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Virtual education during the pandemic from the perspective of Peruvian teachers in rural schools

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Abstract. Because of the COVID-19 pandemic, educational systems migrated in their entirety to the virtual modality, resulting in social, technological, psychological, and other challenges. In this context, rural schools, whose various shortcomings predate the pandemic, became a setting where teaching work and, consequently, student learning was harmed in various aspects. This research sought to collect the experiences that secondary school teachers working in rural areas of Peru employing virtual education during the COVID-19 pandemic. The methodology was qualitative and phenomenological. Interviews were conducted with 23 teachers. The findings show that the initial impact of the school closures drastically changed the educational dynamic, leading to great uncertainty; in response, teachers went out in search of their students despite the geographical and technological difficulties. Likewise, the digital gap worsened, teachers did not receive help from the educational authorities, family support was often inadequate, and educational programs were limited, stifling learning opportunities. Everything would indicate that the pre-existing educational, social, and technological gaps in rural areas have worsened and it is hoped that new public policies will address this problem as soon as possible.

Keywords: Virtual education, teachers, rural school, digital divide, learning.

1. Introduction

The primary measures implemented around the world to mitigate the effects of the COVID-19 pandemic were social distancing, mandatory confinement, and restrictions on education (Bourouiba, 2020), all of which affected people's wellbeing and triggered widespread feelings of solitude, (Vaillancourt et al., 2021), fear, and anxiety (Adıbelli & Sümen, 2020). Adolescents, in particular, suffered negative consequences in terms of their physical, social, and psychological health (Fiorillo & Gorwood, 2020). The education sector was among the most severely hit by the pandemic: all education centers were forced to adopt distance modalities, affecting the enrollment, attendance, and learning dynamics of millions of students (Selvaraj et al., 2021). As Engzell, Frey, & Verhagen (2021), point out, COVID-19 represented a unique challenge for which no government was prepared, insofar as none knew how to apply the lessons learned from past crises.

The closure of schools and the pressure to stay on schedule may have been the main factors behind the adoption of remote education (Selvaraj et al., 2021), leading to a rapid shift to this modality once the public health crisis broke out (Hermann et al., 2021). A measure this exceptional severely affected students, (Vlachos, Hertegård, & Svaleryd, 2021), while parents, families, and school staff were all taken aback by the abruptness of the changes (Bayrakdar & Guveli, 2020). The transition to virtual learning entailed a "reassignment" of responsibilities, supervision, and support from the school to the home (Bayrakdar & Guveli, 2020) in which, according to Pozas et al. (2021), many parents were unacquainted with the course contents or the necessary pedagogical skills, and were unaware of how to learn the technologies involved. In turn, many teachers had no experience with virtual classes and were ill-equipped to carry out proper monitoring of the virtual environment (Gudmundsdottir & Hathaway, 2020), which meant learning new ways of teaching as they went along (Mælan et al., 2021), through trial and error.

According to Akinbadewa and Sofowora (2020), online education presents many advantages, such as the potential to promote lifelong learning (Alharthi, 2020) and markedly reduce the costs of education (Harrison & Lee, 2018) even though educators are in a different location to their students and are subject to time constraints (Weinhandl et al., 2020). Meanwhile, Nguyen (2015) remarks that online classes can have the same value and effectiveness as in-person ones, provided that they are adequately structured. The educational content, connectivity, videos and other learning resources, monitoring by teachers (Muthuprasad et al., 2021), and access to the necessary materials and equipment are all essential to this, and any

shortfall can adversely affect teaching and skills development (Code, Ralph, & Forde, 2020). In a virtual environment, student motivation, satisfaction, and interaction are three areas in which the behavior and the effects differ from those witnessed in in-person settings (Bignoux & Sund, 2018).

For Capelle et al. (2021), there is a positive relationship between the perception of learning and the frequency with which teachers contact their students. Moreover, motivation is linked with perceived value and the interest that the activity generates (Lazowski & Hulleman, 2016). Thus, the use of innovative strategies is vital to fostering participation, learning, and skills development (Bray et al., 2021). In the context of the pandemic, teachers often exhibited transformative and creative skills while challenging the traditional practices, programs, and resources that had been in use up to that point (Colville et al., 2021). Nonetheless, the limited direct contact between teachers, students, and the school environment posed a huge challenge for everyone, with frequent negative repercussions on the state of mind, emotions, and health of students and teachers (Pozas, Letzel, & Schneider, 2021).

Given the importance of the conditions in which virtual classes are taught (Dietrich, Patzina, & Lerche, 2021) and the effects on learning quality of technological access and digital efficiency (Muthuprasad et al., 2021), there is an ongoing public and academic debate about the impact of distance education on educational opportunities (Dietrich et al., 2021). According to Hebebci et al. (2020), opinion is divided on distance learning; for instance, Code et al. (2020) explain that teachers consider face-to-face interaction and engagement to be very important, and attribute plummeting attendance and participation rates to the absence of these factors. Moreover, teachers have expressed dissatisfaction over being "constantly" connected, and over the initial lack of training on working from home (Colville et al., 2021).

