Revista de Estudios y Experiencias en Educación

REXE

journal homepage: http://revistas.ucsc.cl/index.php/rexe

Non-cost proposal to reduce educational-technological inequity during confinement in Chile

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Recibido: 10 de diciembre 2020 - Revisado: 03 de febrero 2021 - Aceptado: 09 de marzo 2021

ABSTRACT

Introduction: In Chile, social inequity becomes a critical factor that prevents the successful implementation of an online curriculum due to the unbalanced distribution of technological resources. Even though during Covid-19 confinement there is a multichannel approach from the Ministry of Education to provide families with educational material, e-learning stands as the only available option for formal instruction. Objective: This study aimed to reduce educational-technological inequity during 2020 confinement in Chile through a non-cost feasible proposal. Material and Methods: The study was applied research under a mixed approach paradigm. In order to reach the main objective, two specific objectives were set: (1) To determine the contextual challenges related to technology that prevent online implementation of courses in Chile (2) To determine the popular technological resources in Chile that can be used for educational purposes. A checklist based on Aldowah's questionnaire, and an analytic matrix were used to accomplish these objectives. Conclusions: A feasible contribution to educational-technological equity during 2020 confinement in Chile seems to be to use Facebook® for collaborative learning, lectures, oral presentations, reading comprehension, written production, discussion, creative learning, and feedback, since it can support all these types of activities, in a free-internet-access mode, supported for multi-device, which increases the opportunities of participation of all Chilean students in online classes.

Keywords: Technological affordances; technological challenges; educational inequality; internet access; confinement.

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https://doi.org/10.21703/0718-5162.v21.n45.2022.004 *ISSN en línea 0718-5162*

Propuesta sin costo para reducir la inequidad educativo-tecnológica durante el confinamiento en Chile

RESUMEN

Introducción: En Chile, la inequidad social se convierte en un factor crítico que impide la implementación exitosa de un currículo en línea debido a la distribución desequilibrada de los recursos tecnológicos. Durante el confinamiento por pandemia de Covid-19, aunque existe un enfoque multicanal del Ministerio de Educación para proporcionar material educativo a las familias, el aprendizaje electrónico es la única opción disponible para la instrucción formal. Objetivo: El presente estudio tuvo como objetivo reducir la inequidad educativo-tecnológica durante el encierro 2020 en Chile a través de una propuesta gratuita y viable. Materiales y métodos: El estudio fue una investigación aplicada bajo un paradigma de enfoque mixto. Para llegar al objetivo principal, se establecieron dos objetivos específicos: 1) Determinar los desafíos contextuales relacionados con la tecnología que impiden la implementación de cursos en línea en Chile 2) Determinar los recursos tecnológicos populares en Chile que pueden ser utilizados con fines educativos. Para lograr los objetivos de esta investigación se utilizó una lista de verificación basada en el cuestionario de Aldowah y una matriz analítica. Conclusiones: Una contribución factible a la equidad educativo-tecnológica durante el confinamiento 2020 en Chile es el uso de Facebook® para el aprendizaje colaborativo, conferencias, presentaciones orales, actividades de comprensión de lectura, producción escrita, discusión, aprendizaje creativo y retroalimentación; esta plataforma puede sostener todos estos tipos de actividades, en una modalidad de acceso libre a Internet y soportada por multidispositivos, lo que aumenta las oportunidades de participación de todos los estudiantes chilenos en las clases en línea.

Palabras clave: Asequibilidad tecnológica; desafíos tecnológicos; desigualdad educativa; acceso a Internet; confinamiento.

1. Introduction

During 2020, the Chilean educational system struggled with the effects of Covid-19, which forced authorities and school communities to move from traditional in-classroom instruction to online settings to keep education going while complying with social distancing and quarantine policies (Ministerial de Educación de Chile, 2020; Technical Advisory Group of Experts on Educational Institutions and COVID-19, 2020). However, different Ministerial initiatives for implementing online courses were signed as insufficient since they lack the necessary insight to approach e-learning in a society intensely conflicted by inequity (Murillo & Duk, 2016; Quiroz Reyes, 2020). For instance, nine out of ten Chilean families pay for internet connection and, therefore, can access online education, leaving about 12.6% of families segregated from this newly adapted instruction (Cortés et al., 2020; Subsecretaría de Telecomunicaciones de Chile, 2017). For this reason, in order to achieve curricular objectives in online settings, Chilean authorities must urgently come up with effective strategies to mitigate the impact of social inequality.

