HLRC | HIGHER LEARNING RESEARCH COMMUNICATIONS

Higher Learning Research Communications
2021, Volume 11, Issue 2, Pages 91–110. DOI: 10.18870/hlrc.v11i2.1269

Original Research

WALDEN UNIVERSITY

Remote Teaching in Nepalese Higher Education During COVID-19: Teachers' Perspectives

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Abstract

Objectives: The purpose of the study was to examine the factors that supported or inhibited teacher participation in remote teaching. Teaching and learning in Nepal was predominantly face-to-face prior to the pandemic, and the previous studies showed that the use of educational technology in higher education was limited.

Method: This exploratory case study draws on data derived from focus group discussions with teachers in higher education. Thematic analysis was employed to explore the impacts of different factors in sudden transition to remote teaching.

Findings: Findings show that personal factors such as teachers' sense of duty and their attitude towards technology use facilitated their practice despite technological (internet connection), organizational (directives on exams or online classes) and environmental (inconsistent power supply) issues.

Implication for Theory and/or Practice: Continued uptake of technology by teachers and colleges and universities should be practiced to move education towards a blended approach to teaching and learning. Educational authorities should provide more explicit guidelines on teaching and learning and administration of assessments across multiple situations, including pandemics and other emergencies requiring higher education to pivot.

Conclusion: COVID-19 has sped up technology uptake and integration in higher education in Nepal. It increased awareness of technology and encouraged teachers to enhance their skills to integrate technology into learning.

Keywords: *remote teaching, developing country, ICT in education, COVID-19*

Submitted: July 20, 2021 | Accepted**:** November, 14, 2021 | **Published:** December 6, 2021

Recommended Citation

Laudari, S., Pradhan, S., & Lama, S. (2021). Remote teaching in Nepalese higher education during COVID-19: Teachers' perspectives. *Higher Learning Research Communications, 11*(2), 91–110. DOI: 10.18870/hlrc.v11i2.1269

Introduction

Higher education institutions globally are significantly affected by the recent COVID-19 crisis. With the closure of the educational institutions, most teaching and learning activities were stopped or moved online. While those with sufficient infrastructure and resources pivoted to fully online teaching activities, institutions that were not as prepared did not start teaching immediately. In addition to the challenges related to infrastructure, they also needed to train and support teachers and students when moving online. Likewise, teachers who have long been teaching face-to-face were required to navigate through digital tools and platforms, deliver content, and conduct assessment activities remotely.

As in most parts of the world, educational institutions and teachers in Nepal were also required to teach online as the pandemic caused the closure of most educational institutions. However, previous studies on technology use in higher education have demonstrated that most educational institutions had limited technological infrastructure (Laudari, 2019), and teachers who chose to use technology faced several issues, including internet connectivity, training, and institutional support (Laudari & Maher, 2019). Additionally, it has also been reported that not all teachers had the required skills to teach in a digital space (Nair et al., 2020). Despite these issues and lack of preparedness, teachers were required to pivot to online teaching to continue teaching and learning activities.

This exploratory qualitative case study investigates how teachers pivoted to remote teaching in a higher education institution in Nepal during the COVID-19 crisis and the factors that facilitated or inhibited remote teaching. This study has implications for organizational preparation in facilitating technology integration in teaching activities in higher education. This study is critical because the findings can inform how higher education institutions in developing countries with limited technological resources can support online learning and teaching.

The remainder of the article is organized into five sections. The first section contains a review of the relevant literature and categorizes factors that impact the use of instructional technology in higher education institutions. It is followed by a brief overview of the research methods of this study. Then the findings are presented in four subcategories—personal, technology, organizational and environment. Next, the results are discussed with the help of the relevant literature. Finally, the conclusion, implications, and future directions are discussed in brief.

Factors Impacting Information and Communication Technology (ICT) Use

The use of educational technologies in teaching and learning is affected by a myriad of factors. While some factors facilitate technology integration and use, others hinder use. Scholars have labelled these factors as essential conditions (Becuwe et al., 2017; Hamel et al., 2013), contextual factors (Mishra & Koehler, 2006; Porras-Hernández & Salinas-Amescua, 2013), and barriers (Ertmer 1999). Other researchers (Drent & Meelissen, 2008; Francom, 2016; Kopcha, 2012) group them under different categories, such as resources, training and technological support, institutional policies and processes, and personal factors.

