DIGITALEDUCATIONREVIEW

Teachers' situated knowledge: Addressing digital exclusion in rural contexts

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ABSTRACT

This study delves into the intricate challenges surrounding incorporating information and communication technologies (ICTs) in education, particularly in regions characterized by digital exclusion, such as rural areas. By recognizing the potential of ICTs to support and expand student learning opportunities, this research explores the necessity for effective implementation through tailored professional development aligned with teachers' contextual conditions and needs. In addressing these challenges, the study explores the concept of technological appropriation, underscoring the significance of individual and contextual elements in adapting ICTs to users' specific needs and environments. Through unstructured face-to-face interviews with 21 teachers immersed in a digitally vulnerable rural context, this research unveils insights into how educators appropriate technologies to enhance student learning. The findings of this study contribute to the development of educational practices tailored to rural contexts, focusing on providing a meaningful and effective learning experience for students. By shedding light on teachers' strategies for navigating the digital landscape in challenging environments, the research aims to inform policies and practices that bridge the technological gap, ultimately fostering equitable access and enhanced educational outcomes in rural settings.

KEYWORDS: Rurality; Technological appropriation; Qualitative methodologies; Chile.

1 INTRODUCTION

Policymakers, researchers, and teachers have shown interest in seeking ways of using information and communication technologies (ICTs) in schools as resources that have the potential to increase student learning opportunities (Hinostroza et al., 2016; Vásquez et al., 2017). However, several scholars claim that using digital technologies in teaching is multidimensional and complex, requiring professional development (PD) adjusted to the teachers' contextual conditions and needs (Livingstone, 2012; Bezemer & Kress, 2016; Selwyn et al., 2020). Thus, educational communities are critical agents, particularly in regions marked by technological inequality, such as rural areas (Cabero & Valencia, 2019; Trucco & Palma, 2020).

However, achieving adequate ICT access involves various critical elements as access to ICTs at school alone does not yield concrete results. Firstly, teachers significantly impact student performance and academic experiences. Their ability to understand the purpose and pedagogical meaning of ICT integration is critical to producing successful outcomes (Cabero & Valencia, 2019; Selwyn, 2022a; Williamson et al., 2020). Precarious teaching training and a lack of guidelines for principals further contribute to superficial involvement with ICT development (Claro et al., 2017), with insufficient time allocated for planning and collaboration (Cabello et al., 2019). Additionally, when teachers and principals engage in ICT work, the quality of tasks, especially in areas like search criteria, source selection, and content verification, can be inadequate, directly impacting teaching processes.

One avenue to approach this phenomenon is through the concept of technological appropriation, which has been understood as a space for individual action, wherein individuals adapt it to their needs, expectations, and abilities (Hutchby, 2001). According to this perspective, there is no room for normative use of ICTs as they may not offer the same possibilities for all users (Haddon, 2004), the importance of providing tools that enable the harnessing of their potential is acknowledged. Therefore, technological appropriation requires both individual and contextual elements (Berker et al., 2006). Furthermore, evidence has demonstrated the relevance of the sociocultural context in which technologies are embedded (School Research and Development Center, 2021; Meneses et al., 2012). In other words, it is only through a situated use—that is, adapted to the needs and the environment—that ICTs are integrated and make sense for the user (Haddon & Silverstone, 1996). From this point of departure, rurality can be considered an ecosystem with values, traditions, and expectations that are not deemed similar to urban ones and do not conform to normative needs.

1.1 The importance of appropriation of technologies and situated knowledge of ICTs

In the literature, the concept of rurality is tightly linked to a geographic gap limiting quality access to the Internet (LaRose et al., 2011). Empirical evidence consistently points to challenges such as poor access to infrastructure, signal quality, low socioeconomic status, and an abundance of manual jobs in rural populations (Roberts et al., 2016; Williams et al., 2016). These factors contribute to limited exposure and experience with complex technologies, hindering the acquisition of digital skills in rural settings (Skerratt, 2008). Intangible factors like social isolation and lack of digital confidence further compound the challenges, exacerbated by insufficient support and low internet use frequency (Robinson et al., 2021). Thus, the relevance of ICT for rural education is underscored by the application of the appropriation of technologies, which provides a theoretical perspective to explore

how rural settings influence the usage and perception of technologies.