Ariyanti and Iman (2020) find that unreliable internet coverage, a shortage of materials, purely verbal explanations by teachers, and background noise at home are the main difficulties, while Hebebci et al. (2020) stress the lack of software and hardware, economic difficulties, and regional differences. Along similar lines, Capelle et al. (2021) state that although a digital gap exists, the gap in the actual and effective use of technology and learning devices proves just as or even more significant. If existing infrastructure does not allow for adequate connections, individual attention will suffer (Primdahl et al., 2021). Thus, despite the investment in technological equipment, the pandemic has shown that education systems around the world were not prepared for the provision of online or blended education (Starkey et al., 2021).

In India, Capelle (2021) find that radio and television were not used to their full potential as learning aids, possibly due to limited reception. Meanwhile, although the Netherlands has a well-financed education system and good broadband access, it was found that students made little to no progress in their learning during the home study period (Engzell et al., 2021). In Norway, there was a perception of less support and feedback within virtual education in comparison to that received in in-person classes (Mælan et al., 2021), while in Ireland research shows that the connection between student and teacher encourages participation in virtual classes, especially among students with educational disadvantages (Bray et al., 2021). For the Swiss case, the socioeconomic situation may be a cause of learning discrepancies among students (Tomasik, Helbling, & Moser, 2021). Meanwhile, in Japan, research points to insufficient evidence to justify the closure of schools as a means of curbing the spread of COVID-19 (Fukumoto, McClean, & Nakagawa, 2021).

In the United States the effects of the pandemic on rural populations have been very severe, especially in terms of unemployment, life satisfaction, mental health, and financial outlook (Mueller et al., 2021). Similarly, Gazmararian et al. (2021) report that students in semi-rural environments in Georgia expressed concerns over the results of their studies, and female and upper-grade students in particular present cases of stress, anxiety, depression, and loneliness. In China, rural adolescents in their final year of secondary school exhibited very high levels of depression and anxiety amid the uncertainty of the pandemic (Hou et al., 2020). This research indicates that those from disadvantaged socioeconomic groups as well as ethnic minorities have been disproportionately affected in various aspects of their lives (Gazmararian et al., 2021).

Scully et al. (2021) demonstrate that rural schools and those with underprivileged students have experienced the greatest challenges in relation to online teaching. For their part, Lai and Widmar (2020) point towards a negative correlation between rural living and internet connection speed. That is, rural broadband has been a recurring obstacle to learning under the virtual modality, despite the flexibility that it purports to provide (Muthuprasad et al., 2021). Another study, employing a survey administered to teachers, finds that directors from urban areas display better leadership than their counterparts in rural areas, even if students thought the reverse (Rashid et al., 2021). According to Lai and Widmar (2020), the cost of infrastructure and the viability of educational service provision are valid concerns that the authorities should take into account. Therefore, governments must strike the right balance between the use of online education, radio broadcasting, and

physical infrastructure to reach children in rural or remote areas (Avanesian, Mizunoya, & Amaro, 2021).

Overall, the evidence so far shows that the pandemic has posed serious challenges for education systems the world over, especially in countries where economic and social development is not equitable. This situation is worse in rural areas where, historically, there have been severe deficiencies in geographical access, infrastructure, and staffing, as well as financial, food-related, and health problems among students and teachers alike. Given this context, the present study seeks to answer the following question: What are the main challenges and opportunities associated with virtual education from the perspective of teachers at rural schools in Peru? To this end, we seek to elucidate the experiences of these teachers in the context of the confinement measures imposed due to COVID-19. As a hypothesis, and in light of the findings of the literature review, one might surmise that there were more challenges than opportunities in this developing country.

2. Methodology

Approach and research design

This research employs a qualitative approach and a phenomenological design (Hernández-Sampieri & Mendoza, 2018). This methodology was selected as a useful way to determine the perceptions and the experiences of our informants with regard to how the virtual education modality implemented in response to the COVID-19 pandemic affected rural areas of Peru. Moreover, because the qualitative research approach is not commonly employed in these rural areas, the research problem required the collection of non-numerical data. This proved a major advantage, allowing for the construction of an antecedent whose depth and novelty could be of great importance.

Participants

The participants were 23 teachers at public secondary schools located in remote and rural parts of the Peruvian central highlands. A convenience sampling method was used, taking into account the following selection criteria: (1) Teacher at a secondary school; (2) employed at a rural school in the central highlands in 2020 and 2021; and (3) participates voluntarily in the study. All participants are state-certified teachers on indefinite contracts and with more than five years of experience in the public sector. Each of the participants has received official training on Peru's National Curriculum for Basic Education (CNEB); 12 are trained in intercultural bilingual education; 14 use Quechua to communicate with and teach their students; and 8 teach

multiple grade levels (known in Peru as "*polidocencia*"). The average age was 34 (*DE*=1.46); 11 were men and 12, women. All were professionally trained at public universities, and 18 participants had children of their own.