Chilean Educational authorities are constitutionally responsible for funding, promoting, enhancing, and ensuring access to education to all learners from five to 21 years old (Ley 19876, 2003; Ley 20370, 2009). Moreover, the Chilean Ministry of Education (MINEDUC) must manage nationwide formal instruction, recognizing more than 16,237 institutions (Ministerio de Educación de Chile, 2019). All these schools are mandatorily subjected to the National Curriculum and National Study Plans and Programs; all recognized institutions must obey fundamental objectives and minimal mandatory contents established by the MINEDUC (Ministerio de Educación de Chile, 2009), and only about 5% of them are authorized to use programs of their own creation (Ministerio de Educación de Chile, 2019). Therefore, at least 3,442,688 students are currently enrolled in Chilean schools, thus subjected to Ministerial Study Plans designed for in-classroom formal instruction, which until 2020 had to be taught in online settings (Ministerio de Educación de Chile, 2020).

Consequently, about 95% of Chilean students face the consequences of the radical transformation of their instructional processes in a country that, in the middle of a sanitary, social and economic crisis imposed by Covid-19, struggles with high rates of inequity (Comisión Económica para Latinoamérica y el Caribe, 2020). Social inequity can dramatically impact online education due to socio-cultural and technological challenges that extend from professional readiness to computer self-efficacy and lack of access to hardware resources or internet bandwidth (Aldowah, Al-Samarraie & Ghazal, 2019; Bravo & Castillo, 2020; Lloyd, 2020). For instance, given the economy's impact of having 8.5 million people locked down due to quarantine at the peak of the outbreak (Ministerio de Salud de Chile, 2020) and the highest decade's unemployment rate (12.2%) with a total loss of 1.9 million jobs in 2020 (Bravo & Castillo, 2020; Instituto Nacional de Estadísticas Chile, 2020), Chilean families may have been restrained from accessing the available paid internet connection services (Bravo & Castillo, 2020; Subsecretaría de Telecomunicaciones de Chile, 2020) and necessary technological resources for their children to access online education (Aldowah et al., 2019; Bravo & Castillo, 2020; Lloyd, 2020). By March 2021, 24 different Chilean cities were kept under quarantine (Gobierno de Chile, 2021). Therefore, the successful implementation of an online curriculum within national frontiers is unlikely to be achieved due to the necessary resources' uneven disposal (Ministerio de Educación de Chile, 2020).

As a result, social inequity becomes a critical factor that prevents the successful implementation of an online curriculum due to the unbalanced distribution of technological resources (Quiroz Reyes, 2020). As a further pandemic counter-effect, inequity is expected to increase as Covid-19 remains active (Comisión Económica para Latinoamérica y el Caribe, 2020). Besides, by 2020 e-learning stood as the only available option for formal instruction (Ministerio de Educación de Chile, 2020), which directly conflicted with the inequity of resources and technological accessibility of learners (Bravo & Castillo, 2020; Murillo & Duk, 2016). For instance, according to experts, 13.7% of Chilean families were not accounting for the necessary funds to access internet connection and access online education by the end of 2020 (Comisión Económica para Latinoamérica y el Caribe, 2020). Consequently, it is critical to present educational initiatives to promote equal access to online education during confinement in Chile.

