

Experiences With Online Teaching During COVID-19 in Latin America: Digital Divide, Digital Literacy, and Lessons Learned

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Abstract

Due to contact restrictions during the COVID-19 pandemic, many universities around the world had to adapt their teaching to online formats. The adoption of online teaching during the COVID-19 crisis caused numerous changes in higher education. The circumstances given in particular regions led to diverse forms of modifications. In this process, according to digital divide theory, greater inequalities may occur among students with different socioeconomic circumstances. This article presents insights into how students in Latin America perceived the occurring changes. By applying a qualitative methodology in four countries, we were able to show how the scarcity of resources affected the learning experience. Amongst others, the results show disparities among students due to difficulties with Internet connectivity and lack of access to digital devices. Different levels of technical and psychological requirements for online teaching were found among students from Chile, Mexico, Peru and Guatemala. Especially between students from urban and rural regions, differences in access to the Internet can be identified for Latin America.

Keywords: online teaching, COVID-19, Latin America, digital divide

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Introduction

Preventing contact was the most effective measure against the COVID-19 pandemic in the beginning and before vaccines were available. Universities had to quickly adopt digital and online

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teaching (Mandl, 2021; Pedró, 2020). Availability of hardware and access to the internet became decisive factors for students for the continuation of their education (Ciotti et al., 2020). The transition from face-to-face to digital teaching required also technical and psychological adjustments. The acceptance of online teaching also depends on cultural differences (Jung & Gunawardena, 2023).

Higher education institutions were not always well prepared for this situation and this resulted in negative experiences as well as limited access to education. The COVID pandemic and the switch to online learning might have aggravated the situation of disadvantaged student populations and it might have further increased the digital divide. This research intends to identify factors influencing the experience of university students in Latin America (specifically in Mexico, Chile, Peru, and Guatemala) with online teaching during the pandemic.

The overall research questions for this study were:

- (1) How did students in higher education institutions perceive teaching during the COVID-19 pandemic and its impact in Latin America?
- (2) What impact did the digital divide have on online teaching and students during the COVID-19 pandemic in Latin America?

The remainder of this paper is structured as follows. The state of the art briefly introduces the concept of the digital divide and then reports on research about digital education during the COVID pandemic. The last part of the state of the art reports on research regarding Latin America. The next section introduces the methodology adopted for this study. The section Results elaborates the results and is followed by a section with a discussion of these. A short conclusion sums up the article.

State of the Art

Digital divide is a theory that states that access to the internet and information and communication technology (ICT) has an impact on the development opportunities of people and society. The research on the digital divide examines access to hardware, such as computers and smartphones, as well as services and their quality (such as connection bandwidth), as well as software, such as search engines, social networks, and databases (van Dijk, 2006).

Currently, research on the digital divide also increasingly recognizes that in addition to access the use of ICT impacts the opportunities of people (van Dijk, 2020). Computer literacy and in particular information literacy (Griesbaum et al., 2021) play a big role in how citizens can benefit from technology. Nevertheless, access to hardware and fast network connectivity can enable people to obtain better participation in education programs (Dimaggio et al., 2004). Even the place of residence may affect the chances to participate in online learning. Furthermore, income and educational level affect the availability and consequently, the familiarity and literacy regarding ICT (Claro et al., 2015). For online teaching, a private and undisturbed workplace is also a requirement (Bohnenkamp et al., 2020). The change to online teaching or emergency remote teaching during lockdowns led to the development of many forms of digital education (Phillips, 2022). However, there have been barriers to the adoption of innovative teaching practices (Krtalić & Mandl, 2019) and they did not disappear when the pandemic came. Among the success factors for teaching and engagement of students, their attitude is quite important. The attitude toward online teaching was found to be different between ethnic subgroups within a university in California (van Wart et al., 2020). The effect of the pandemic on teaching has been analyzed in many contexts. For India, several ethical and social concerns of students and faculty were found. These included the fear on loss of privacy due to

the danger of being recorded. Low computer literacy a lack of motivation to acquire them was pointed out as a barrier (Bhattacharya et al., 2022).