Discussing digital gaps and degrees of inclusion is of great social relevance since, theoretically, digital skills and their dimensions and degrees of use have been identified as significant predictors of mobility and social standing (Helsper & Reisdorf, 2016; van Deursen et al., 2016). Therefore, digital inclusion can be understood as a multidimensional and complex process that incorporates the use of the Internet to promote social mobility (van Deursen, Helsper & Eynon, 2016). This encompasses technical aspects, such as device access, signal quality, digital skills, as well as social and cultural contexts shaping the experience (Helsper, 2021), and attitudes towards the internet—both as a support and content—leading to its adoption and types of use. These are determined by user motivations, needs, and geographical location, among other factors (Correa & Pavez, 2016). To address these multiple elements, the Social Construction of Technology provides a theoretical framework to address the nuances of technological appropriation. In this view, technology takes on meaning based on the observer's perspective and the context in which it is situated, highlighting user agency, understood as "meaningful action that includes reflection on experience, interpretation of the present, and consideration of future needs and aspirations" (Wessels, 2012, p. 1534). Thus, participants in the study are conceived as agents, and their social and cultural contexts shape their technological appropriation.

This theoretical stance aligns with a social constructivist view of the internet, defining it as a plethora of opportunities and options where users extract what makes sense to them, shaping it through a continual process (Miller & Slater, 2000). From this perspective, it can be argued that the internet is not the same for everyone; it is constructed daily based on its users' beliefs, expectations, and experiences, in line with the contexts in which it is embedded. Therefore, technological appropriation processes go beyond accessing technology (Berker et al., 2006). This theoretical foundation allows for arguments and inquiries into the socio-cultural context of users and how they appropriate technology, which is crucial to understanding their practices and how the internet, ultimately, becomes a part of their daily lives.

The literature has recognized the pivotal role of outreach programs, stakeholder consultations, and partnerships with local organizations in fostering successful ICT implementations. Among others, the significance of collective efforts by recognizing the relevance of incorporating creativity within local communities (Marshall & Taylor, 2005). Additionally, findings emphasize the value of contextual relevance and simplicity in ICT initiatives as sustainable information solutions should be meaningful to the community (Stillman et al., 2021). For instance, evidence has shown that ensuring community involvement from the beginning of the project and encouraging participation increases the chances of success as it involves community members in shaping the intervention and enhances monitoring processes (Brown & Mickelson, 2019).

1.2 The Chilean case: rurality as the Achilles' hills

Schools are pivotal in providing access and training in technologies, increasing opportunities for full participation in society (González-Betancor et al., 2021; Ibieta et al., 2017). They play a key role in bridging the technology gap, providing Internet connections and training in digital skills that partially compensate for structural inequalities (Patiño et al., 2018). Yet In Latin America, urban inhabitants have between 15 and 41 percentage points more opportunities to connect to the Internet than their rural counterparts, emphasizing the digital divide and the urgent need for targeted interventions to address the disparities in digital access and skills development in rural education (Galperín, 2016). Although Chile stands out as one of the region's countries with a solid history of connectivity initiatives and achievements, rurality remains an Achilles' heel. Household Internet connectivity reached 87.4% in Chile in 2017 (SUBTEL, 2019); it is increasingly concentrated in metropolitan areas, particularly in families in the top three income quintiles (SUBTEL, 2021). More specifically, while 76% of Chile's urban population has Internet access, this is true for only 46.6% of rural inhabitants (Martinez et al., 2021).