2. Methods and Materials

2.1 Research design

This study was applied research developed under a quantitative and qualitative approach. The study aimed to present a non-cost feasible proposal to reduce educational-technological inequity during 2020 confinement in Chile. In order to reach the main objective, two specific objectives were set: (1) To determine the contextual challenges related to technology that prevent online implementation of courses in Chile and (2) To determine the popular technological resources in Chile that can be used for educational purposes. To accomplish the objectives of this investigation, a checklist and an analytic matrix were used to determine the technological resources that could be used for educational purposes (Cambridge Dictionary, 2020; Chan, 2020; Crook & Schofield, 2017; GCF Learn Free, 2020; Kendeou, Papadopoulos & Spanoudis, 2015; Paterson, Paterson, Jackson & Work, 2020; Petersen, McMahon, McFarlane, Gillen & Itagaki, 2020; Scager, Boonstra, Peeters, Vulperhost & Wiegant, 2016; Steckelberg, 2015; Webwise, 2020b; Živković, 2014). This study took place between April and July 2020.

2.2 Instruments and procedure

To determine the contextual challenges related to technology that affect the online implementation of courses in Chile, Chilean student's internet access was analyzed through the questionnaire of Aldowah et al. based on expert judgment and bibliography (Aldowah et al., 2019). This instrument was divided into two sections: demographic characteristics and the different types of challenges present in online learning (individual challenges, course challenges, contextual challenges, and technological challenges). This second section was used for the checklist. The individual challenges consisted of the instructor's technological confidence, the instructor's motivation and commitment, the instructor's competence, and the instructor's time. The course challenges were divided into two groups: course design (curriculum, pedagogical model, subject content, teaching and learning activities, localization of content and flexibility), and type of support provided (support for students from instructors and support for instructors from schools). The contextual challenges were divided into two groups: organizational (knowledge management, funding received, training of teachers and staff) and societal/cultural (Role of instructors and students, attitude on e-learning and IT, school roles, and regulation). The technological challenges consisted of access, cost, and software and interface design. The items of the Aldowah questionnaire were used as a checklist to classify the internet challenges present in the Chilean context into the corresponding category.

To determine the technological resources which are popular in Chile and that can be used for educational purposes, a study of Pickaso 2020 was considered; this study analyzed the use of different applications downloaded during March and April 2020, which was the start of confinement in Chile (Panier, 2020). Simultaneously, the authors scoped these applications and the various internet providers in Chile to determine Chilean people's less expensive platforms. According to the features of students' accessibility, the information collected from the bibliography was poured into a matrix to identify the applications to use in the next step visually. Finally, the most popular and costless applications were evaluated to be used as educative support, contrasting them with eight criteria that corresponded to categories of activities in the teaching-learning process.

After the mentioned quantitative analysis, to propose a feasible contribution to educational-technological equity during confinement 2020 in Chile, it is suggested to use the most

popular and costless applications for educational purposes that suit better educational activities according to previous research (Cambridge Dictionary, 2020; Chan, 2020; Crook & Schofield, 2017; Kendeou et al., 2015; Paterson et al., 2020; Petersen et al., 2020; Scager et al., 2016; Steckelberg, 2015; Živković, 2014).

3. Results

The challenges associated with the internet barrier in Chile were categorized into three sections: (i) Individual Challenges (Motivations and commitment; Time), (ii) Course Challenges (Localization of the content), and (iii) Technological Challenges (Access; Cost) (Table 1).

Table 1

Checklist of Challenges in E-Learning in Chilean Education, 2020.

Categories	Subcategories	Check
Individual Challenges	Technological confidence	
	Motivation and commitment	X
	Competence	
	Time	
Course Challenges	Curriculum	
	Pedagogical Model	
	Subject Content	
	Teaching and learning activities	
	Localization of content	X
	Flexibility	
	Support for students from instructors	
	Support for instructors from School	
Contextual Challenges	Knowledge management	
	Funding received	
	Training of teachers and staff	
	Role of instructors and students	
	Attitude on e-learning and IT	
	School roles and regulation	
Technological challenges	Access	X
	Cost	X
	Software and interface design	

Own elaboration based on qualitative analysis.

According to the Pickaso group, the ten most downloaded applications between March and April 2020 (which was the start of confinement in Chile) were Zoom Cloud Meetings®, Vivo.com®, Facebook®, Tik-Tok Make Your Day®, WhatsApp Messenger®, Theme Store®, Instagram®, Messenger-Text and Video Chat for Free®, PicSay - Photo Editor® and Netflix® (Panier, 2020).