In Australia, teachers felt competent, but unprepared and overburdened (Bast, 2021). Also in the US, low satisfaction of faculty with online teaching was confirmed in a questionnaire study (Dumont et al., 2021). Results for Europe showed that the boost in digital education during the pandemic did not lead to a pervasive generation and use of open educational resources (Boté-Vericad, 2021). Studies for Catalonia showed that better digital competencies were correlated to active participation in online education (Rivera-Vargas et al., 2021) and that the digital skills of teachers are rather basic (Boté-Vericad et al., 2023). In a comparative study, the attitude toward self-directed and online learning was identified as an important influencing factor for the success for Mexico (Aguilera-Hermida et al., 2021).

For Latin America, the technological equipment of universities has been a major barrier for digital education (Pedró, 2020; Salas-Pilco et al., 2022). In addition, schools had problems with resources like network connective and learning platforms as a study for Mexico and Chile shows (Rieble-Aubourg & Viteri, 2020). A quantitative survey study in 2020 analyzed students' experience with online teaching in Mexico. They found that more than half of all participating students had problems with Internet connectivity. Private institutions typically provided greater technical resources, internet access, and logistical conditions like a peaceful, undisturbed workplace for students visiting them. Additionally, private university students reported using more technological resources and digital tools both before and during the pandemic, while public university students found the move to online learning challenging (Zapata-Garibay et al., 2021). Even in a survey, which found a medium level of satisfaction with virtual teaching, still identified needs regarding access to digital resources and socioemotional needs (Quispe-Prieto et al., 2021).

A research conducted after the transition back to regular educational procedures suggested that there may have been a favorable effect. In three countries in Latin America, students stated that pedagogically adequate and active learning scenarios were helpful when combined with diverse feedback practices (Lobos et al., 2023). According to a study conducted for a university in Colombia, the COVID-19 pandemic has caused students to consider the digital divide as having grown. The quantitative study concluded that people of lower socioeconomic strata suffered more from the shift to digital education and that gender affects participation in online teaching and the frequency of use of the educational tools (García-Martín & García-Sánchez, 2022). A bandwidth of tools was used for digital teaching and the intensity of the use increased during the pandemic within Latin American countries (Antón-Sancho & Sánchez-Calvo, 2022). The competencies necessary for digital learning were analyzed for six Latin American countries and a range of differences was observed (Pérez Escoda et al., 2021). Ecuadorian students reported having trouble with self-regulated online learning (Molina Gutiérrez et al., 2021). A systematic review of the literature points out the digital and soft skills of students needed to be developed (Salas-Pilco et al., 2022). Most of the cited work takes a quantitative approach. There is a lack of qualitative studies to better understand the relationship between the condition of students and their learning experiences.

Methodology

Individual interviews provide the opportunity to explore experiences and opinions that are to be found in the present work. For this purpose, a semi-structured interview was chosen as the survey method, as it offers a certain compromise between openness and structure (Luo & Wildemuth, 2017). The openness of an interview allows unanticipated aspects to be discovered and asked about in more detail (DiCicco-Bloom & Crabtree, 2006). Unlike a questionnaire, an interview guide is a

list of question options whose order can be changed, questions can be skipped, or questions can be revisited (Kvale, 1996). A survey of students in the form of focus groups was deliberately not carried out. The reason for this was due to the organization and availability of the students. According to Kendall (2008), individual interviewing is useful for research questions that involve individual perspectives, attitudes, and habits and that only the individual can answer.

Target Group and Sampling

Unlike a quantitative research approach in which participants are randomly selected, a qualitative research approach uses specific criteria to select participants (Creswell, 2012). These criteria derive from the research topic and were defined here as follows. For the sample, we aimed to find individuals who studied or started studying at a university in Latin America during the COVID-19 pandemic, as of March 2020. In order to find potential participants to conduct the interviews, both private and university contacts were utilized.

The researcher’s private network included contacts to Peru and Mexico, while further contacts to Mexico, Chile and Guatemala were established through university institutions such as international offices. The selection of countries in Latin America was based on the availability of potential interview partners. After volunteers from Mexico, Peru, Chile and Guatemala had already registered, the focus was on these countries and the search was exclusively for further participants from these countries. In order to be able to analyze the situation in different countries in Latin America, the number of countries was limited to four during the recruitment process. The sample thus consisted of participants from Mexico ($n = 6$), Chile ($n = 3$), Peru ($n = 3$), and Guatemala ($n = 2$), resulting in fourteen interviews. With a total of fourteen interviews, it was possible to ensure that there were at least two or three representatives from each country and that differences and similarities between the countries could be identified. Table 1 shows more details about the participants.

