we went to online... It became more robotic than it was organic," said Angelina. Other faculty members

also felt that the transition impacted student learning but thought that it did not stop the student learning entirely. "They're still learning, they still reach the learning objectives. It's just not as easy... It's harder," said Dan. Lack of face-to-face human interaction in online courses made it harder for the students to engage. In addition, practicum courses were strongly affected by the pandemic in terms of the quality of learning experiences that were available for students after the transition to online learning.

Some faculty participants pointed out that they had overestimated the technological proficiency of their students. "Sometimes we just assume that, 'Oh, they'll be able to figure it out...' I think that's an assumption we made. And it's definitely not true" (Angelina, personal communication, October 28, 2020). Just like not all faculty are tech savvy, not all students are good with technology. In such cases where it is necessary to introduce the students to new tools, it would be advisable to demonstrate the use of new technologies in the class or in a video first so that it is easier for the students to follow.

Students were familiar with technology and used technology for their learning previously but, after the pandemic, they found themselves relying solely on technology for learning. This increased reliance on technology was not appealing to many students. As Lisa said,

> I don't particularly like it for a lot of reasons. One being just looking at the screen so long, it can get tiring and gives me headaches... It's hurting my eyes and it's just hard to engage, all day, every day. Even my work is on technology, working from home. So now school is online. It's tough!

No one seemed to have considered the physical impact of the constant use of technology on the students and faculty. Gazing at the computer screen for so long is bad for the eyesight. Some of the other reasons for a negative attitude toward technology use were pointed out as lack of prior exposure, contradictory to their learning style, and lack of physical activity. Another student participant reported facing challenges in their graduate teaching assistantship and in their learning as a student because of bandwidth-related issues and understood how lower income students might not have reliable Internet at home.

Case 2 – Pakistani University

The university campus in Lahore, Pakistan was closed for the first lockdown and re-opened on the 26th of October, 2020 only to close again when a second lockdown was imposed in the country. Based on data analysis, the major technological challenges were lack of preparedness, lack of professionalism, and technology access. At the same time, these challenges led to opportunities to learn and collaborate. All will be discussed below.

Lack of Preparedness and Professionalism

According to Farhan, the faculty members who had studied abroad were familiar with online teaching. They were capable of using the learning management systems and applications like Zoom, Kahoot!, etc. It was not much of a challenge for them but then these faculty were few in number. The majority of teachers "were flabbergasted, they had no clue what to do" and had to start working with technology from scratch... So, they actually had to learn everything I knew, and it was difficult for them" (Farhan, personal communication, November 13, 2020). Consequently, the faculty members at the university in Pakistan needed to be trained to use the learning management system, Moodle; they were also given extensive workshops and training. Students were similarly not prepared for this kind of learning; they did not know what to expect or what was expected of them. Dawood, a student participant from Pakistan, expressed his frustration at not understanding what was expected of him in his online classes, especially when there was not enough teaching of the course content. He struggled in writing his assignments as he did not know what his teachers expected of him.

In the time of an educational emergency, when the teachers should have been extra helpful and more available to the students, around 20% of the faculty were not responding to student emails nor giving them feedback. As Farhan explained,

> If you have given an assignment, you're supposed to return in two weeks' time, and student is asking you, 'What is my grade? What is my grade? You should have this moral courage to tell that I was unable to get your assignment, I will give you feedback in a week's time... but teachers, I'm sorry, they lack professionalism, sometimes. And sometimes they have too many projects that they're working on, and it becomes difficult for them to switch between those projects.

Dawood, the student respondent from Pakistan, also reported difficulty in getting in touch with the faculty, receiving timely feedback, and dealing with faculty members who only gave four days for completion of assignments. This was stressful for many students. The teachers were not just technologically unprepared, they also often lacked a sense of responsibility towards their students and failed to act professionally. Moreover, the above quote points to an important fact that, most of the time, the faculty members were busy with their own agendas and their own research endeavors, which prevented them from being available for their students. While the pandemic was a good time to increase in scholarship and publications for the faculty, it should not have come at the cost of unavailability to their students.