In this research, we are using internal and external factors (Ertmer, 1999) as the main categories to review, group, and summarize the factors discussed in the literature. Internal factors, which are also identified as personal factors (Ertmer et al., 2012), include attitudes, knowledge, and skills of teachers that have been argued to influence their technological practice (Ertmer et al., 2012). External factors are those that are beyond teacher control and are necessary for the effective use of technology. These factors are further divided into categories of technological, organizational, and environmental. These categories—personal, technological, organizational, and environmental—also serve as the analytical framework for this study (Aguti, 2015).

Internal Factors

Internal factors are teacher-related and not necessarily apparent (Ertmer, 2005; Ertmer et al., 2012). These factors can include knowledge and skills required to use technology and pedagogical beliefs, such as beliefs about how students learn (Ertmer & Ottenbreit-Leftwich, 2010). Studies have shown that personal factors such as pedagogical beliefs and technology competencies can influence the use of educational technologies by teachers. For example, Tondeur et al. (2017) reported that teacher beliefs and competencies were found to have influenced technology integration both positively and negatively.

Teacher views about technology use and pedagogical beliefs have been identified as playing a critical role in educational technology use; positive beliefs support technology use and negative beliefs can deter its use in teaching and learning activities (Elatrachi & Oukarfi, 2020; Vasinda et al. 2017). Shah et al. (2020) argued that teachers who used transmissive pedagogy and considered technology as a time-saving mechanism did not use technology to enhance teaching and learning, whereas those who believed that technology use could contribute to collaboration, communication, and knowledge building used technology. Laudari (2019) found that those teachers who believed that technology could support student engagement in teaching and learning used different tools in their practice.

Several studies have also suggested that technology competencies influence educational technology use. For example, in a study of more than 800 teachers, ICT competencies were found to mediate technology use in teaching and learning (Nelson et al., 2019). Vasinda et al. (2017) revealed that the lack of technological knowledge prohibited the innovative use of technology. Shrestha et al. (2021) suggested that teachers faced challenges for conducting online lessons during the COVID pandemic due to their lack of digital skills. Blundell et al. (2016) and Ifinedo et al. (2020) found that ICT knowledge was an important factor in how well teachers integrate technology into their practice. Phelps and Vlachopoulos (2020) also found that teachers' hardware and software skills influence the effectiveness of online teaching practices, and they further argued that "facilitators [teachers] should be at least on par with their learners' digital citizenship awareness and practice" (p. 1522-1523).

External Factors

Factors beyond a teacher's control also influence the use of technology in teaching and learning (Porras-Hernández & Salinas-Amescua, 2013; Reid, 2014; Voogt et al., 2016). A review of relevant studies, including Gaspards-Richards et al. (2020), Blundell et al. (2016), Francom (2016), and Porras-Hernández and Salinas-Amescua (2013), substantiates the influence of external factors on technology use. One commonly discussed external factor is time available for lesson preparation. Time for lesson planning and ICT-related professional learning influenced how effectively teachers used technology (Blundell et al., 2016; Francom, 2016; Vassinda et al., 2017). Similarly, Brenner and Brill (2016) and Laudari (2019) found that technology use efforts were constrained by the lack of time to prepare lessons and engage in professional development activities.

Issues such as non-alignment of assessment and curriculum, attitude and support of colleagues and school culture, and student-related factors impact how and when teachers use technologies (Blundell et al. 2016; Cunningham, 2015; Laudari & Maher, 2019). Likewise, issues pertaining to organizational support and

financial resources to set up physical infrastructure influenced technology use for teaching/learning activities (Laudari, 2019). Challenges in access to technology, administrative support, and limited opportunities for professional learning are also found to constrain ICT use (Francom, 2016).

Furthermore, many researchers have concluded that the lack of training for teachers on technology use can deter technology integration efforts in education (Albugarni & Ahmed, 2015; Cárdenas-Claros & Oyanedel, 2016; Cunningham 2015; DelliCarpini, 2012; Tarus et al., 2015). For example, Laferrière et al. (2013) and Hamel et al. (2013) reported that adequate ICT support staff and ongoing professional learning opportunities for teachers involving technology use impacted technology integration into teaching practices. Other issues, such as lack of ICT infrastructure, technical support, and internet bandwidth are also argued to constrain how teachers use technology in higher education (Crawford et al. 2020; Khan et al., 2012; Lim & Pannen, 2012; Mwakyusa & Mwalyagile, 2016; Sobaih & Moustafa, 2016). For example, Albugarni and Ahmed (2015) and Al-Azawei et al. (2016) found that not having proper technological devices, internet connectivity, lack of technical support, power outages, insufficient finances, and lack of clarity in policy on online learning deterred implementation of e-learning in public universities in Iraq. Finally, issues of corruption and political commitment have also been cited as constraining factors in ICT integration in education (Khan et al., 2012). In addition to these, a study by Qureshi et al. (2012) identified issues of privacy and English language competencies hindering the use of e-learning platforms in Pakistani universities.