Instrument

During the fieldwork, we carried out semi-structured interviews. To this end, we prepared an interview guide with open questions that corresponded to the following categories: (1) uncertainty at the start of the pandemic, (2) implementation of urgent measures, (3) educational reality, (4) educational policies and programs, and (5) effects on learning. We selected these categories after analyzing and reflecting on the problematic with the aid of the most salient results from the literature reviewed. The instrument was reviewed by three professionals—one social psychologist and two educators—who, after evaluating the operational and conceptual definition, classified it as highly acceptable. The final instrument implemented in the rural areas was composed of 18 questions about the teachers' perceptions and experiences of virtual education.

Procedure

After an initial meeting with the participants in which we explained the purpose of the research, we asked them to give their informed consent. During the interviews, we prioritized the confidential handling of the information collected. Initially, the intention was to carry out the interviews by video call. However, geographical location, limited access to internet connection, and lack of availability of the necessary devices (smartphone, laptop, or tablet) all precluded this approach. Therefore, we conducted the interviews by way of recorded telephone calls. These took place in the second half of 2021, and the average length was 37 minutes. Upon completion and transcription of the interviews, we organized the data based on the responses given then processed them using the ATLAS-ti v.9 software package. Finally, we color-coded the data to denote the grouping of the responses in each category.

3. Results

Category 1: Uncertainty at the start of the pandemic

In March 2020, Peru's school year was just beginning. The teachers we interviewed stated that they had already planned and prepared all their scheduling and activities as they welcomed the new school year. They had gone to great lengths to get their classrooms ready, and some had prepared

integration activities and small surprises or gifts to ease the return after more than two months of vacation. Some acted with targets in mind, such as the following teachers:

> P01: "I had just asked for tutoring for a fifth-grade secondary class to support them in the final year of their studies [...]."

> P09: "I had intended to better myself and improve on the work done the previous year [...]."

> P12: "In March I was already thinking about how to go about doing 'achievement day,' and we'd even planned a date to do it on [...]."

All the interviewees noted that when the national state of emergency was decreed, they felt stressed due to the uncertainty. Only three teachers said that, to begin with, they felt upbeat, seeing the situation as an extension of their vacations, only for this feeling to give way to concern over the prevailing lack of coordination:

> P04: "[…] I had no idea what the school year would be like […]."

> P07: "[…] the sickness [COVID-19] dragged on… it was strange […]."

> P16: "[…] it was all worry, fear, stress. You didn't know what was going to happen even though we're far from the cities […]."

> P19: "[…] I felt emotionally battered […]."

Moreover, the teachers said that the students felt abandoned, perhaps because they were used to in-person attendance. In their experience, the students felt disoriented because access to the technology was limited and because they were not familiar with it due to its limited use up to that point. Some teachers said that their students prioritized other activities at the start of the public health emergency:

> P05: "[…] instead of classes, the students ended up doing work in the fields like planting potatoes […]."

> P08: "[…] they didn't study, they devoted themselves to the animals, to planting crops to help with the family economy […]."

> P11: "[…] of 24 students, only three sent in their assignments, and that was stressful […]."

Category 2: Implementation of urgent measures

Despite their distance from the cities, the paralysis of the education system was felt at all levels. Once the schools had closed, nine teachers explained that they resorted to door-to-door checks to determine whether the adolescents had access to a cellphone or any other device with which they could connect to the internet. The teachers did this on their own initiative; out of commitment to their work, they invested long hours in ascertaining whether their students were able to receive classes virtually. Indeed, 12 teachers said they walked for more than 25 minutes at a time to locate their students. On the other hand, 11 of the interviewees stated that the school management met in person to organize and decide on the best way to respond rapidly to the new context, on the assumption that the confinement measures would not be in place for long.

> P07: The director met with us just once. We were all quite far apart. [...]. We spoke in a loud voice so that our colleagues could hear us […]."

> P15: "[…] we had to prepare worksheets by hand to take round to the students who didn't have cellphones […]."

Three interviewees recalled that they used the local radio station to broadcast information about the adaptation of educational activities. This medium was also employed to transmit teachers' cellphone numbers to students so they could communicate via WhatsApp. The community members fostered a spirit of solidarity, prompting siblings, aunts and uncles, cousins, or neighbors to spread the word if they knew of any teenagers who lacked the resources they needed for virtual study.

All were compelled to convert their printed or written material to the virtual format. Seven of the teachers said they were unprepared; they had not received training and their devices did not have the necessary software to give interactive classes in real time. Seven said that they only used their computers for drafting the documents or reports that the school required at the end of the school year, and had not explored any programs or applications beyond that.

> P02: "In truth, I was very under-prepared […]. I didn't know anything about computing either and my cousin, who knew a little more, helped me [...].

> P03: "In my case, I had the equipment, but for everyone it was a surprise, and it was a surprise for me too [...] it was tough to learn [...] I wasn't trained [...] we received no help [...]."