Limited Technology Access

Pakistan is a poor country and does not have the same resources available as the United States. The biggest issue with transition to online learning was

whether the students and teachers have the technology that was needed for online learning to take place. Unlike the faculty in the US university, faculty in Pakistan are not given technology and computers to teach. They have to buy their own computers. However, two years ago, the university administration in Pakistan's university made an offer to the faculty members that, if they "wanted to get a new computer, they should get it, and (university) will pay half of the price. So, a lot of faculty members, they went for the new computers" (Farhan, personal communication, November 13, 2020). There were computers available in the library for students to use or borrow if they needed. But during the pandemic, the library was closed. Most students had only a smart phone for watching videos and listening to recorded lectures.

Most homes in Pakistan would only have one refurbished desktop computer, as laptops are very expensive in Pakistan and not many families can afford to have one. Usually, one computer device is shared by the whole family. Farhan reported that some of his students had to share the computer with other siblings at home and so they only had a certain window of time when they could respond to emails, watch lectures, and do their homework. One of his students told him,

> Sir we have only one computer and we share it among siblings for schoolwork, I can only read and respond to your emails at night and do my work in three to four hours when it is my turn to work on the computer. (Farhan, personal communication, November 13, 2020)

If students do not have access to a computer, it is difficult for them to complete their assignments and tasks on time in an e-learning program. This is the situation in most homes in poor countries.

Despite having access to some form of technology, connectivity was a big problem for the students in Pakistan. The Internet connection on campus was much better but the connectivity that the students and teachers had at home was not always reliable or as powerful as was needed. As Farhan explained, "We don't have those proper Internet connections in Pakistan. And sometimes most of us don't use mics or things like that. And our older faculty, they are not very comfortable using technology."

Older teachers were not accustomed to teaching with technology, so they had a hard time; besides, the poor Internet and poor technology affected the voice quality in the recorded lectures. Moreover, Farhan referred to the "poor Internet connection" at his home during the Zoom interview, "even now, I'm unable to turn on my video. If I turn on my video, the voice quality will go down." Going for a powerful Internet connection with good speed and bandwidth means "you have to pay extra" and the connectivity always "varies from location to location" in the city and the country (Farhan, personal communication, November 13, 2020).

Added stressors for both faculty and students during the lockdown and e-learning experience were the power outages. Poor countries like India and Pakistan have frequent power outages which interrupt the daily lives of the people. Pakistan has had power outages for a very long time. Power outages are more

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frequent during the long summer months, as more electricity is consumed by people and less is produced. The transition to online learning was especially challenging for students in Pakistan when they had to be online for a synchronous class and there was no electricity. Not everyone in Pakistan is able to afford a laptop. Most students have a refurbished desktop which only operates if electricity is available. Poor connectivity, coupled with power outages and lack of resources made online teaching and learning very hard in Pakistan. As Farhan explained,

> They feel frustrated, they feel anxious. And if the length of the moment the connection is, it drops, or it's poor, you start getting WhatsApp messages straightaway. "I've lost my connection," "I'm unable to listen to you." "Could you please repeat things that you said about five minutes ago?" "There is no light (power) in my area... I won't be able to attend today's lecture.'

In the absence of electricity, online learning became a real challenge for the students and teachers alike. In the wake of the pandemic, the teachers struggled to teach in Pakistan and the learners struggled to learn due to poverty, lack of technology, poor connectivity, and power outages.

Other challenges to online learning in Pakistan were culture-related attitudes. In Pakistan, due to lack of technology access, people do not have the culture or the habit of checking emails regularly. They are not aware of email ethics as they are accustomed to in-person or telephonic correspondence and transaction. So, some cultural issues contributed to the lack of professionalism among faculty.