As shown in Table 2, Vivo.com®, Theme Store®, and PicSay - Photo Editor® are software that do not allow users to socialize or share data (Google Play, 2020b, 2020a; PicSay, 2020). This software group was in the top ten most popular in the country, however, they were discarded for educational purposes. Later, considering that a significant part of the Chilean population is under-connected, Zoom Cloud Meetings®, Tik-Tok Make Your Day®, Messenger - Text and Video Chat for Free®, Instagram®, and Netflix® were considered less popular since these applications use paid data, and 56.6% of Chilean users only access limited internet plans or data packages (Influencer Marketing Hub, 2020; Netflix, 2020; Subsecretaría de Telecomunicaciones de Chile, 2017; Webwise, 2020c, 2020a; Zoom, 2020). On the other hand, Facebook® and WhatsApp Messenger® were considered more popular due to the permanent free access that telecommunication companies offer in Chile, which consists of blocked internet access that excludes some social networks (Claro Chile, 2020; Entel, 2018; Movistar Chile, 2020; Subsecretaría de Telecomunicaciones de Chile, 2014; WOM, 2020).

Table 2

Cost and interface of popular software to socializing and sharing data.

	Device			Cost	
Popular Software	Requires a Computer	Requires a Mobile Device	Multidevice	Paid Internet	Free Access
Zoom Cloud Meetings®			x	x	
Facebook®			x		x
Tik-Tok Make Your Day®			x	x	
WhatsApp Messenger®			x		x
Instagram®		x			x
Messenger -Text and Video Chat for Free®			x	x	
Netflix®			x	x	

Own elaboration based on data collected from telecommunication companies and software companies (Claro Chile, 2020; Entel, 2018; GCF Learn Free, 2020; Influencer Marketing Hub, 2020; Movistar Chile, 2020; Netflix, 2020; Panier, 2020; Webwise, 2020c, 2020a, 2020b; WOM, 2020; Zoom, 2020).

The technological resources in Chile that combine popularity and free internet access in all telecommunication companies and are designed for multi-devices are Facebook® and WhatsApp Messenger®. However, Facebook is the only free internet access platform that suits all categories of educational activities (Table 3).

Table 3

Types of activities v/s free-internet-access multi-device applications in Chile.

	Facebook	WhatsApp
Collaborative Learning	X	
Lectures	X	X
Oral Presentations	X	
Reading Comprehension	X	
Written production	X	
Discussion	X	X
Creative learning	X	
Feedback	X	X

Own elaboration based on qualitative analysis (Cambridge Dictionary, 2020; Chan, 2020; Crook & Schofield, 2017; Kendeou et al., 2015; Paterson et al., 2020; Petersen et al., 2020; Scager et al., 2016; Steckelberg, 2015; Webwise, 2020c, 2020b; Živković, 2014).

4. Discussion

Regarding the general objective, which deals with presenting a non-cost feasible proposal to reduce educational-technological inequity during confinement 2020 in Chile, it was necessary to analyze challenges in online education in the country and software suitability to educational activities. Therefore, this section is divided into those two topics.

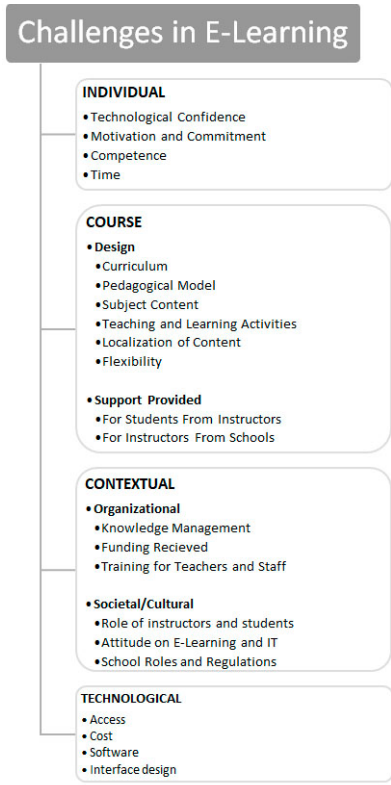
4.1 Challenges in online education in Chile

Van Dijk defines physical-digital access as obtaining the hardware and software of digital media and a connection to the Internet (van Dijk, 2017).