> P08: "[…]After a good deal of suffering, now I can get by in computing […]."

All interviewees said that amid the chaos and uncertainty they turned to WhatsApp, Facebook, certain Google tools, and the free version of Zoom to send materials, since these platforms were widely used and free of charge. However, 14 interviewees said that they were concerned that not all students had access to these virtual programs.

Category 3: Educational reality

The digital gap made its presence felt, directly affecting teachers and students. All participants agreed that their internet connections were inadequate, leading to problems downloading videos or animations on their laptops and sending them to students. Moreover, all the teachers remarked that there was a big difference between the technology available at urban schools compared with those in rural areas. Fifteen of the interviewees said that there was little or no internet reception in the villages where they worked, making it difficult or impossible to download images, videos and other materials.

> P06: "The ones [the schools] in the capital have money and are more advanced [...]."

As they noted, there are few internet connection points at their schools, and in some cases they can only be found in the administrative offices. There was also unanimity over the existence of a clear, deep, and lamentable digital gap; students did not have an internet connection at home and their parents, who in the vast majority of cases did not have a higher education, were unfamiliar with the technology and therefore unable to support their children academically.

> P13: "It's not like in the city; there you do get support, and both the young and old know it [...]."

Fourteen of the teachers thought that the situation worsened poverty in the most remote areas and hindered students' development, delaying or wrecking the few opportunities for self-betterment that existed.

However, nine of the teachers said that this "blow" had spurred them on to improve their use of technology, even though they felt powerless to do anything about the lack of internet access. All that remained was to

hope that their students could get reception, however limited, on some hilltop or other.

The teachers credit the pandemic with their having learned to identify and open a PDF file, open WhatsApp on a computer, use Google Forms for exams without spending any money, organize themselves better to give classes in less time and "save" internet, seek out quick ways of giving effective feedback, and explain class content much more patiently. But despite these achievements, they all agree that student participation dwindled markedly.

> P20: "Many students walked long distances to get to school but, with the pandemic, these students still walked but to find internet or radio reception on some hill in the village [...]."

Those families who could afford to do so bought computers—albeit ones that were barely adequate—to get through the virtual classes over the two years of confinement. All teachers felt that usage of technological equipment improved considerably over the period, but there was no escaping the fact that a large number of families were unable to buy devices.

> P18: "[…] the families in poverty and extreme poverty have not been able to buy telephones, and in the case of those who already had them, several siblings, cousins, or friends shared that same handset […]."

> P23: "[…] some parents sold their produce and animals to buy a telephone that will be of use for their children's classes, but the internet problem remained constant […]."

As noted earlier, the teachers complained repeatedly that the main problem—for them and their students—was internet access and quality, followed by the limited radio and television reception in elevated and remote areas. Twelve of those interviewees explained that the frequency of the public radio station was unstable, but that the station had helped them in certain places where there were receivers. Three participants noted that they were able to get better radio reception at night, but they were unable to take advantage of the broadcasts at that time. For this reason, class activities could not be carried out in their entirety; all the teachers mentioned that it was very difficult to distribute the materials if the students could not connect to the internet.

Category 4: Educational policies and programs

All the teachers thought that the educational measures implemented due to the public health emergency were not conceived with the poorest areas in mind; 17 of them thought them too extreme. Most confirmed that the authorities sent

out tablets but that there were not enough to go round, that neither students nor teachers knew how to use them, and that these devices remained stored away in the school director's office. Everyone agrees that the programs on the public radio station represented an excellent effort to disseminate educational content; however, not everyone was able to progress at the same pace given the lack of support, follow-up, and access to reception or textbooks.

All the teachers asserted that the local and regional authorities did not support implementation of the virtual system to any great degree. Thirteen interviewees said that local governments only gave them a few baskets of groceries, boxes of facemasks, and blank notebooks. On the other hand, ten participants confirmed that the help on offer was scant; at one point in the previous year a professional with computing expertise came to support them, but, unfortunately, he fell ill with COVID-19 four weeks later and did not return..

> P16: "[…] we have not received any support; they've left us in the lurch […]."

> P22: "[…] what's the point in giving out tablets if they don't teach us how to use them? […]."

With regard to the support received by the closest educational authorities, 15 participants said that they had received some talks at the start of the pandemic but these became increasingly less frequent as the weeks went on, to the point where there had not been a single one in the past six months. The teachers attributed this to an expectation that each person would "fend for themselves." Nonetheless, they all agreed that their school's director became a pillar of support. Despite the deficiencies of living in a rural environment, the directors ended up acting as de facto pedagogical advisors in every way they could.

Meanwhile, all participants confirmed that, given the difficulties, they decided to scale down the course content as well as relaxing demands regarding the submission of assignments. According to the testimonies, the situation merited this "reduction" of the curriculum to core topics in order to meet the minimum requirements and ensure students passed to the next grade without problems.

> P09: "[…] just half the fifth-grade secondary program was completed […]."