A particular culture-related issue was a reluctance to use videoconferencing and video recordings as women in Pakistan tend to hesitate and shy away from the camera. Some of the female faculty preferred other ways to reach their students instead of Zoom video calls. They used WhatsApp and YouTube to share recorded lectures. Most female students also avoided showing off their face on camera due to religious, cultural, and personal reasons. Some teachers were relaxed regarding their expectations with videoconferencing while the others were not. Farhan reported that many of his female students would turn off their camera during videoconferencing. Some women are more conscious of their physical appearance; they never go out of their house without wearing makeup and, so, would avoid showing their face on camera. "Sir we are not wearing any make-up, so we don't want to turn on the camera" (Farhan, personal communication, November 13, 2020). Women avoid appearing in front of the camera in Pakistani culture due to religious and cultural reasons as well. Religiously, women are encouraged to cover their faces in front of men. Culturally, women are scared of their images being used inappropriately by others. When women turn off their camera during a videoconferencing session it becomes hard for the teacher to determine if they are present and attentive during the video call. This can be distracting for the teacher. Moreover, not being able to identify the person one is talking to makes it difficult for other classmates to engage in discussion during a video call.

Opportunities to Learn and Collaborate

Notwithstanding the challenges, the pandemic also allowed faculty to improve their teaching practice and learn to use new technologies. "40% of teachers, they were a bit aware of this technology. Those 40%, they got better" (Farhan, personal communication, November 13, 2020). Those who were not tech savvy learned and those that had some idea were able to improve themselves further. Farhan explained that,

> It has helped me become a better teacher; it has reduced my work, for example, Kahoot... all that paperwork that actually we were used to, it has gone, and especially the plagiarism thing, when we are able to set our assignments on Turnitin... the assignment reaches us via Turnitin. So, if it is a plagiarized assignment, even if the paragraph has been plagiarized, we are able to catch it straightaway. So, it actually has reduced a lot of my burden.

The use of new applications and technological tools have increased the efficiency of teachers. The pandemic forced everyone to go online and, as a result, they had to rely on Moodle, the learning management system. Using Moodle gave them the opportunity to use plagiarism detection tools like Turnitin, thereby making things easier for the faculty.

Moreover, technological difficulties encouraged the faculty to be a bit creative and devise ways to overcome some of the challenges. Farhan was able to overcome the technological difficulties by creating a small portable studio with light and good sound that helped him to record good quality videos for his students.

> Actually, I have sort of come up with some sort of a studio. It's a moveable studio that I use. If I'm supposed to teach from home, I set that up at home. If I'm on campus and there is no light and the Internet is poor, I can use my mobile phone. And I can use it straight away with the mic attached to it, there is a speaker. So, you can see it's a small, small, portable studio that is moving with me all the time. (Farhan, November 13, 2020)

Farhan had some familiarity with technology and was able to be creative and come up with a way to overcome those technological difficulties and issues. He was also able to assist his colleagues and teach them how to use a smart board, how to upload videos, etc. So, these technology challenges helped create a collaborative environment where the faculty members could learn from each other.

Overall, The pandemic had a huge impact on student learning due to the lack of training and preparation of the faculty. The recorded lectures that the students received were reduced and shortened in length for recording purposes. These were from the faculty members who were not familiar with Zoom and other new technologies. These recorded lectures spanned 10 to 12 minutes only, which was not sufficient instruction time to guide the students (Dawood, personal communication, November 20, 2020; Farhan, personal communication, November 13, 2020). Farhan agreed that learning was "not as meaningful" and it resulted in

student discontent. "When they would text you, they [students] would email you, you can figure out that they were not happy" (Farhan, personal communication, November 13, 2020). The students were not happy with the quality of the online learning experience during the pandemic.

Discussion

This qualitative case study confirmed the challenges associated with technology use in the context of higher education as have been discovered and reported in other studies (Bektursynova & Sarsengaliyeva, 2020; Cao, et al., 2020; Chang, & Yano, 2020; Dawadi et al., 2020). The study revealed that the biggest challenge was the lack of required digital skills in faculty and learners for a smooth transition to online teaching. In the context of higher education, it is easy to assume that everyone should be prepared; however, this study confirmed that most adult learners and practitioners were not prepared for the changes brought about by the COVID-19 pandemic (Rimers & Scheicher, 2020; Corlatean, 2020). The problems with connectivity and accessibility as discussed by other researchers were also confirmed in this study. All the participants agreed that the Internet was not always very reliable. In a crisis like this pandemic, when everyone has to rely on remote jobs, remote education, etc., a fast and reliable Internet is extremely necessary. The absence of a reliable source of Internet poses difficulties in teaching and learning as revealed in the study. However, the institutions were able to offer technical support and professional development opportunities to the faculty and they were able to learn how to work with new technologies (Corlatean, 2020) despite the challenges.