A pre-survey, in the form of an online questionnaire, was used to collect mainly demographic data. It also offered a free-text entry option in which participants were asked to depict how teaching occurred during the pandemic at their university. This was mainly to prepare for the following interview, as well as to get a better understanding in advance of what impact the pandemic had on the form of teaching at the participants’ respective universities or countries.

Table 1

Features of the Participants

Type of University	Private: 4 Public: 10
Universities	Overall: 8 Per country: 2
Degree programs	Marketing, Economics, Pedagogics, Nursing, Social Work, Law, Computer Science, Civil Engineering, Technology Management
Level of study	Comparable to BA student: 13 Comparable to MA student (Licenciatura): 1
Start of studies	Before the pandemic: 10 During the pandemic: 4
Home	City: 10 Rural Area: 4
Age	Between 19 and 25

Despite a good understanding of the Spanish language of the interviewer, there is still a certain language barrier, since in a conversational situation such as an interview, region-specific slang words and dialects can also occur. Therefore, the preliminary interview was used to get a first impression of the situation and the course of the teaching during the pandemic and to be able to specifically address certain aspects in the interview. The participants were between 19 and 25 years old at the time of the interviews. Ten of them reported living in a city, while four tended to live in a rural area or in the countryside. In total, the fourteen participants studied at eight different universities, resulting in two different universities per country. Of these eight universities, three are private and five are state institutions, resulting in a distribution of four students studying at a private university and ten students attending a state institution. While thirteen individuals indicated that they were pursuing the *Pregrado* degree, which is equivalent to an undergraduate or bachelor's degree, one individual indicated that they were pursuing the *Licenciatura* degree, which is comparable to a diploma.

Furthermore, four people indicated that they were in *preparatoria*, a type of pre-study. Three others were in the first semester of their studies, and seven of the participants were between the second and ninth semester. The subjects studied by the interviewees ranged from languages, marketing, education, nursing and social work to law, economics, computer science, civil engineering and technical management. Information on gender was deliberately not collected, as the comparison between genders is not relevant to answering the research question and has the potential for a separate study.

Interview Guideline

We applied an interview guideline from the *DECriS* (Digital Education for Crisis Situations: Times when there is no alternative) project, with six thematic topics and a total of 38 questions (Botè-Vericad et al., 2022; Santos-Hermosa et al., 2024). Table 2 shows an overview and description of each category. The full guideline is shown in the appendix. The *DECriS* project assesses the status of Open Educational Resources (OER) use in information science at European universities during the COVID-19 pandemic. It identifies barriers to their use and present examples of best practice. Students and lecturers from the five partner universities were involved in different studies in order to

Table 2

Research Topics and Theme Description

Theme	Description
Attitudes and expectations	Students attitudes and expectations toward distant and online learning were identified, analyzed, and categorized
Problems and potentials	Examine and classify the problems that students have encountered, especially with regard to OER and online teaching
Adaptability	It is crucial to identify and evaluate the kinds of adjustments and levels of adaptability that students have made in response to unexpected circumstances
Advantages and disadvantages	Examine and categorize the justifications given by students in the event that they anticipate ongoing use (or none) of DE tools that were tested during remote teaching
Improvements	Categorize student suggestions for improvement of online teaching and learning, the use of OERs in the future, in the event of new crisis situations, or in standard teaching

assess the current situation. *DECriS* is particularly concerned with the difficulties for languages with few resources. Since the interview guide covers various topics, this study focuses on experiences with online teaching during COVID-19 from the students' perspective.

In order to give participants an initial impulse to tell their stories, the first question asked to start the interview was how teaching was implemented at their university. This referred back to the preliminary survey and also served as a warm-up question to prepare for the interview situation (Luo & Wildemuth, 2017). In the process of formulating the interview questions, they were reflected upon and examined with regard to their methodological suitability before data collection (Helfferich, 2011). Simple questioning of facts should be avoided; instead, the questions were formulated in an open-ended way, without aiming at a specific cognitive interest (Creswell, 2012).