> P12: "[…] it wasn't possible to call for more. They didn't understand or couldn't connect […] so the most difficult topics were withdrawn."

> P14: "It was necessary to explain several times but, in the end, we settled on what was reasonable and necessary. We didn't go into depth in the subjects because it wasn't possible [...]."

Category 5: Effects on learning

When asked about students in the first three years of secondary, 14 teachers said that they had not developed the skills commensurate with their grade level—especially those related to research, problem solving, and writing. Twenty-two participants thought that an educational problem had arisen: although the students progressed to the next grade level, their learning and skills development were no better. In addition, 19 teachers expressed concern that the students' limited learning would bring negative consequences in future school years; students did not exhibit the necessary attainments to continue progressing through their schooling, and the resultant remedial program could take some years. All this took place in a context of equipment and internet connection shortfalls.

> P11: "Unfortunately, educational quality has fallen further with the pandemic […]."

> P17: "It could be that the students have problems in the coming years of secondary [...] some have not connected more than two or three times a year […]."

> P22: "[…] watching a video on WhatsApp is not the same as being in class; some lost any desire halfway through the year and did not reappear […]."

In relation to the students who graduated from the fifth grade of secondary school during those two years, all respondents were of the opinion that the students would experience major conceptual, procedural, and attitudinal difficulties if they decided to move on to higher education. Nineteen interviewees thought that the students who graduated from rural public schools were always at a disadvantage when they opted for university education, and in fact just two or three gained admission to higher education. Moreover, they thought that—be it during or after the pandemic—the differences become all the more pronounced when comparing young people from rural schools with their counterparts in the cities. Twenty teachers felt that the rural students had not enjoyed the same opportunities, and that the gap would grow wider still as a result of the public health and educational crises.

> P01: "All of them [the students] have had difficulties, but those from the cities at least had computers and internet […]."

> P04: "In many cases, there was no way of supporting them; the distance, the time, the accessibility, the pandemic [...] it seemed like everything went against us […]."

> P08: "Of all the courses, mathematics became a headache […]."

> P10: "The SIM cards distributed had just 10 gigabytes. Can anyone prepare for university with that?"

> P14: "They will suffer […] the ones [students] from Lima are better prepared […]."

As to the support students received from their families, all the teachers asserted that families in which at least one member had completed secondary or higher education were at an advantage over households without any formal qualifications. According to the testimonies, the teenagers with family support completed their assignments more quickly and connected frequently, and they were able to sustain their academic performance throughout the school year. For their part, seven interviewees noted that families with limited resources and formal education did not support their children's schooling, instead devoting their days to work in the field.

> P02: "The parents entrust their children's education to us without realizing that their support is also necessary [...]."

> P19: "The children of other teachers do complete the assignments, but families who are involved in sowing and harvesting do not support [their children's schooling] […]."

> P21: "Of all the parents at one grade level, I've only seen interest from three or four […]."

After the introduction of a blended modality, which began in rural areas in mid-2021, 15 teachers said that only five or six adolescents attended classes and watched videos of their teacher on their cellphones. Despite the initial lack of take-up of this measure, it was still greeted with optimism and cheer after a year and a half without on-site attendance. The teachers felt that the measure improved motivation, enthusiasm, and dedication; although these classes were held in open spaces, the fear of potential transmission of the virus was always present in the minds of the students attending. All participants explained that the students went to school to hand in their assignments. In some cases they sought assistance from the teachers, while in others their intention was to submit assignments from previous months. Those who did not attend experienced difficulties related to technology and

distance, which resulted in many students struggling to understand what they were studying. Another circumstance that most of the interviewees cited was equipment failures at the institutions.

> P13: "[…] some came, even if it was to hand in an assignment […]."

> P19: "[…] in the classroom there is more dialogue, we can explain better […]."

> P21: "[…] with the blended [model] there is more contact; it was a good start [that took place] three times per week […]."

When it came to the measures that, given their own experiences, the teachers would like to have seen implemented, they all stressed the local, regional, and national authorities' role in connecting their villages to the internet, improving the infrastructure available at their schools (construction, distribution, and connectivity), and training teachers in the new virtual teaching tools. Likewise, all the teachers insisted that in-person classes are vastly preferable to distance education because, in their view, younger adolescents are not yet mature enough to study or develop their skills under the latter modality.

> P06: "[…] the government needs to invest in infrastructure, so does the private sector […]."

> P10: "In my village there is just one mobile service provider [...] but it is very poor […]."

Four interviewees thought that teachers and students' digital skills are more valuable than learning mathematics or the arts. Meanwhile, everyone thought that the school closures in areas of low population density was excessive. On the other hand, six participants hoped that the return to the classroom would be planned, orderly, gradual, and, above all, that it would take into account the multiple realities of Peru's geography.