Research studies based in Nepal have also reported similar issues. Laudari (2019) and Laudari and Maher (2019) found that assessment design, lack of administrative support, and students' lack of digital literacy constrained technology use in higher education. Following a review of published documents, reports, and news commentaries, Dawadi et al. (2020) identified connectivity and ICT infrastructure as two important challenges to technology use. In a similar vein, Paudel (2021) reported that a reliable internet connection at home was a key issue in remote teaching/learning. In a study of English as a foreign language (EFL) online teaching practices during the COVID-19 pandemic, Shrestha et al. (2021) found "poor network … lack of technological support from institutions, [and] power cut" (p. 12) constrained online teaching in Nepal and Bangladesh.

Thus, external factors are variable in nature. These factors could be further categorized into technological, organizational, and environmental (TOE) factors following the TOE framework originally proposed by Tornatzky and Fleisher (1990). Baker (2012) argued that the TOE framework is "adaptable" (p. 237) and can help to understand what enables or constrains technology adoption. We add personal factors to the TOE framework as they can influence the technology practice of teachers. Table 1 provides a summary of the factors from the literature review, categorizing them into internal (personal) and external (technological, organizational, and environmental) factors.

Table 1. *Summary of Internal and External Factors From the Literature Review*

	Factors	Themes	Authors and Years
Internal	Personal	Teacher beliefs	Agbo (2015); Cunningham (2015); Elatrachi and Oukarfi (2020); Laudari (2019); Panigrahi et al. (2018); Tondeur, et al. (2017); Vassinda et al. (2017); Shah et al. (2020).
		Digital Competencies	Blundell et al. (2016); Ifinedo et al. (2020); McKnight et al. (2016); Nelson et al. (2016); Sipila (2014); Vassinda et al. (2017); Phelps and Vlachopoulos (2020).
		Workload	Blundell et al. (2016); Laudari (2019).
		Language skill	Qureshi et al. (2012).
External	Technological	ICT infrastructure	Agbo (2015); Crawford et al. (2020); Dawadi et al. (2020); Ghavifekr et al. (2016); Khan et al. (2012); Lim and Pannen (2012); Mwakyusa and Mwalyagile (2016); Shrestha et al. (2021); Sobaih and Moustafa, (2016).
		Internet Bandwidth	Dawadi et al. (2020); Paudel (2021); Tarus et al. (2015); Mwakyusa and Mwalyagile (2016); Reid (2014); Shrestha et al. (2021).
	Organizational	Administrative support	Agbo (2015); Ghavifekr et al. (2016); Panigrahi et al. (2018); Reid (2014).
		Time	Blundell et al. (2016); Francom (2016); Reid (2014); Vassinda et al. (2017).
		Technology access	Tarus et al. (2015); Albugarni and Ahmed (2015); Al-Azawei et al. (2016); Khan et al. (2012); Laudari and Maher, 2019.
		Lack of finance	Albugarni and Ahmed (2015); Cunningham (2015); Ghavifekr et al. (2016).
		Training	Laudari (2019); Albugarni and Ahmed (2015); Cunningham (2015); Agbo (2015).
		Policies	Blundell et al. (2016); Cunningham (2015); Laudari (2019); Laudari and Maher (2019).
		Privacy/security concerns	Qureshi et al. (2012).
		Tech Support	Khan et al. (2012); Lim and Pannen (2012); Mwakyusa and Mwalyagile (2016); Sobaih and Moustafa (2016); Shrestha et al. (2021).
	Environmental/ Infrastructural	Electricity supply	Albugarni and Ahmed (2015); Al-Azawei et al. (2016); Shrestha et al. (2021).
		Policies on technology use	Khan et al. (2012); Laudari (2019); Laudari and Maher (2019).

Purpose of the Study and Research Questions

The purpose of this exploratory qualitative case study was to investigate both supporting and inhibiting factors for teachers in higher education during the COVID-19 pandemic in Nepal. Prior to the pandemic, most of the classes in higher education were limited to face-to-face mode. Once a lockdown was imposed by the government during the pandemic, teachers had to transition into remote teaching quickly. The primary research question involved understanding how internal and external factors facilitated or inhibited remote teaching in higher education in Nepal during the COVID-19 crisis.