According to the country's socioeconomic distribution, the Chilean educational system's structure comprises one factor explaining the issues traced before. The nation has a highly economically stratified system, with public and rural schools at the bottom of access to Internet infrastructure and learning resources (Correa, Pavez & Contreras, 2018; Cárcamo-Vásquez & Méndez-Bustos, 2019). Since the 1990s, the state has been concerned with providing access and PD on ICT integration in k-12 institutions (Claro & Jara, 2020). However, some scholars caution that these initiatives have been isolated and have concentrated on developing teachers' technical skills outside their working organizations, overlooking more profound pedagogical implications of the use (Rodríguez et al., 2012). This background has created difficulties for them in effectively applying and adapting what they had learned in PD to their respective instructional contexts1 and may lead to understanding why ICT transformative2 uses, especially in quantitative, generalizable, and large-scale studies, have yet to be reported confidently (Claro et al., 2018; Ibieta et al., 2017; Salinas et al., 2016). For instance, a study of 828 Chilean teachers revealed that only one-third possessed the necessary competencies to guide students in a digital environment, highlighting a gap in fulfilling their role (Claro et al., 2018). However, evidence has consistently shown that a combination of factors increased rural communities and schools' vulnerability. These include more limited access to laptops, lack of teacher experience in ICTs, and implementation of technologies in the classroom (Gandolfi et al., 2021; Lopez-Sintas et al., 2020; Tewathia et al., 2020).

1 There are multiple perspectives and traditions for defining the notion of 'context'. For this study, 'context' relates to multiple elements implied in teachers' use of digital technologies. A 'context' may involve a specific learning experience between pupils and teachers and wider collaborative professional instances within the school boundaries. Context may also involve broader organizations, such as the family, national policymakers, the research community, and society (Selwyn, 2022, pp. 38-39).

2 By transformative uses, the authors of this study refer to those that promote active student participation as opposed to practices that keep the focus on the teacher and are primarily characterized by implementing content-delivery strategies (Ertmer & Ottenbreit-Leftwich, 2014; Hinostroza et al., 2016; Tallvid, 2016).

After the pandemic, the Estate developed working groups with experts in the area and community members of rural schools nationally. These instances have helped them to agree on the most pressing concerns, such as in the Gabriela Mistral Rural Education Strengthening Plan (Plan de Fortalecimiento de la Educación Rural Gabriela Mistral), to provide Internet connection for the first time to 1,888 rural schools (MINEDUC, 2023). Secondly, the program Let's Be Community (Seamos Comunidad) was established to train teachers in using digital tools and provide students with laptops (MINEDUC, 2022). Finally, the National Rural Education Policy (Política Nacional de Educación Rural) (MINEDUC, 2024) agreed on the need for curriculum adaptation to meet the reality of rural students.

2 METHODOLOGY

Exploring the dynamic role of technologies and their implications in the educational process and performance in rural contexts presents a methodological challenge. However, qualitative approaches, known for incorporating information from the environment, attitudes, and behaviors of individuals (Porter, 2000), provide tools for analyzing context-specific phenomena by focusing on the "how" rather than the "what" (Berger, 1998; Esterberg, 2002). Therefore, this study's primary form of narration is interpretative, utilizing case studies (Denzin & Lincoln, 2018). This approach enabled participants to engage in a conversational relationship, allowing them to speak and generate knowledge (Kvale & Brinkmann, 2009).

A significant advantage of this methodology is that it empowers participants, giving them a voice and contributing to a nuanced understanding. Participants provide details about the rationales behind their decisions, trajectories, and levels of engagement in the world of new technologies. Qualitative strategies facilitate an immersion into participants' daily lives with an inclusive approach, delving into the exploration of ICT in everyday life and its meanings and uses (Silverstone, 2005). Moreover, this approach offers additional advantages, such as allowing participants to report evidence from their immediate environment and expressing their attitudes toward technologies. Furthermore, it enables researchers to collect deep and detailed data, aiding in the recreation of the context in which participants make decisions.