Data Collection

Since an in-person interview was not possible for this research, online interviews were conducted because they are the closest to face-to-face exchanges (Flick, 2018). Communication about the procedure and arranging appointments with the potential interview partners took place via email or *WhatsApp* Messenger. The following interview took place via Zoom between May and June 2022. Due to the time differences from Germany to Mexico, Chile, Peru, and Guatemala of six to eight hours, the coordination of the appointments was challenging. In addition to finding appointments, communication in advance also served to provide participants with access to the pre-interview survey, as well as the consent form for recording the interview. Participants were informed of the data collection and processing through a consent form, which included a statement that participation was voluntary and could be terminated at any time without explanation, and that the data collected would be deleted upon completion of the project. The interviews lasted between 16 and 48 minutes. The recordings were then transcribed via *Happy Scribe* an online machine transcription program. The tool was the choice as it supports Spanish transcriptions, is cost effective and meets high privacy standards. Passages not recognized by the online tool were added manually, as well as errors were corrected. In case of ambiguities and comprehension difficulties on the part of the researcher, an additional first speaker was consulted, who was only given access to individual statements and not to entire transcripts or personal data.

Data Analysis

The interview data analysis was conducted using qualitative content analysis according to Kuckartz (2019). By classifying texts and designating categories, this style of analysis decreases the complexity of texts. The research questions, which serve as the process's compass and establish the foundation for all subsequent analysis processes, is at the core of the analysis. In this respect, content analysis according to Kuckartz (2019) differs from that of Mayring (2004), as the process according to Kuckartz (2019) is not linear, but changes can always be made and aspects are taken up and added to the category system in the process. The content-structuring approach focuses on identifying selected content-related aspects in the material and describing the material in terms of these aspects. Subcategories were thus formed along the material, with assignment to the deductive main categories. For this process, the software MAXQDA was used. The process was carried out by one person. The main categories were influenced by the themes of the main questions in the interview guideline. After thorough analysis and coding, two hierarchical levels of codes seemed sufficient.

Results

This section presents the results. [Table 3](#) shows the main categories that were developed as well as the subcategories. In the following, the results are elaborated. We focus on findings that are relevant for answering the research questions.

Table 3

Main Categories Ordered by Their Frequency and the Corresponding Subcategories

Main Category	Subcategories
Attitude	Negative Neutral
Expectations	Teaching and Learning Technology and Internet Course of the Pandemic Other Expectations
Changes and Adoption	Technology and Internet Teaching and Learning Introduction and Guidance
Problems and Potential	Technology and Internet Teaching and Learning Psychological Issues Financial Issues Physical Issues Social Interaction Practical Experience Transport
Advantages and Disadvantages	Transport Communication and Involvement Attention and Concentration Location dependence and independence Technology and Internet Platforms Access to Education Social Interaction Practical Experience Separation Financial Issues Other Advantages and Disadvantages
Optimization and Perspectives	Technology and Internet Digital Literacy Platforms Financial Issues Learning Activities and Learning Material Other Optimization Future Perspectives

Experience With Online Learning

Exploring student's experience with online teaching, participants report a broad spectrum from no use of online platforms at all to the use of online platforms to organize remote teaching. Students from Guatemala reported that their universities did not use online platforms to offer remote teaching (P7, P8). A student from Guatemala reported that at the beginning of the pandemic, an internal university platform was set up, which was used to communicate and organize studies, but also to upload assignments and view grades. External tools such as Google Meet were only used for online teaching later in the semester.

In Mexico, the participants' universities did not use common university platforms. Instead, professors made individually use of publicly available websites such as *Schoology*. However, the use of these tools depended heavily on the instructor and was not organized by the university in general. Here, assignments could be uploaded and grading could also be done (P1, P2, P6, P9, P10):

Each teacher had their own way of grading, and in some cases we were asked to use certain platforms to submit assignments. But everything else was in attendance. [...] That is, almost everything was always handed in personally, and only in very few subjects we were asked to use platforms such as Schoology. We used that a lot to upload homework. (P1)

One participant reports that students had to adjust to the use of different platforms at first, as they had no prior experience with them.

Before the pandemic, we didn't have a proper foundation for online classes. I mean, there were no platforms, we had no user profiles or passwords to access online courses. Before the pandemic, I never had an online course. Never. I don't think we were prepared for what was happening because, as I mentioned, we didn't know how to use platforms. (P2)

A major change in teaching and learning has been the learning space for students, which had shifted from the university to the student's home.