Methods

Nature of the Study

An exploratory case study is useful to understand a phenomenon that has not been explored and understood fully (Mills et al., 2010). This study presents a case of higher education institutions in Nepal by drawing on data collected from academics teaching various courses in programs at the bachelor's degree or higher in colleges and universities in Nepal. The primary data were collected using focus group discussion (FGD) with teachers teaching in affiliated and constituent campuses located in different regions of Nepal. Unless otherwise stated, in this study, teachers refer to the academics who were actively teaching in higher education courses, and educational technologies refer to ICT tools that teachers used in teaching activities.

Context of the Study

Higher education in Nepal does not have a long history. It started with the establishment of the Tri-Chandra Campus, the first, under the supervision of an Indian university in 1918. The first university, Tribhuvan University, was established in 1959. Currently, there are 11 universities and 1356 colleges (University Grants Commission, 2019). The colleges in Nepal are of two different kinds: constituent and affiliated. While constituent colleges are run under the direct administrative, academic, and financial control of a university, affiliated colleges do not receive financial and administrative support. However, they are operated under the academic supervision of the university that provides the affiliation. Decisions on curricula, academic calendar, and summative tests are controlled by the university that provides affiliation. Table 2 presents the breakdown of the universities, their established years, and their constituent and affiliated colleges.

Table 2. *List of Universities With Constituent and Affiliated Colleges in Nepal*

Universities	Year Established	Constituent Colleges	Affiliated Colleges
Tribhuvan University	1959	60	1080
Nepal Sanskrit University	1986	14	4
Kathmandu University	1991	9	14
Purbanchal University	1994	5	111
Pokhara University	1997	4	58
Lumbini Bouddha University	2005	1	5
Agriculture and Forestry University	2010	8	0
Mid-Western University	2010	15	1
Far Western University	2010	15	0
Nepal Open University	2016	0	0
Rajarshi Janak University	2017	0	0

Note. Data source: University Grants Commission, 2019

Prior to the pandemic, most of the universities and their constituent and affiliated colleges did not have a learning management system, and the use of technology in teaching and learning was limited. Therefore, the shift to online learning for most universities and colleges was abrupt, and they were underprepared to pivot to remote teaching.

Research Participants and Sampling

The university Human Ethics Research Committee provided the ethics approval for this study. Participants were recruited using a snowball sampling method (Bryman, 2016). Initial contacts were made via email and Viber (a messaging App) with teachers who have been teaching remotely since the outbreak of the pandemic in March 2020. They were briefed on the project objectives and requested to identify other academics from different faculties (disciplines) and institutions who could potentially participate in the study. In total, 28 academic staff participated in our focus groups. The participants have been assigned pseudonyms to anonymize and protect their identities. Summary of those participating in each of the five focus groups is given in Table 3.

Table 3. *List of Focus Group Participants*

Participants	Faculty/Discipline
Focus Group Discussion 1	
Teacher1	English language
Teacher2	Sociology
Teacher3	Accounting
Teacher4	Statistics
Teacher5	Economics
Teacher6	Mathematics
Teacher7	English Language
Focus Group Discussion 2	
Teacher8	Education
Teacher9	Nepali language
Teacher10	HPPE (Health Education)
Focus Group Discussion 3	
Teacher11	English language
Teacher12	Economics
Teacher13	Science
Teacher14	Economics
Teacher15	Accounting
Focus Group Discussion 4	
Teacher16	Nursing
Teacher17	Nursing
Teacher18	Public Health
Teacher19	Public Health

Teacher20	Community Nursing
Teacher21	Public Health
Teacher22	Psychiatry and Nursing
Focus Group Discussion 5	
Teacher23	Finance
Teacher24	Literature
Teacher25	Information Technology
Teacher26	Information Technology
Teacher27	Information Technology
Teacher28	Information Technology

Procedures

Participants interested in taking part in focus groups were provided with an information sheet and consent form via email. They were requested to return the consent form with their signatures. Focus groups were primarily conducted in the Nepali language, but the academics were encouraged to speak the language that they felt comfortable with. Therefore, some academics used both Nepali and English when they felt comfortable. All the discussions were audio-recorded and later translated and transcribed by the researchers for the analysis.