The study encompassed 7 educational communities in central and south of Chile, and 21 teachers and school directors participated. The main criterion for selecting the schools was their vulnerability index, which measures the risk of its students, such as school dropout, poverty, and weight-for-age deficit, and incorporates a socioeconomic evaluation (Infante et al., 2013). The authors identified schools through the Education Ministry directory (MINEDUC, n.d.) and extended invitations to rural schools. Subsequently, school principals were contacted, employing a snowball approach to interview available teachers at each school, some of which had a single person handling both roles of principal and teacher. The participants were from schools scoring between 90% and 98% in the school vulnerability index and only provided primary education. Although the communities were diverse regarding their economic activities, they were mostly agriculture-driven, either as small agricultural owners or seasonal workers.

The topics covered in the interviews included (1) rural context and day-to-day life and activities; (2) access to technologies and the Internet (activities, requirements, experiences); (3) challenges encountered during the pandemic and sources of support; (4) practices that they identified as mitigating said challenges and the role of technology in them; (5) challenges when returning to face-to-face learning and changes perceived in the students.

Before the interviews, the Institutional Ethics Board of a university in Chile approved a hard copy of the informed consent (Number blinded for peer review), which the participants received. The researcher explicitly conveyed that the project was an academic endeavor, also providing assurances regarding anonymizing their names. All 21 participants willingly agreed to participate and formally signed the consent form before the interviews commenced. Furthermore, although the study aimed to hold them in person, mainly because of Internet access and connectivity disadvantages, we had to incorporate other technologies to complete the research plan, in which case the consent was previously sent by email and signed back.

All the interviews lasted for 35 to 65 minutes and were recorded and transcribed. The data was systematized using NVivo software. The primary analytical approach is deductive, top-down reflexive thematic analysis, following the model proposed by Braun and Clarke (2021). The process, adapted from Goulding (2003), comprises six steps: familiarizing with participants' narratives, generating codes, shaping themes, evaluating potential themes, defining, and labeling themes, and ultimately generating the final report. This method allowed us to look for patterns across participants and to compare their experiences. The main elements that guided the analysis were rurality, Internet access, devices, online educational experiences, offline educational experiences, digital skills, and teachers' and parents' roles in the learners' educational experience. Emergent themes appeared from the ongoing analysis, such as precarious technological conditions, teachers' emotions and tensions, children's return to so-called normality, and the changes experienced.

3 RESULTS

3.1 Organizing through WhatsApp to cope with uncertainty and priorities.

In rural settings, the school plays a central role in the village, fostering a tight community among teachers, parents, and students. Participants' predominant view is that, contrary to urban settings, their rural communities are safe so children grow up freely and in contact with nature. This is the key to what they refer to as a healthy educational environment, where they develop close ties with their students and families. As one teacher with 37 years of service describes, *"We, in rural schools, are teachers, principals, assistants, helpers, cleaners, moms, dads, everything."*

Consequently, when COVID-19 quarantines forced schools to close, the primary goal was maintaining communication between teachers and students. Setting this purpose allowed schools to map out families, address their basic needs, and coordinate food deliveries, which were provided by the Estate due to the students' vulnerability. This is consistent with the view of the school as a place with a relevant role in the well-being of students that goes beyond educational responsibility that emerged in interviews with all teachers and principals alike. For instance, the main worries were to assure their students access to food baskets and support them emotionally when they lose a family member, or a parent got out of a job. In this case, the Internet signal was still an issue, yet they were committed to further a community tie with the help of constant communication through WhatsApp groups. They relied on

WhatsApp because, as a technology, it was reported to be accessible to everyone despite limited connectivity and digital skills, and it was helpful to overcome challenges such as problematic Internet access and outdated equipment. Community members' widespread adoption of this technology resulted from its cost-free availability through various phone companies, enabling accessible communication via Wi-Fi.

Once teachers established food delivery logistics, they shifted focus to organizing schoolwork. They could hardly anticipate that students would not attend school in person for almost two academic years. The unpredictable situation and vulnerability forced the principals and teachers to strategize in different ways and levels as their regular educational obligations intersected with more critical ones. The key was maintaining contact between teachers and students so the schools could map out the families and their needs transitioning from basic to more sophisticated once the pandemic progressed.