4. Discussion

As we saw in the results for the first category (Uncertainty at the start of the pandemic), at the start of 2020 all the teachers anticipated a relatively stable school year and had made all the preparations they thought necessary; but the declaration of emergency, with the consequent closure of schools, had a significant impact on their personal and professional lives. At first, teachers adopted different attitudes, habits, behaviors, and methods to discharge their classes, without knowing how long these momentous changes would

last (Code et al., 2020). At the same time, students experienced new forms of academic scheduling within the established calendar (Muthuprasad et al., 2021). These feelings of uncertainty reflected a state of insecurity in the face of the unknown, as nothing of the magnitude of the pandemic and its consequences had previously been experienced by anyone before. Yet, as Bray et al. (2021) propose, the process of reconsidering how teaching and learning were to take place turned out to be a positive aspect of this huge change, allowing improvements to be proposed over time albeit at huge social and economic cost.

According to the authorities, the closure of schools was a measure intended to save lives, especially among underprivileged low-income groups. However, given the results presented here, there is a need to assess the true cost of closing schools on public health grounds (Brooks et al., 2020) and, above all, to understand how confinement and other measures affect learning (Engzell et al., 2021). The total shutdown of on-site school activities has been called into question in different parts of the planet, as children have been found to be less susceptible to COVID-19 and less likely to spread the virus (Fukumoto et al., 2021). For example, Parolin and Lee (2021) find that transmission is more likely in cities with high population density, whereas in rural areas, where the population is scattered over a wider area, the risk is lower. And research has found that school closures in continental China, Hong Kong, and Singapore are only likely to have prevented the equivalent of between 2 and 4% of the total deaths (Viner et al., 2020). In the specific case of Japan, some research has pointed towards insufficient evidence in support of school closures as a measure to prevent COVID-19 transmission (Fukumoto et al., 2021).

The protection of public health was the primary motivation but, as Azevedo et al. (2021) note, it is very possible that groups suffering from exclusion and inequality, such as women, ethnic or racial minorities, and individuals with a disability, experience a widening of existing gaps due to the school closures. In accordance with their interviewees' responses, Bayrakdar and Guveli (2020) observe that students from marginalized households devote less time to schoolwork; thus, in the opinion of the authors, social origin is a factor to be taken into account when analyzing this problematic. According to Azevedo et al. (2021), the closure of schools causes a decline in learning quality equivalent to the loss of 1.1 years of schooling, making it all the more important for governments to reflect on the potential benefits of this measure and what can be done to offset the harm done to all students (Viner et al., 2021).

The sense of abandonment reported by the interviewees is a natural response to the uncertainty and lack of support that was likely repeated in

different climes, and for which, as Engzell et al. (2021) recall, no institution or government was prepared. This unprecedented crisis has had numerous impacts, including a decline in learning due to school closures and an economic crisis that affected parents (Azevedo et al., 2021). Everything would seem to suggest that, despite the efforts to mitigate the initial negative impact, the costs and other repercussions of school closures will be felt for several years (Parolin & Lee, 2021); these include lags in the learning of the most disadvantaged (Werfhorst, 2021) and the deepening of existing social inequities (Code et al., 2020; Dietrich et al., 2021).

As to the results of the second category (implementation of urgent measures), one glimpses the sacrifice that professors generally made at the start of the pandemic to establish contact with their students. The aim of these innovative strategies was to promote the adolescents' attendance and participation despite the unfavorable context (Bray et al., 2021). In so doing the teachers demonstrated flexibility as well as creative and transformational skills (Colville et al., 2021), despite their lack of preparation (Gudmundsdottir & Hathaway, 2020). This reality was also reported by Palmer et al. (2021) for the African case; teachers throughout the continent were aware that they were not trained or equipped to deal with virtual education, but still managed to get by due to their sense of responsibility towards their communities. Nonetheless, Tomasik (2021) explains that the mass provision of online education proved to be a valuable stand-in for face-to-face education amid the global emergency, but it is important to recall that not all students benefited to the same degree despite the best efforts of teaching staff.

In many cases, learning is based on the assumption that all students have the necessary equipment and understand the course content (Primdahl et al., 2021). However, the results of the present study depict a reality totally removed from that experienced in major cities. For various reasons (geographical, economic, etc.), the virtual context became a barrier to establishing affective bonds with the most vulnerable students (Primdahl et al., 2021), making it difficult to foster any sense of belonging, motivation, and enthusiasm among the adolescents. In the beginning, as noted here and in accordance with Mælan et al. (2021), the use of information and communication technologies (ICT) was very limited, but teachers used their ingenuity to make the most of the few tools they had at their disposal. They made use of village radio stations, walked relatively long distances to locate students and, despite the digital gap, did what they could with applications such as WhatsApp, Google Classroom, Zoom, and e-mail (the first of these platforms was among the most used around the world) (Ariyanti & Imán, 2020; Capelle et al., 2021).