Data Analysis

Following Bryman (2016), a thematic analysis was employed. We used apriori themes based on the literature (as shown in Table 1) to group and categorize the data; this helped us frame the answer to the research question. Recorded data were translated and transcribed into English and organized into Microsoft Excel spreadsheets. Then the two researchers reviewed and categorized the data into themes and subthemes. Themes and subthemes were then assigned to each of the four categories. The three authors held meetings to review, confirm, and discuss themes and subthemes, whether they were correctly categorized, and if there was a need for additional categories. However, the four apriori categories were deemed to be sufficient to accommodate the themes and subthemes that emerged from the data.

Results

Thematic analysis showed that remote teaching practices were characterized by several facilitating and hindering factors. These are presented below using categories identified in the literature review.

Personal Factors

Table 4 provides a summary of the analyses related to personal factors. These factors, including technological skills, prior experience, and student motivation both facilitated (positively) and hindered (negatively) the remote teaching practices during the pandemic. Teachers who had existing skills and experience using digital tools in teaching and learning found the remote teaching experience easy. For example, a teacher who had used Google Meets as a student stated, "*though Zoom was new, I knew how to use Google Meet and had unlimited access to it through [my] University so I was able to use it with [confidence]*" (Teacher11). Three other teachers (Teacher12, Teacher14, and Teacher23) reported experiences of using technology like Teacher11.

However, not all teachers had the experience of teaching online prior to the pandemic. These teachers were required to learn to use digital tools with which they were not previously familiar. For example, Teacher25 said, "*even though I am an IT professional, I found it difficult to use [MS] Teams. For others who did not have any IT background, it was even a bigger challenge*." Moreover, academics with limited digital knowledge skills had additional challenges of managing their online classes, as they did not know how to deal with technical issues. This was experienced by Teacher22, who stated, "*I had a bad experience of using Zoom as one of my sessions was zoombombed while accepting everyone coming to the session, other unauthorized people also entered.*"

While some teachers faced challenges, it did not prevent them from continuing to teach online. The data revealed that this was due to their attitude towards their profession. For example, when asked what motivated them to start remote teaching without a formal directive from the university or the college, most teachers said that their sense of duty as a teacher motivated them to continue teaching from their homes. For example, Teacher5 said, "*in the initial phase of the lockdown, we were a bit lost as to what to do, but then we had a realization that we are teachers, and [that] we should continue teaching*." Teacher1, Teacher3, and Teacher7 had responses like that of Teacher5.

Other teachers opined that they should continue teaching remotely because their students, especially those studying a master's degree course, viewed the experience positively, which teachers found motivating. For example, Teacher1 said, "*students in master's level have provided positive feedback to remote teaching/learning in general, and they like online classes.*" Other teachers who also taught at the master's level confirmed this claim. Teacher25, Teacher11, and Teacher13 stated that students studying for master's degrees were positive and requested for the continuation of class remotely. Some teachers, including Teacher2 and Teacher14, noted that those students might have preferred online classes because they did not need to commute and were able to save time as most of them were working full time.

Table 4. *Personal Factors*

Factors	Influence	Count
Workload	Negative	7
Health concern	Negative	3
Language and nature of subject	Negative	1
Motivation from students	Positive and negative	13
Teacher's skill	Positive and negative	8
Technological skill/technophobia	Positive and negative	5
Moral pressure (as a teacher)	Positive and negative	3
Peer support/pressure	Positive and negative	2
Mindset	Positive and negative	1
Self-learning	Positive	3
Productivity	Positive	2

Some participants expressed their concerns and difficulties while teaching remotely in terms of increased workload; they were required to spend more time preparing and helping students virtually. Besides giving more time, they said that students, especially in the bachelor's degree programs, were less motivated and were less engaged in learning activities. Teacher18 said, "*we are taking our personal time. Even my kids were feeling it and told me that I am spending a lot more time than usual... during this pandemic. I have spent many hours helping students online during the evenings*." Other teachers (e.g., Teacher11, Teacher5, Teacher25, and Teacher26), affirmed being overworked.

A common observation by many participants across focus groups was that students were excited at the beginning of online/remote teaching. Some participants (Teacher1, Teacher2, and Teacher4) acknowledged that their students participated in online classes regularly. However, some teachers noted issues of distractions caused by background noise, technical problems, and the lack of interaction with students during the remote teaching.

Technological Factors

Technological factors refer to conditions related to technology required for successful online teaching and learning. The discussion on technological issues demonstrated that internet connection, inadequate mobile data plans, and lack of subscription for online meeting tools, such as Zoom, were identified as the factors that constrained remote teaching.