Despite difficulties with quality Internet connection and dated equipment, instant messaging technology was widely adopted by community members because it is free to use through many phone companies. Hence, due to its popularity, chat groups gathering teachers and principals, teachers and parents, and students and teachers were created to safeguard educational continuity according to the conditions imposed by the pandemic. In this sense, the instant messaging system became the favorable ground for the community within the confines of the institutional context; it yielded common learning environments that adjusted to the needs and circumstances of the new scenario given by the sanitary crisis. WhatsApp brought together different contexts –that of the teachers, principals, pupils, and families- generating a new one through a virtual platform. For instance, the group call option was used for broadcast classes.

However, this practice presented two main problems. First, children had to cope with devices and internet access to study online. Some parents did not have a plan that allowed them or their children to connect for extended periods. Besides, students often accessed educational resources and videoconferences through their parents' mobile phones, who worked out from home during the daytime, precisely when online classes were held. This result coincides with reflections shared by other scholars on the need to define equitable access, how to provide it for students, and how families and parents can be supported at home so that children can study adequately using digital technologies (Williamson et al., 2020). Second, the participating teachers had to transform their homes into their workplaces. Their intimate living environments became their classroom settings. In addition, as reflected in the following quote, work schedules were extended when the use of instant messaging was expanded:

> *"All the teachers, all the staff, had to provide their personal phone numbers to receive or deliver information, and that also violates our family privacy because sometimes people did not respect the time or the day, and we had to respond whenever they called."* (Teacher, female, 63 years old)

This testimony reveals implications for multiple dimensions of teaching. One of them is related to professional development (PD). This concept refers to the opportunities that teachers have throughout their careers to learn professionally about different subjects. For this research, we refer specifically to integrating ICT in teaching. We may also refer to ICT integration in teaching from varied perspectives (Tessa et al., 2023), such as pedagogically (i.e., how using technologies to increase student learning achievement) and in administrative or organizational terms (e.g., ICT uses to enhance communication with pupils and family, among others). Porayska Pompsta et al. (2018) argue that 'flexibility' and 'adaptivity' are critical PD features. Therefore, in their view, PD opportunities should provide educators with reflective opportunities to support their understanding and practical application of professional learning in their instructional contexts. However, this practice imposed a significant burden on teachers, and as indicated by their testimonies, it had a direct impact on their mental health. Consequently, in two schools WhatsApp groups were deleted and prohibited after the return to regular classes. In these instances, only an online group for teachers and the principal continued to operate, but with explicit rules and objectives for use.

In other schools, eliminating this practice proved more challenging, and as a result, it persisted. Teachers, in turn, found ways to leverage it by sending voice messages to parents and students as reminders for homework, providing examples of outcomes, or even explaining concepts not fully understood in class. This extension of the classroom experience was unconventional and taxing for teachers but very well received by both parents and students.

A second finding pertains again to PD. The data reveals a gap between teachers' perceptions of their pupils' familiarity with technologies and their actual ICT competencies. While teachers recognized they had limited prior training on ICT, especially on online educational platforms, they declared that students could manipulate ICT intuitively, particularly mobile and online technologies. This finding intertwines with issues of quality technological access and infrastructure, as well as regulations and expectations from school leaders to teachers concerning the tasks they should accomplish through remote teaching during this period. As previous evidence has shown, the circumstances were unsuspicious, mainly because of teachers' limited prior training in ICT (Claro et al., 2017, 2018). As an example, a teacher recalls:

> "*We are not from the computer generation but have been learning. It is different for the children -you hand them a phone, and they know how to press buttons and the whole thing even before they learn to talk. We have had to learn how to use a computer. The most sophisticated thing we had when we were young was the scientific calculator*" (Teacher, male, 52 years old).