From the international experience we know that ICT skills, access to technology, and the didactic development of learning activities are three aspects that shape how students perceive online education (Butnaru et al., 2021). Thus, in our view—and as Palmer et al. (2021) have proposed—teachers should have been empowered during this period of uncertainty through the provision of inclusive and transformative strategies and resources and through the development of their social-emotional skills. However, the data collected in the present study reveal a perception of abandonment and delayed reaction on the part of major educational authorities. This, alongside unequal access to social and cultural resources and to opportunities, (Bray et al., 2021), has had serious consequences for the development and advancement of the school population.

With the information collected in the third category (Educational reality), the digital and educational neglect of the country's rural areas is all the more apparent. This confirms that the students most adversely affected are those from underprivileged households, which, in turn, exacerbates inequalities among these adolescents (Engzell et al., 2021). All this provides evidence of the inverse relationship between rurality and connectivity (Lai & Widmar, 2020), indicating that the problem cannot be solved by giving away devices for virtual classes when there is no internet access. Given these deficiencies, the school dropout has increased at an unprecedented pace (Azevedo et al., 2021), partly because possessing a technological device (computer, tablet, etc.) does not guarantee access to a quality education.

Turning to Category 4 (educational policy and programs), it is evident, as Avanesian et al. (2021) propose, that government policies should be inclusive and designed based on access to technology that students can actually use and not just on the curricular content to be followed. To facilitate the transition to virtual education, the Peruvian Ministry of Education implemented the *Aprendo en Casa* program, which sought to provide various tools and resources through which teachers could assure learning experiences. However, to begin with, this initiative did not take into account the complexity of the situation, nor the limited access to information by the most remote communities. Many rural communities did not even have television or radio reception with which to take full advantage of the content broadcast by public stations.

Clearly, not all students had access and not all have been able to respond or adapt to virtual learning in the same way (Butnaru et al., 2021). As the results show (Hebebci et al., 2020), the lack of programs coupled with limited training and internet reception (Ariyanti & Imán, 2020) are an overarching theme that has had an impact on all the categories addressed

in this study. Thus, the only way to assure accessible, inclusive, and universal education is to guarantee that all students, regardless of their origin or location, have the same opportunities to study and learn (Avanesian et al., 2021). However, access to technology does not necessarily mean that it will be used to receive classes or that it will automatically improve the quality of learning; indeed, the gap in the actual, effective use of technology is very real, and must be taken into account in future research (Capelle et al., 2021). Moreover, it is important to note that no technology is capable of replacing on-site classroom interaction, replicating teachers' care and attention to students, or meeting the social-emotional needs associated with growth and development (Pozas et al., 2021).

Even though student commitment and perseverance are more important factors than time spent online (Hermann et al., 2021), negative opinions abounded regarding infrastructure and technology deficiencies, which will be difficult to overcome (Hebebci et al., 2020; Grewenig et al., 2021). For Bayrakdar and Guveli (2020), proper organization of synchronous and asynchronous activities, as well as the periodic review of school activities, are factors that can counteract the disadvantages of the distance modality. However, given a reality as complex as that studied here, the actions taken by teachers are not in themselves enough: broad-based and coordinated intervention alongside other educational agents is necessary.

It was found that the national and regional educational authorities were "remote," leaving school directors to play an important pedagogical and even emotional support role. Beyond the requirement that school management staff adhere to the rules put in place by the authorities (Novios & Childs, 2021), the directors, with all the limitations that exist in the rural context, appear to have become a cornerstone of good management, having participated in the design of school goals and targets, helping to reorganize study plans, and actively participating in the transition to virtual education (Rashid et al., 2021). Directors' understanding of the social impact of school closures, the changes implemented, and the routines adopted probably assisted teachers and contributed to their adaptation to the new context (Novios & Childs, 2021).

During the initial period of school closures, the concern with successfully beginning and ending the school year at the different grade levels was likely one of the major drivers of the swift migration to online education (Selvaraj et al., 2021). However, given the adverse context illustrated through the testimonies presented here, it was neither possible to sustain the same level of content nor to pursue a typical school year. Thus, the response of online education neither overwhelmed nor pressured schools

when it came to the provision of curricular content or the development of the necessary skills (Ariyanti & Imán, 2020). Although these measures made the continuation of the school year viable, their potential effects on the future of these young people are a matter for debate. In the final category (effects on learning), the interviewees expressed palpable concern over the learning lost over the two years of the pandemic. This result may be directly connected with all the difficulties experienced and with the truncation of the curriculum. Similar outcomes have been found in other countries, where different areas of learning have been affected. In particular, students have displayed some resistance to studying mathematics virtually (Amelia et al., 2020), and learning losses in this subject may be as high as 66% in comparison with past years (Sabates, Carter, & Stern, 2021). Indeed, Kuhfeld et al. (2020) suggest that reading and mathematics may be the two subject areas most impacted in terms of unattained learning targets.