Most teachers said that students who returned to their homes in rural areas did not have proper personal devices and stable internet connections. Likewise, students from lower socio-economic backgrounds could not afford to purchase mobile data required to attend their online classes. For example, Teacher2 said, "*students originally from regional areas, who have returned to their homes when the lockdown started, do not have an internet connection*." In the same vein, Teacher19 said, "*students stopped attending the classes saying that they don't have a good internet connection*." Likewise, Teacher1 and Teacher3 stated many students who studied at affiliated campuses located in remote cities were low socioeconomic status and thus did not have proper personal devices and an internet connection required to attend online classes.

Teachers did not exclusively discuss lacking access to personal devices or having issues with the internet connection. However, some of them noted that lack of access to paid versions of Zoom or Mentimeter caused some inconveniences. Nevertheless, they found workarounds. For example, instead of using the free version of Zoom (which only gives 45 minutes of group meeting time), they used Google Meet, since it provided unlimited time. Likewise, to avoid Mentimeter, they created multiple presentations as a workaround to the limitations in questions available with free accounts. Some continued to use the free version of Zoom and asked students to re-join the session, and others moved to use Microsoft Teams. Table 5 lists factors relevant to technology across all focus groups and negative or positive views and the number of times they were raised.

Table 5. *Technological Factors*

Factors	Influence	Count
Subscription of online tools	Negative	6
Internet connection	Negative	5
Mobile data plan / Internet access	Negative	3
Interruption (drop off or noise)	Negative	2
New experience or Training	Positive	1

Organizational Factors

Organizational factors refer to the conditions at the level of university and campus. It was evident that factors such as policies and directives on online teaching, organizational support for teachers, the university's academic calendar, and exam administration influenced the remote teaching practice of academics in higher education in Nepal. Table 6 summarizes these factors.

Table 6. *Organizational Factors*

Factors	Influence	Count
Exam policies	Negative	15
University policy and directives	Negative	6
Annual academic calendar	Negative	3
Clinical postings	Negative	3
Lack of communication between the university and the affiliated college	Negative	2
Class size	Positive and negative	4
College support: Devices, power backup, free-WIFI, training	Positive	17
College policies: Initial planning meeting and review meetings	Positive	9
Semester academic calendar	Positive	3
Pre-existing condition/set-up for virtual classroom	Positive	1

Most teachers stated that the lack of clarity on conducting remote exams influenced student attendance. This issue was identified by academics teaching in affiliated campuses, which are tasked with teaching the curriculum and syllabus set by the university. The affiliating university makes the decisions about the exam schedule and exam operation, including setting up the exam questions and marking. As the university postponed the exams due to the pandemic, the teachers felt that their students were not motivated to continue attending lessons. Teacher12 said, "*The [summative] evaluation is completely based on the exam [run by the university] and that there were no exams. It meant that students did not have reasons to attend the class.*" Teacher19 also concurred with Teacher12 and stated, "*we started the teaching, but conducting the exam is very difficult; it is pending at the moment. This is not helping anyone.*"

Additionally, the affiliating university's policies on online teaching and learning also impacted remote teaching and learning. The teachers said that the university did not provide clear guidelines on time to administrators, teachers, and students about online teaching and learning. As a result, even when the colleges continued offering classes, the attendance at the undergraduate level dropped. For example, Teacher6 said, "*student interests diminished when the university's policy/directives failed to recognise online teaching and learning*." Teacher5 noted succinctly how clarity in policy impacted remote teaching and learning by saying, "*no clarity [in policy] meant we are forced to reteach the content when we are back to face-to-face mode, and students thought that online teaching is not required and is not formal and that played a role in*

diminishing student motivation." Teacher22 affirmed by saying, "*questions were raised about the validity of online classes, whether the university will approve it or not, whether that would be useful for exams?*"

Support from institutions was well received by teaching staff across all the focus groups. Most of them responded by saying something along the lines of "*we had extensive training on using different tools for remote teaching*" mentioned by Teacher2 and Teacher5. Teacher18 specifically pointed out that "*A new group of IT people to help with this remote teaching have been established*." Some teachers mentioned that their college formulated online teaching policies and communicated them to teachers and students. Teacher18 stated, "*we organised a coordinating meeting in our college to prepare and deal with these uncertain times for re-opening hostels, PCR Tests for free, quarantine, etc.... We are preparing to bring students for clinical studies*." Teacher22 also expressed similar experiences in saying, "*We ran a survey with students and decided to start remote teaching for bachelor's degree, as we had 70% responses to go ahead. University couldn't decide for us, and therefore we started [teaching] in Zoom*." Thus, support from the parent university was lacking.