> *"There were people (teachers) who either didn't have (internet) or couldn't use it. Older teachers, too, were hesitant; they preferred doing anything to be present, to provide the guides, but not through the internet." (*Teacher, female, 63 years old*)*

However, a generational divide became more apparent during the pandemic and continued afterward. Take a 39-year-old teacher for the subjects of math, religion, and science, for example. He consistently participates in courses to update his lesson plan. During the pandemic, he began following rural teachers on TikTok, drawing inspiration from their ideas. This was particularly important because, after the pandemic, he found it impossible for his students to maintain attention for over 50 minutes or even remain seated. To address this, he decided to 'shake things up' in his classes by experimenting with digital tools, given that most of his students have a mobile device. Additionally, he introduced the Class Playlist on Friday evenings when students must stay to complete pending homework and guides. Each student selects a song, creating a playlist that serves as background music for the class. For Cristian, the sense of community he found with other teachers online on

TikTok has been a crucial factor in the return to face-to-face classes.

"The children returned unmotivated after the pandemic, and I believe that's where the search for new things comes from (...). Rural schools face the same realities. For example, the same child coming from the countryside often lacks (technological) access. We have to share computers with other teachers too, and if one uses applications, such as those with a barcode for displaying results, it changes the dynamics." (Teacher, male, 39 years old)

Access to the Internet and digital technologies is relevant for rural teachers and students because, as noted before, ICT is intrinsically complex, although inherent to people's daily lives to a greater or lesser extent. As sociocultural devices and resources, these are not neutral (Potter & McDougall, 2017; Selwyn, 2022), and schools, among other institutions and communities, are responsible for finding ways to harness these technologies to increase student learning. Hence, access is the first step to developing an agenda for teaching and learning with ICT. Subsequently, when access and infrastructural issues are resolved, policies can help communities generate a digital culture that increases pupils' learning.

3.2 The tensions of access and use of digital tools in the classroom

The challenges within rural education are increasingly apparent after the pandemic, as participants reflect on the tension encountered when returning to face-to-face teaching and adapting to what they describe as a new kind of learner: students are more impatient, restless, and bored with just pencil, paper, and blackboard. For instance, they share that they have no interest if technology is not involved, so they feel the pressure to integrate digital technologies into the classroom. In other words, the transition to remote teaching during the pandemic introduced additional layers of complexity within these communities as the idea of incorporating sort of fun practices through interactive and online activities became part of the day-to-day of teacher. However, despite well-intentioned efforts and in alignment with existing scholarly evidence (Videla et al., 2022), limited access to devices in students' and teachers' homes and inadequate internet connectivity emerged as pivotal factors influencing decision-making processes. Thus, teachers actively grapple with pedagogical decisions surrounding incorporating digital technologies into their teaching practices.

"Today's children are more scattered; their attention is divided among various focal points. I'm not sure if going to school is a priority for them. Teaching them is more challenging; capturing their attention is harder."

"The audiovisual material supports? what you are doing in the classroom, but it is not mandatory. No one will tell you to display a video if you choose not to use it. In other words, these are suggestions from the Ministry (of Education); they suggest the use of ICT."

Some authors have claimed that teaching online does not share the same implications, dynamics, logic, teaching strategies, and assessment methods as in face-to-face environments (Carrilo & Flores, 2020; Videla et al., 2022). Therefore, it was predictable that moving in-person to online teaching practices without modification would not achieve the desired academic outcomes. In this sense, providing conditions for teachers to use digital technologies and adjust them to their institutional context is critical. Although recognized in the literature (Hinostroza et al., 2016; Ibieta et al., 2017), PD opportunities and adequate infrastructure are necessary bases that still need to be perpetrated, especially in rural areas.

4 CONCLUSIONS

Findings indicate that despite challenges related to a reliable internet connection and outdated equipment, teachers appropriated instant messaging technology to maintain close ties within the educational community (i.e., among them and with the students and their families). Therefore, the importance of chat groups to ensure educational continuity amid the seclusion conditions. In this context, the instant messaging system became a preferred platform within the institutional framework, creating shared learning environments that adapted to the needs and circumstances dictated by the health crisis.