On the other hand, the OECD defines internet access as the percentage of households who reported access to the Internet (Organization for Economic Cooperation and Development, 2020). Related to this topic, Aldowah et al. categorized the different online education challenges into four main categories: individual, course, contextual, and technological (Figure 1) (Aldowah et al., 2019).

Figure 1

Own elaboration based on Aldowah et al. (2019).



In Chile, the internet quality depends on the family's incomes; even though most people have a connection to the Internet, good-quality services cannot be afforded by everyone (Subsecretaría de Telecomunicaciones de Chile, 2017). Considering inequity in Internet access in the Chilean population, we could classify it as an “Individual Challenge" (if we scope it from both criteria "Motivation and commitment" and "Time") (Table 1). These criteria come from the fact that a poor internet connection can undoubtedly affect motivation and increase the time initially assigned for a task (Lindsay & Mclaren, 2000). The inequity in internet access could also be seen as a "Course Challenge” if we scope it from the criteria "Localization of content." Suppose the course content is located in a platform that needs an internet connection (which is paid privately by users); in that case, students are paying to access the course content. This fact can also be constrained by popular trends of accessing the Internet through limited plans or mobile services packages that do not provide 4G connections (17.2% of users) (Subsecretaría de Telecomunicaciones de Chile, 2017; Claro Chile, 2020; Entel, 2018; Movistar Chile, 2020; WOM, 2020). Despite government initiatives to provide computers and internet connection for 7th graders nationwide through the program 'Me conecto para aprender,' Chilean public education does not offer a public internet connection for all learners (Ministerio de Educación de Chile, 2018). As a result, reaching every student may become a significant challenge, even more, when Chilean teachers lack the necessary digital competence for developing strategies to reach students despite internet limitations. The third category dealing with the internet challenge is the Technological area, regarding cost and access. As mentioned before, internet access is not public in Chile, so online access

to educational material has a price that families assume; if families cannot pay for it, then it is not accessible for everyone. From this perspective, it is essential to clarify that, in 2020, social media connection is entirely free for Chileans who own a smartphone, and they only pay for internet access when using other types of applications (Claro Chile, 2020; Entel, 2018; Movistar Chile, 2020; WOM, 2020). If the course content was located on platforms with free internet access (no internet payment needed), most students could access it.

Even though the internet connection is not public, Chileans are mainly functional and hyper-connected users, meaning that they use it on a daily basis for communication, working, and studying (Bravo & Castillo, 2020); in fact, the OECD refers that 87.5 Chilean households have internet access, that families pay on their own, which is the most excellent internet coverage of the continent (Organization for Economic Cooperation and Development, 2020). Cabello et al. refer that Chilean children access the Internet, mainly from multi-device and cellphone varieties (Cabello, Claro, Rojas & Trucco, 2020). Even though Chilean families have turned the Internet into an essential service, according to the OECD Broadband statistics, Chile has one of the six lowest internet speeds with 9.3 megabits per second; in contrast, the average speed is 15.25 megabits per second (Organization for Economic Organization and Development, 2020). Logically, low internet speed increases time investment in online activities, such as education in the confinement context. Teachers have referred that they spend more time preparing for online classes than for face-to-face classes; this extra time is related to adapting to software, adapting methodologies, recording and editing videos, answering e-mails, and others (Baran, Correia & Thompson, 2013). On the other hand, both teachers and students are affected by low internet speed and intermittent internet failure (Aldowah et al., 2019).