Between the US and Pakistani universities, there were some similarities. First, faculty in both institutions had extensive teaching experience. Some faculty in Pakistan were foreign-qualified as well. In both cases, the faculty and the students were not prepared for the transition to online teaching and learning; however, the faculty at the Midwestern US university had more experience and exposure to online teaching as compared to the faculty in Pakistan. The pandemic resulted in increased reliance on technology for everyone. Applications and tools like Zoom, Google Meet, Google Teams, and WebEx became very popular during the pandemic at both institutions.

Both institutions also required the faculty and students to sign a health affidavit form to confirm that they were well enough to enter the university premises (Dr. Sam, personal communication, October 17, 2020; Farhan, personal communication, November 13, 2020). At the Midwestern university, the graduate assistants were also required to sign a certification of some sort to ensure they did not carry the virus. Both institutions took measures for social distancing, including splitting the classes if large classrooms were not available (Dr. Simons, personal communication, October 20, 2020; Farhan, personal communication, November 13, 2020). People had mixed responses to the schools reopening in both contexts; however, the faculty all agreed that the first lockdown was necessary. Some

challenges for the students in both cases were also similar. Students lost their motivation; they were frustrated and confused. The online learning experience was not as meaningful as on-campus courses. There were challenges for the graduating class because their experience was not what they had expected it to be. In short, the quality of learning was compromised in both settings.

At the same time, there were clear differences. The most obvious difference related to teacher preparedness. At the Midwestern university, 40% of the faculty were not prepared for the transition (Dr. Sam, personal communication, October 17, 2020) while, in the Pakistani university, 70% of the faculty were not prepared to teach online (Farhan, personal communication, November 13, 2020). This estimate implies a lack of technology integration in the teaching practice in Pakistan prior to the pandemic. However, the institution in Pakistan was able to train the faculty to use latest technologies to teach online and the percentage of unprepared faculty was greatly reduced. In addition, the faculty at the Midwestern university were more professional and responsive towards their students, unlike the faculty in Pakistan. In both cases, the faculty were found to be accommodating and understanding. The university in Pakistan also tried to help those students who did not have access to technology by offering them other distance learning opportunities. The coursework, lecture notes, and assignments were mailed to them by post and the students could mail the completed work to the institution, which would then mail it to the concerned faculty.

A wider gap in technology access was noted in the case of Pakistan where students had to share their home computers with siblings and family members. Frequent power outages in Pakistan also posed challenges for the students and faculty in synchronous online classes. Female students and faculty in Pakistan found it difficult to engage in videoconference calls due to religious and cultural reasons. There were no such issues reported by participants from the Midwestern university. As most of the faculty in Pakistan were not very efficient in the use of technology, knowledgeable faculty shared their expertise with colleagues. This gave rise to teamwork and collaboration among the faculty in Pakistan during the pandemic. Such collaboration was not mentioned by the faculty participants at the Midwestern university, as most of the faculty members at that university were proficient in the use of technology. The schools and colleges in Pakistan went for another lockdown in November 2020 due to the rising number of virus cases in the country. Schools closed for a third time in Spring 2021. The impact of the second and third lockdown on education in Pakistan is yet to be evaluated.

Recommendations

One major lesson learned from the COVID-19 pandemic is the need to be prepared for an emergency situation. Readiness is needed not just in terms of having a plan but also the necessary training of the faculty, staff, and students for the execution of the plan. The pandemic revealed a gap in the awareness and use of technology by the students and faculty; they were not prepared for the transition.