I think a big change was the place of learning [...] it's not the same to be in a classroom as a group or everybody in their own home. Because at home there are a lot of distractions that prevent learning in a certain way. I think a big change was the learning space. (P4)

Students received support from the university in the form of recordings of teaching (P11), loans to borrow devices or tools (P3, P8, P14), and provision of Internet in the form of scholarships (P2, P9) or issuance of sim cards (P5, P13). Moreover, students received paper materials at the beginning of the pandemic in case the Internet did not allow connection to online courses. However, this option was rarely used and tended to result in dropouts:

[...] if you couldn't connect, they gave you printed material that you had to hand in at the end of each semester. [...] So it was complicated for them, and I also think that was one of the reasons why a lot of them dropped out. (P10)

Digital Divide

Students discussed issues related to the concept of the digital divide focusing on access to digital resources and increasing cost expenses to participate in online teaching. Thirteen of fourteen

respondents reported using their own room as their primary learning space. One person reported participating in online teaching from a shared room. In addition, students highlighted that online teaching changed their daily lives in the sense that they had to reorganize their studies due to the shift to remote teaching (P5, P9, P10, P11).

So it was quite a shock when I first came to university and was confronted with a completely different kind of study. They always say that at university you have to be more independent and on your own. And I feel like that was much more the case with online classes. (P11)

The most frequently mentioned problem was that of bad Internet connection. The Internet was slow, often failed or was overloaded and depended on whether the participants lived in the countryside or in the city, as this was a frequently mentioned reason for a poor Internet connection. Respondents from Chile indicated that they lived in the city. They described that their Internet connection was relatively good, with occasional dropouts, but it was compensated with class recordings (P11, P12).

The internet connection was relatively good. I would say it was fast, but sometimes the connection was interrupted. Like I said, sometimes I couldn't attend class and had to watch the recordings because my internet connection was down. (P12)

A student from Chile, on the other hand, explained that there was no WLAN access available and that he or she therefore used mobile Internet to connect to the Internet.

There is no WLAN here. I have to have a prepaid or mobile plan to be able to share the internet. (P14)

According to P7, affected students used the WLAN connection at their workplace in the city to participate in online teaching from there. P8 from Guatemala also described that he or she has gone out to a restaurant when the connection at home was poor or slow. All three participants from Peru (P3, P5, P13), two of whom live in a city and one in the countryside, reported a poor Internet connection that affected their participation in online classes. This was mainly because they paid for a certain data volume and as soon as this was exhausted, the Internet speed was reduced. It therefore depended very much on the financial situation of the person or the family whether more data volume could be paid for per month and whether the Internet speed is faster throughout the month.

We don't all have the ability to pay for good internet, so that was a limiting factor sometimes, let's say, the megabytes of transfer rate or something like that would run out and the speed would go down [. . .] Well, sometimes uploading tasks took a long time, it took a long time to upload our files. (P3)

Furthermore, three out of four respondents from Mexico, who lived in the city, stated that they often had problems with the Internet. They reported that, as a result, they were forced to move to another space that could have more disturbing features. In this context, shared spaces within the apartment building as well as Internet cafes and moving to friends and relatives with better Internet were mentioned (P1, P9, P10).

So there was a time when I had to sit next to the modem so that the connection wouldn't break. And that was a problem because the modem was in the kitchen and everybody was there, everybody was eating or my mom was cooking. And I told them, Hey, I have to attend my class, please, give me a chance. So

everybody had to go, and I was sorry, but if not, I couldn't attend my classes. Yeah, that was pretty annoying. (P1)

With regard to technical problems, two participants mentioned that in addition to slow or overloaded internet, power outages meant that they could not participate in online classes (P3, P11). According to P3 from Peru, these power outages occurred frequently and put the affected students at a significant disadvantage.

The internet connection also depends on if it rains too much or if there were power outages here, sometimes the power outages are all day long. And sometimes, I think, the antennas also work with this power and then there is no reception and I have no light. (P3)

In addition to the Internet, the problem of the required technical equipment, which was not available for all students, is mentioned by students from Mexico, Peru and Guatemala. Four of the fourteen participants stated that it was a problem for them not to have had a computer or laptop at the beginning of online teaching (P1, P5, P7, P8). Therefore, they used their smartphones to participate in online teaching at the beginning (P5, P7), but it was perceived as a disadvantage because of smaller screens and limited functionalities.