Secondly, a gap emerges between teachers' perceptions of their students' familiarity with technology and the actual ICT competencies demonstrated by the students. Despite acknowledging their limited prior training in ICT, especially on online educational platforms, teachers asserted that students exhibited an intuitive ability to manipulate digital technologies. This observation raises issues related to the quality of technological access and infrastructure, alongside regulations and expectations imposed by school leaders on teachers regarding their tasks during remote teaching. This finding is closely tied to the broader challenges associated with teachers' limited prior training on ICTs, as indicated by previous research (Claro et al., 2017, 2018). Challenges arose as participants encountered tensions when returning to face-to-face teaching and adapting to what they describe as a new kind of learner, as they found students more impatient, restless, and bored with traditional tools, creating pressure to integrate digital technologies into the classroom. Thus, they used technology intuitively, lacking clear school guidelines. Furthermore, they indicate mostly a reactive approach to this post-pandemic student demotivation and high attachment to their smartphone, suggesting a need for external and digital stimulation. This underscores the necessity for professional development programs tailored to rural areas to both systematize ICT use in teaching and address the specific challenges of rural education, emphasizing adaptability to students' technological habits and the need for external motivation. This outcome is consistent with other scholarly research (see, for instance, Mateus et al., 2022) and shows that, although there are many challenges in the pedagogical uses of ICT (Ávalos et al., 2022; Cortés Abarca, 2021; Mateus et al., 2022), teachers have relevant knowledge about their subjects and teaching contexts. One possible way forward is integrating this knowledge into the discussion about educational technology. Considering the teachers' backgrounds -what they offer- is relevant since it reunites ICT educational policies and teachers' local practices as spaces for consensus (Selwyn, 2022b).

The problem of Internet access and quality connectivity unveiled teachers' resilience. Both challenges for rural communities risked educational continuity. In this case, teachers and educational leaders made creative decisions, considering the resources and competencies with which they had been previously trained. Thus, the interviews showed that staff needed more training on using ICTs and that each community negotiated strategies, developed hybrid approaches, and adjusted models by implementing a trial-and-error process, revealing that resilience highly characterized these communities. This outcome leads us to reflect on the

complexity of teaching with technology, precisely, in this case, that delivered through online platforms. It requires the harmonious interaction of several factors, including access and technological infrastructure. However, as many researchers in the field have mentioned, the solution lies in more than just a technical perspective (Ibieta et al., 2017; Philipsen et al., 2019; Scherer et al., 2020). Teachers require a holistic preparation on what it means to participate in a digital world. This result, consistent with other studies (e.g., Hinostroza et al., 2016), expresses the need to rethink educational policies regarding PD in educational technology. In generic terms, relevant literature has emphasized that PD provided by public entities has concentrated on increasing access, improving technological infrastructure, and offering PD opportunities outside the institutional context of teachers (Sánchez et al., 2011). Moreover, the content of these initiatives has focused on technical rather than pedagogical dimensions of ICT use (Rodríguez et al., 2012). For some rural locations, this challenge is more evident since access has not been fully covered, as was the purpose of the public policy (Hepp, 1996; Claro & Jara, 2020); teachers residing in remote locations cannot attend PD opportunities on ICT for feasibility reasons, and the few who can only receive training on technical matters, with limited possibilities to adjust what they have learned into their instructional contexts.

This evidence emphasizes the relevance of policy advocacy in promoting equitable access to technology and digital literacy initiatives. Moreover, these align with the main agreements experts and working groups have previously pointed out (MINEDUC 2022, 2023, 2024). Based on both, three courses of action are recommended: firstly, improving schools connectivity, particularly in those that remain without exclusive Internet signal. Secondly, teacher training in digital tools should provide enough agency for them to adopt these instruments to their students' needs. Finally, curriculum adaptation should be implemented to reduce teachers' efforts and bridge the gap between urban and rural schools, relevant to rural students' realities and Internet access levels.