Interestingly, some participants were found to be optimistic about embedding virtual classes even when the university returns to normal after the pandemic. Teacher26 mentioned, "*we should combine online and [face-to-face]. Certain percentages of the delivery should remain online, and it would be productive*." Teacher25 supported this by saying, "*I do believe that the blended method would be good for the future....*" A handful of courses apparently had already been using virtual classrooms prior to the pandemic and did not have any impact from the changes in the delivery. Teacher21 shared, "*We already have these [virtual classrooms] setups in some districts (Gulmi, Nawalparasi, Makwanpur, Gorkha). In this pandemic situation, these are very helpful, and we are discussing ways to improve them. Also, we are planning to set up in far remote districts like Myagdi, Okhaldhunga, and Ramechhap*."

Environmental Factors

In the context of this study, environmental factors include regulatory impact, macroeconomic, and infrastructural perspectives for remote teaching. Participants discussed issues related to national infrastructure such as electricity, internet connectivity, the cost for mobile data in conjunction with the economic status of students in urban and rural areas. Table 7 summarizes the emergent subthemes and their positive and negative influences.

Table 7. *Environmental Factors*

Factors	Influence	Count
National policies	Negative	3
Electricity infrastructure	Negative	2
Mobile network infrastructure	Negative	1
Remote areas	Negative	1
Cost of mobile data	Positive and negative	8
Subject nature	Positive and negative	2
Investment in technology	Positive and negative	2
Public-Private partnership	Positive and negative	1

Federal and state educational authorities did not provide clear guidelines regarding remote teaching in higher education. Teacher24 said, "*The Ministry of Education could not give a clear direction on how to go about remote teaching. We finished the first semester and then continued with the second semester without conducting the exam for the first semester because the university and the government could not make any decisions*." Teacher19 accentuated this by arguing that the educational authorities failed to learn from how educational institutions outside Nepal and a particular university within Nepal continued teaching and learning.

The situation is worsened by other national-level infrastructure conditions such as electricity availability and telecommunication networks throughout the country. The intermittent nature of power cuts also made remote teaching almost ineffective. Teacher24 mentioned, "*This [power cut] has caused issues in attendance and retention [of students].*"

Additionally, the cost and quality of mobile data have negatively affected the participants of students during the pandemic. Students from low socio-economic backgrounds did not have connections at home. Several participants raised this as an issue, but some participants stressed this by arguing that their students from remote areas were not able to join classes due to the access issues and the cost of mobile data. Teacher19 said, "*[Buying mobile data] is very expensive for students in Nepal for students in remote areas. Some students reported this as a problem…. For example, attending one class [approximately 40 minutes] using mobile data costs them up to NRs 96* [equivalent to USD 1; gross domestic product per capita is equivalent to approximately 1196 USD]." Teacher2, Teacher3, and Teacher4 concurred with their colleague. The issue of cost was further exacerbated by lack of access in some cases. For instance, Teacher21 said, "*some students are from remote areas, it is not possible to even connect them through data*." One institution took the initiative to help students. Teacher20 shared that "*The campus negotiated with NCell [Mobile service provider] to provide subsidized data plans for students.*"

Remote teaching seemed better suited for some subjects. Teacher25 said, "*It really depends on the subject, I think. For example, in my subject, English, students tend to enjoy it. Maybe other subjects like Maths, Technology, may have more problems because we are used to using whiteboards*." This position was supported by Teacher24 and Teacher23. Teacher23 said, "*Certainly, the subject matter is important for students. In my subject, students who are interested in the stock market enroll, so they fully engage in the subject. If they don't learn, they can't pass the subject. In fact, if they invest in the stock market while learning, I have seen students actually make some money as well. I provide all sorts of help till they are not satisfied.*"

Discussion

Results of focus group discussions revealed several factors that facilitated or obstructed remote teaching during the pandemic. It was evident that organizational factors such as institutional policies on online classes and examinations negatively impacted student engagement in the learning activities. Teachers noted that student attendance (in bachelor's level) dropped and motivation waned because exams were suspended. No decision was made as to when and how the exam would be conducted (Republica, 2021). In contrast, personal factors such as teachers' sense of duty and their attitude towards technology use facilitated their practice despite technological (e.g., subscription to online tools), organizational (directives on exams or online classes), and environmental (inconsistent power supply) issues.