The statistical simulation carried out by Azevedo et al. (2021) offers a gloomier outlook not far removed from the results of the present study. It analyzed data from more than 150 countries, calculating that school closures and learning losses may total up to $10 billion or, in the most pessimistic scenario, between $16 and $20 billion. The harm done to thousands of students worldwide, as quantified in this study, translated into an increase in social and economic inequalities. Engzell et al. (2021) explain that losses in learning were more significant for students from households with a lower level of education and in those countries where the infrastructure is inadequate or where schools were closed for longer. If the learning lags are to be reversed in the post-COVID-19 era, family and community environments must contribute to improving conditions (Sabates et al., 2021) in an articulated system in which the authorities are closer and are acquainted with the reality.

Indeed, recent research has gathered valuable information about the role of the family over the past two years when it comes to learning gains and losses in the rural environment. According to Mælan et al. (2021), home schooling widens the gaps between low- and high-achieving students; and indeed the differences in opportunities and connectivity elucidated by the testimonies presented here provide evidence of how the poorest are always those most adversely affected. In accordance with this finding, a study in Ireland revealed that the precarious conditions of the family environment compounded inequalities (Mohan et al., 2021) during the pandemic, while learning gaps increased in proportion to the lack of available resources or support at home (Sabates et al., 2021).

When "precarious conditions" are spoken of, this refers not only to the economic or material aspect but also to the education level of family members. According to the findings, students with family members who have completed secondary or higher education have a significant advantage over those from households whose members have had limited educational access. This is not restricted to Peru. Bol (2020) reported that in the Netherlands, parents' education level also appears to make a difference: those educated to the university level feel more capable of providing adequate educational support in comparison with those who are less educated. In this regard, Werfhorst (2021) explains that if parents are only educated to secondary level, students will be at a disadvantage compared to those whose parents have university degrees.

Just as we found from our interviews, Tsai et al. (2017) confirm that family socialization positively influences student learning and performance but that it also represents a great challenge for everyone. Other research makes similar observations; for example, in their study on German and Mexican parents, Pozas et al. (2021) found that organizing home learning and motivating their children proved a great challenge. Likewise, many parents assumed responsibility for guiding learning from home (Bol, 2020; Bayrakdar & Guveli, 2020), but this posed risks of stress, depression, sleep problems, and other effects on their mental health (Kim et al., 2021). These latter aspects have not been explored in depth in the present study, but it would be worth pursuing research that analyzes psychological and public health aspects during virtual education from the point of view of parents and the family.

Meanwhile, for our interviewees, the return to school gave rise to many doubts about the relevance of the measures taken and the promptness of their implementation. The advantages of remote learning are known to be enhanced within a blended model (Code et al., 2020); indeed, the combination of face-to-face and remote modalities is key to continuing and strengthening the learning of a greater number of students (Avanesian et al., 2021). The return to school cannot be an automatic process: the circumstances of each community, village, and city must be analyzed and, above all, this return must be characterized by an emphasis on physical distancing and hygiene (Fukumoto et al., 2021), while also making provisions for social-emotional issues to counteract the effects and threats of social isolation (Vaillancourt et al., 2021). Schools must become spaces where students want to spend time and where they can receive support according to their needs so as to mitigate the negative impact and disadvantages caused by COVID-19 (Mohan et al., 2021). In addition, competition and investment

in infrastructure should be encouraged as soon as possible through regulation and policy formulation (Lai & Widmar, 2020). Sustainable public–private partnerships with the energy and telecommunications sectors should also be promoted to connect the most remote and disconnected communities with electricity and internet (Avanesian et al., 2021).

5. Conclusions

As we have shown here, the education crisis that predates the pandemic has worsened, gaps have widened, and the future, when it comes to making up for lost time and learning, is far from certain. Although online education can have the same value as the in-person modality (Nguyen, 2015), there is still much to be done before Peru's urban and rural education system is in a position to provide this service. The country's geography appears to be a factor in the ineffective efforts that the authorities have made in recent years towards the mass provision of basic services and connectivity. And when poverty, extreme poverty, and dropout rates are also taken into account, it may be that the crisis will never be overcome.

The teachers interviewed spoke of their experiences, their emotions, their feelings, and their frustrations. They are direct witnesses to education during the pandemic, they have endured the ravages of neglect and, despite all the obstacles, they remain committed to their communities. The lack of equipment, connectivity, and training was not used as a pretext for abandoning their pedagogical endeavor: they kept going with the task in hand. While some of their attitudes, behaviors, or decisions over the two years of the pandemic may have been debatable, it is important to remember this: they are exercising their profession in places where no one else wants to be, with disadvantages that very few have experienced.

The findings of this study can help to reflect on a reality in desperate need of attention, which could come in the form of planning and executing national educational policies in order to gradually recover what has been lost. Historically, rural education receives less support than that in other areas. However, the human capital in these faraway villages has the potential to progress provided they receive the support they require. It is vital that we continue exploring this topic so rich in information but so little explored. In addition, it would be worth pursuing mixed research in order to gather the perceptions of other educational actors about virtual education and, in turn, to identify the failures and successes in the design and implementation of public policies at the national and regional level. Every effort should be made to improve this line of research, bearing in mind that education is a social, dynamic process that can be both formal and informal.

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