Despite its prevalence, research in rural educational communities in the global south remains scarce. Therefore, more research is needed, particularly regarding strategies developed by teachers to overcome the lack of access to devices and problematic connectivity. For instance, their reliance on mobile phones and instant messaging apps to communicate with students and parents, even after returning to face-to-face classes. Furthermore, to explore rural teachers' further approaches to overcome with resilience and creativity their internet connectivity challenges. Finally, further research should also look into this post-pandemic phenomenon reported by teachers, such as students' disengagement and strong reliance on smartphones, which has guided them to look for external and digital incentives to enhance motivation.

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EL CONEIXEMENT SITUAT DELS DOCENTS: ABORDANT L'EXCLUSIÓ DIGITAL EN CONTEXTOS RURALS

Aquest estudi aborda els complexos reptes relatius a la incorporació de les tecnologies de la informació i la comunicació (TIC) en l'educació, especialment en regions caracteritzades per l'exclusió digital com les àrees rurals. Reconeixent el potencial de les TIC per donar suport i ampliar les oportunitats d'aprenentatge dels estudiants, aquesta recerca explora la necessitat d'una implementació eficaç mitjançant el desenvolupament professional adaptat a les condicions i necessitats contextuales dels docents. En abordar aquests reptes, l'estudi explora el concepte d'apropiació tecnològica, subratllant la importància dels elements individuals i contextuales per adaptar les TIC a les necessitats i entorns específics dels usuaris. A través d'entrevistes no estructurades cara a cara amb 21 docents immersos en un context rural digitalment vulnerable, aquesta recerca desvetlla reflexions sobre com els educadors s'apropien de les tecnologies per millorar l'aprenentatge dels estudiants. Els resultats d'aquest estudi contribueixen al desenvolupament de pràctiques educatives adaptades als contextos rurals, centrant-se en proporcionar una experiència d'aprenentatge significativa i efectiva per als estudiants. En il·luminar les estratègies dels docents per navegar pel panorama digital en entorns desafiants, la recerca pretén informar polítiques i pràctiques que superin la bretxa tecnològica, fomentant en última instància l'accés equitatiu i la millora dels resultats educatius en entorns rurals.

PARAULES CLAU: Ruralitat; Apropiació tecnològica; Metodologies qualitatives; Xile

CONOCIMIENTO SITUADO DE LOS MAESTROS: ABORDANDO LA EXCLUSIÓN DIGITAL EN CONTEXTOS RURALES

Este estudio profundiza en los desafíos intrincados que rodean la incorporación de tecnologías de la información y comunicación (TIC) en la educación, especialmente en regiones caracterizadas por la exclusión digital, como las áreas rurales. Al reconocer el potencial de las TIC para respaldar y ampliar las oportunidades de aprendizaje de los estudiantes, esta investigación explora la necesidad de una implementación efectiva a través del desarrollo profesional adaptado a las condiciones y necesidades contextuales de los maestros. Al abordar estos desafíos, el estudio explora el concepto de apropiación tecnológica, subrayando la importancia de elementos individuales y contextuales en la adaptación de las TIC a las necesidades y entornos específicos de los usuarios. A través de entrevistas no estructuradas cara a cara con 21 maestros inmersos en un contexto rural digitalmente vulnerable, esta investigación revela percepciones sobre cómo los educadores incorporan tecnologías para mejorar el aprendizaje de los estudiantes. Los hallazgos de este estudio contribuyen al desarrollo de prácticas educativas adaptadas a contextos rurales, con un enfoque en proporcionar una experiencia de aprendizaje significativa y efectiva para los estudiantes. Al arrojar luz sobre las estrategias de los maestros para navegar el panorama digital en entornos desafiantes, la investigación tiene como objetivo informar políticas y prácticas que reduzcan la brecha tecnológica, fomentando en última instancia el acceso equitativo y resultados educativos mejorados en entornos rurales.

PALABRAS CLAVE: Ruralidad; Apropiación tecnológica; Metodologías cualitativas; Chile