Any planning for the future needs to include the technological aspect and the technological readiness of the people involved. Training in technology use should focus on the meaningful and effective use of technology. Teacher preparation programs need to place special emphasis on technology use and aspiring teachers need to be trained in engaging young students in online courses. They need to be trained in the use of new technologies to increase student motivation while striving for quality in online courses. Online courses need to be made more student-centered. Professional development programs for faculty in Pakistan need to focus on training for online teaching and address some of the cultural issues related to technology use. Workshops in online learning can also be beneficial for learners who do not have any prior experience with online learning. These workshops can discuss acceptable student behavior in the online classroom and cover some cultural issues and their solutions. Evaluation and analysis of the existing curricula to determine how fluid and adaptable they are for emergency transition to online teaching and learning should be carefully undertaken. With proper evaluation and curriculum planning, even the practicum courses could be adapted to offer a meaningful learning experience to students in future.

Education should be accessible to everyone. Schools, colleges, and the government should strive for increased equity in education. Investment is needed to find ways for making technology and Internet more accessible for everyone. Resources like e-books, journals, and research could be made more accessible by reducing the cost or releasing them to the general public. Applications like Zoom and WebEx were very helpful to the people in this pandemic and they often made their services available free of cost. More resources need to be accessible to the students and faculty to be able to perform their tasks effectively. Pakistan has suffered from frequent power outages for many years. The Pakistani government and private sector institutions can collaborate to find alternative sources of energy, like solar energy, to combat frequent power outages. Solar panels are expensive, but the government and private institutions can collaborate to meet this need so that at least institutions of higher education can have a constant supply of power. This may lift some load from the government-owned power grids and cut back on frequent power outages. Establishing as additional coal power plant is also an option, though it is not as environment friendly as solar. The United States is blessed that it can offer quality education to those who desire it. The government of Pakistan needs to invest more in the field of educational technology and improve country-wide connectivity. In addition, the government needs to offer low-tech or no-tech solutions to minimize the impact of the digital divide; public-private partnerships and collaborations can help meet the needs of all the learners and educators.

Conclusion

This comparative case study revealed the digital divide between two higher education institutions in the US and Pakistan and the challenges participants faced during the COVID-19 pandemic. Most of the challenges were similar in nature but Pakistan experienced a larger digital deficit. The quality of learning was greatly

compromised in both contexts and the students experienced a loss of motivation to learn, as meaningful classroom interaction often could not be replicated in online courses. The pandemic gave rise to confusion, chaos, and uncertainty among students and faculty. While these issues were present in the American context, they were more prevalent in Pakistan due to lack of teacher preparation, lack of professionalism, lack of access to technology, lack of stable electricity, poor Internet connectivity, and some cultural and religious limitations experienced by female students and faculty.

There are important lessons that both countries can learn from each other. The US is a multicultural nation and professors may have some students who try to avoid videoconferencing due to cultural or religious reasons. Higher education institutions in the US host many international students from poor and developing countries of the world. An understanding of the existing digital divide in poor countries like Pakistan can help American universities understand that these international students may not be ready for the technologically-enriched environment in US institutions. Therefore, measures can be taken to provide extra technology support to international students who come from low-technology backgrounds. Institutions in Pakistan can train their faculty to be more professional in dealing with their students, to be more available for feedback, and to support students, especially in a crisis like this pandemic. Educational institutions in Pakistan need to incorporate learning management systems like Moodle, Canvas, or Blackboard and train their students and faculty in effective distance learning and teaching.

In both contexts where students suffered from loss in motivation in online classes, practitioners should strive to engage their learners in meaningful activities and maximize learner participation in discussion forums. Educators need to be accommodating when students have genuine issues of poor connectivity and lack of access to technology and should provide alternative activities and ways to teach content, allowing multiple options for completing tasks and assignments. The goal should always be to make the learning content as accessible as possible and to provide equitable opportunities for learners to complete tasks. Further research about the quality of learning during the pandemic both in K-12 and in higher education is needed. Future research can focus on improving distance learning for practicum courses in teacher education in the absence of in-person classroom experiences. Research is needed to discover and document activities that are most suitable and helpful in online classes and document some of the successful teaching and learning experiences so that other practitioners can benefit from them.

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