I didn't like the virtual teaching because I only had my cell phone, so I couldn't see exactly what was being done. For example, something was being taught with the computer screen being shared by the lecturer, and they were teaching us how to use Excel or something like that, for example. It was very difficult for me to see this and not have a computer. And when I took the exam, I had to go to an internet cafe to take the exam. So it was quite complicated until, well, until now I have a computer and everything. (P7)

In case of online teaching, four students had to buy a new computer. One participant stated that he or she took a loan in order to be able to finance the purchase of a computer, which still had to be paid off at the time of the interview (P8):

I had to take a loan to be able to buy it, and I am still paying off the loan. (P8)

Another problem mentioned in this category was the workload, as the constant accessibility and less coordination among lecturers increased the task load (P4, P6).

Tension was increased because it was now easy for lecturers to leave an assignment at any time, so suddenly a lot of homework was received and the workload increased. Also because one lecturer doesn't know that another lecturer has already left five assignments and he sends another five assignments. That's when a lot comes together for one. (P4)

Digital Literacy

Aspects of digital competence were discussed as both a problem and a potential for online studies. In this context, some students were overwhelmed when using digital platforms, as prior to the pandemic they were mainly working with physical materials and were used to in-person teaching. As a result, students primarily reported a negative attitude towards online platforms at the beginning of the pandemic (P1, P2, P7, P8).

Before the pandemic, we didn't have a sufficient basis for online classes. I mean, there were no platforms, we had no users or passwords to access online courses. Before the pandemic, I never had an online course. Never. I don't think we were prepared for what was happening because, as I mentioned, we didn't know how to use platforms. (P2)

Another problem mentioned several times was the digital competence of the lecturers. Since they were older, they were less able to cope with technology in general and the digital platforms (P1, P7). As a result, a lot of time was spent solving technical problems instead of teaching, especially at the beginning of the pandemic (P6, P10, P11).

We lost time. [...] So we spent almost half of the course solving technical problems, more than anything else. When it was young lecturers, maybe it wasn't so complicated, but here in Guatemala the lecturers, yes, they are over 50 years old, they and their tutors, so yes, it has become much more complicated. (P7)

Another frequently mentioned issue was related to learning. Six out of fourteen respondents stated that they felt they learned less during online teaching compared to face-to-face teaching (P1, P2, P4, P5, P6, P9). These problems had mainly occurred at the beginning of remote teaching, as later the use of platforms was seen as a potential overall. Many students saw it as an opportunity to learn how to use them and gain experience (P6, P10). In addition, the use of platforms had simplified processes and made many functions available in one place (P2, P3, P6, P9).

I think this pandemic has also helped us discover new applications and new ways of teaching and learning. (P6)

Three respondents from Chile described that online teaching had not negatively affected the quality of their studies. However, P1 and P10 stated that they had to extend their studies due to online teaching, while P13 saw online teaching as an opportunity to continue studies at all. P11 mentioned digital literacy as a great potential to improve through online teaching in the area of digital competencies. Students have learned about new digital tools and websites.

So I learned which pages to look on, how to do it. I've discovered different tools that allow me to see locked papers, for example, or ones that are behind a paywall. Or even improve the way I search for papers. (P11)

Lessons Learned

Based on the students' experiences, the implications of online teaching for the future were discussed. P6 and P10 assume that face-to-face teaching will have a greater importance. P6 believes that students will appreciate face-to-face teaching and its benefits more after experiencing online teaching. P10 fears that by returning to in-person teaching, students will regress again because the knowledge and skills built up during online teaching will decrease.

In terms of the changes with online teaching, I was talking to a faculty member about this. He said that the current use of online tools is pointless because we are going back to in-person teaching anyway. I feel that [online teaching] should continue because no one knows what will happen in the future. When the pandemic started two years ago, no one expected it and no one can say it won't happen again or that it will last longer. [...] I see a technological regression, because we have just now expanded our minds, so to

... speak, in terms of technological systems, but going back to school means that we see a technological regression. (P10)

One student assumed that the advantages of online teaching would be implemented in face-to-face teaching, for example, by continuing to use the online platforms (P1). P5 and P9 also thought that universities will offer a hybrid form, in which students can choose to participate in face-to-face or online teaching. However, it was not unlikely that after the COVID-19 pandemic, crisis situations will occur again in which online teaching will be a way to continue studying (P4, P12, P14).