Not all teachers felt equally comfortable in using educational technology due to their lack of skills or prior experience in using the tools such as Google Meet and MS Teams. This finding confirms findings by Roy and Covelli (2020) that teachers' prior experience with online teaching influences their comfort levels. While this finding confirms that many academics in Nepalese universities lacked skills to use technology (Laudari, 2019),

it warrants a focused approach to technology use and an opportunity to align the needs of individual institutions and teachers. As technology use can be influenced by several factors (e.g., see Blundell et al. 2016; Laudari & Maher, 2019), any professional development discussion has to be grounded on the local context to address the needs of teachers, students, and the university/college at which teaching and learning occurs.

In discussing influencing technological factors, teachers mentioned that students with low socioeconomic backgrounds could not afford internet connections and lacked proper personal devices. As a result, those students struggled to attend classes while their counterparts who could afford personal connection and devices continued their classes remotely. A prolonged disparity in connection and access to technology resulted in the equity issues and created a two-tier system of haves and have nots in higher education.

Technology issues did not hinder teachers from continuing to teach remotely. Although a few teachers did not have subscriptions to Zoom and Mentimeter, they owned personal devices and had internet connectivity required to teach online. When teachers did not have access to a paid subscription to their preferred online tools, they found alternatives. The lack of subscription to software confirms the findings of Laudari and Maher (2019) and Shrestha et al. (2021). However, unlike the finding from Laudari and Maher (2019) that the teachers did not use technology in teaching as they did not have required technological infrastructure at their colleges, participants in this study continued teaching remotely during the pandemic because they worked from their homes and used their personal technological resources.

Teachers' behavioral attributes (personal factors) helped mediate at least some technical issues. An implication of the finding related to teachers using their own resources (time, technology, and connection) to continue teaching suggests that pedagogical beliefs and attitude play a crucial role in their practice (Ertmer et al., 2012). Priestley et al. (2015) defined agency as teachers' desire and ability to act based on the available resources and constraints and judgements. As teachers used their judgments and decided how they could use educational technology to engage students in remote teaching based on the resources and options at their disposal, agency possibly played a role in the continuation of remote teaching. As evident in the findings, teacher communities played a crucial role in helping them continue their lessons. Such communities provided a platform to share common problems and experiences and learn from each other while also building a sense of community, which is essential for their wellbeing.

It was also evident that the organizational support in the form of training and technical support facilitated remote teaching. However, university policy/directive on remote teaching and assessment hindered teachers' practice. It was seen that universities with large enrollments, mass affiliation, and a centralized system of administration, particularly with control over examination and curriculum, were ill prepared for remote teaching. While affiliated campuses started teaching, the absence of university directives and lack of instruction on summative assessments meant that the teachers/academics had challenges retaining students in their classes.

Implications for Future Research and Practice

Universities and colleges should learn from this experience of remote teaching and assessment, devise policies on using technology in teaching and learning, and invest in relevant infrastructures to move towards a blended approach to teaching and learning in the future (Benito et al., 2021; Shrestha et al., 2021). Educational authorities can support teachers in higher education by providing more explicit guidelines on teaching and learning and assessments in multiple education situations, including those that occur during a pandemic or any other emergencies. Future research should consider collecting data from a larger number of participants and include both teachers and students to explore whether the experiences of remote teaching and learning differed by regions and grades of students. As remote teaching entailed pivoting of all activities

online, it may also be useful to consider teachers' learning design strategies and approaches in remote teaching in future research.

Limitations of the Study

The main limitation of this study is that it is based on qualitative data only and should be validated using quantitative tools that can reach more faculty and students. This would allow for broader generalization of the findings. Due to time constraints, we could not observe teachers' online classes, which would have helped gain in-depth insights into their pedagogical practices.

Conclusion

This study demonstrates that while organizational factors, such as policies on examination, professional development support, and technology integration constrained remote teaching, internal factors, such as teachers' attitude, beliefs, and self-guided learning, facilitated teaching online. Thus, personal factors are critical in successful technology use. COVID-19 has affected the economy, education, and lives of the people of Nepal. However, in Nepal, as in other regions, the pandemic has sped up technology uptake and integration. The pandemic made teachers aware of technology and required them to search for avenues to enhance their skills to integrate technology into learning. The pandemic also made the general society aware of the important role of technology in the continuity of educational activities during a crisis. We contend that higher education institutions should leverage the experiences of online teaching and learning and embrace a more blended approach.

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