[...] Pandemics can happen again and again, for example, years ago we had the plague and now we have COVID-19. [...] Therefore, online teaching will always be a support or a solution to all these problems that may occur. (P12)

Discussion

This paper explores the experiences of students in Chile, Mexico, Peru and Guatemala with digital education during the COVID-19 pandemic. The results show how they adapted to digital and online learning during this emergency situation. The findings highlight differences among the students caused by issues due to Internet connectivity and a lack of access to digital tools (like Learning Management Software). Through the qualitative research process, participants were able to reflect sensitive issues that they might not have brought up in a focus group out of concern for their reputations. The categorization of the data further demonstrated that qualitative content analysis was well-suited for this study. Regarding the initial research question and similar to previous work (Pedró, 2020; Salas-Pilco et al., 2022) the major barrier for digital education as perceived by the students was the technology infrastructure of their respective universities. In this context, the results illustrate that students have very different experiences with online teaching and the use of digital tools, depending on the type of university. Previous studies (Zapata-Garibay et al., 2021) also reported that students visiting private universities typically enjoyed better conditions for their studies such as an undisturbed workplace, and access to technology like the internet in comparison to students at public universities. Several social and emotional concerns were found. Students highlighted that they learned less in the online setting compared to in-person teaching, negatively affecting their regular study time and resulting in dropouts. A previous study for Latin America also highlighted students' issues with self-regulated learning in online settings (Molina Gutiérrez et al., 2021). As a consequence, it becomes clear that the perception of online teaching does not only depend on familiarity and knowledge of ICT (Claro et al., 2015) but also on socioemotional needs (Quispe-Prieto et al., 2021). Socioemotional needs are presented primarily in the categories of digital divide and digital literacy. Students had to adapt to the new situation of online teaching and find solutions on their own in order to continue their studies. More support from university counselling services to help students overcome potential psychological problems and, for example, introductory courses on the use of digital tools would have been desirable.

Regarding the second research question concerning the impact that the digital divide has on online education among students, the results indicate that disparities between rural or remote areas and cities had an impact for them, as there were frequent reports of fellow students living further out in the countryside being affected by serious internet outages, which strongly influenced their participation in online classes.

Students believe that the COVID pandemic is deepening the digital divide. For example, the abrupt shift to online teaching demanded an increased internet use (Antón-Sancho & Sánchez-

Calvo, 2022). The ability of students to pay for access may hinder them from accessing digital learning platforms due to their financial capacities. The issues associated with limited internet access or power outages by students have become more severe in rural regions as a result of COVID-19. Not all participants in our study owned own laptops or desktop PCs in addition to smartphones before the pandemic. Additional costs arose therefore not only from higher electricity bills but also from the purchase of tablets or laptops, which enabled or facilitated participation in online courses. Similar to previous results (Ifikhar et al., 2023), students with a lower socioeconomic background faced barriers to digital education, as they did not have modern technology available.

There are a few aspects to consider that prevent the results from being generalizable. We presume that students who volunteered for the online interview had the basic technical capabilities to ensure a stable internet connectivity. As a result, those who could not even meet the technological requirements were not qualified for the online interview format. As a result, conducting in-person interviews could be taken into consideration for future research. Also, only students who are presently enrolled in online courses or who have finished them were interviewed. Therefore, this study could not include students who failed online courses and did so because they lacked the necessary technical and psychological skills. These viewpoints might also be taken into account in future research. Not only technical requirements have to be discussed. Students who are more likely to come forward for an interview are those who are comfortable talking about their situation while studying online, rather than those who are more uncomfortable doing so. For this, in addition to the qualitative survey, data could have been collected within a quantitative survey, for example, through an online questionnaire. These include questions on aspects of experience and perceived barriers to online learning, digital divide or mental health, to validate the findings using statistical analyses. In doing so, the representativeness of the results could have been checked additionally. However, the scope of this work does not allow for a comprehensive interview and quantitative survey in this form. This work therefore represents a basis for further research.

Conclusion

This paper offers insights into how Latin American students perceived the shift from in-person teaching to online learning during COVID-19. Utilizing a qualitative methodology, we were able to demonstrate how the lack of resources impacted the way students learned in four different countries. Especially, the differences between rural areas and cities had a strong effect for Latin America. In order to limit digital exclusion and to improve digital skills in higher education, universities need to not only be aware of digital divide among students, but also understand the severe impact of remote learning from the perspective of students.

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Supplemental Material

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