Besides the internet issue, there is evidence that families do not have enough computers at home for every member to use them simultaneously; Chile presents 33% of access to a computer per family (Balboni, Rovira & Vergara, 2011) since the average number of computers at home is 1.8 (Villanueva, 2020). Only 38.4% of Chilean students own a computer at home to work individually (Bravo & Castillo, 2020). Taking turns to use a device reduces individuals' available time to dedicate to work (teachers) or study (students) for more than 50% of Chilean learners (Bravo & Castillo, 2020). Under these circumstances, time management can be challenging, which, combined with the quarantine's pedagogical and psychosocial effects, may lead to a lack of motivation (Qiu et al., 2020). Recent studies refer that schools' closure in Chile during quarantine affects not only psychological and social dimensions but also the learning process; they also encourage the government to provide meaningful social interaction opportunities to socialize and strengthen relationships in the scholar community (Yeomans Cabrera & Silva Fuentes, 2020).

Unfortunately, everyone cannot have these opportunities since they are directly connected to internet access, which quality depends on the families' economics. Consequently, a percentage of the Chilean population can only access a small proportion of the Internet. Thus, social media has turned into the primary informative and communication means due to the free internet access companies provide by law (Subsecretaría de Telecomunicaciones de Chile, 2014). Furthermore, a related study indicates that access to the Internet should not be assessed with yes or no questions about quality and connectivity consistency since these factors significantly influence what access can offer; it also indicates that most families are under-connected in ways such as slow Internet, device sharing, nonpayment disconnection, mobile-only access, and hitting data limits; these situations are indeed connected to lower-income families (Katz, 2017). Similarly, Napoli and Obar refer that a significant proportion of the online population is "mobile-only." This group of people, which in Chile reaches 95.1% of users in urban and rural areas (Subsecretaría de Telecomunicaciones de Chile, 2017), is being

termed the "Internet Underclass" due to the disparities in the use of the Internet through a mobile contrasted to with personal computer use (lower levels of functionality and content availability) (Napoli & Obar, 2014). Due to all these facts, we can conclude that all contextual challenges that affect the implementation of Chilean online courses are related to either disconnection or under-connection.

Regarding the first specific objective (to determine the contextual challenges related to technology that affect the online implementation of courses in Chile), we conclude that these challenges are (i) Individual Challenges (Motivation and commitment; Time), (ii) Course Challenges (Localization of the content), and (iii) Technological Challenges (Access; Cost).

4.2 Software suitability to educational activities

The second specific objective of this research was to determine the technological resources that are popular in Chile that can be used for educational purposes (Panier, 2020; Google Play, 2020b, 2020a; PicSay, 2020; Influencer Marketing Hub, 2020; Netflix, 2020; Subsecretaría de Telecomunicaciones de Chile, 2017; Webwise, 2020c, 2020a; Zoom, 2020; Claro Chile, 2020; Entel, 2018; Movistar Chile, 2020; Subsecretaría de Telecomunicaciones de Chile, 2014; WOM, 2020).

As mentioned before, in Chile, Facebook® and Whatsapp Messenger® are popular social media and have free access to all telecommunication companies. When assessing their usage for educational purposes, eight criteria were included: Collaborative Learning, Lectures, Oral Presentations, Reading Comprehension, Written Production, Discussion, Creative Learning, and Feedback; these summarize the different categories of teaching-learning activities in classrooms. 1. Collaborative Learning consists of small group activities in which students participate sharing knowledge and expertise, while the teacher has the facilitator's role (Scager et al., 2016). 2. A Lecture is a formal talk on a serious subject given to a group of people, especially students (Cambridge Dictionary, 2020); regarding video lectures, we find five categories that depend on the format and design of the presentation: a) No presence of the teacher, but voice and writing are active, b) Presence of the teacher in the corner of the presentation, c) Presence in half-screen, d) Presence in full screen or whiteboard and e) Interview or talk (more than one person) (Crook & Schofield, 2017). 3. Oral presentations consist of presenting a specific topic to an audience; some advantages concerning oral presentations are greater class interaction and participation, increased interest in learning, gaining new perspectives, improvement in communication, and presentation skills, among others (Živković, 2014). 4. Reading comprehension involves identifying the meaning or message of the text at hand, and it is essential for socializing (Kendeou et al., 2015). 5. Written production is related to well-structured writing, a procedural tool to perform better in assessments and improve learning directly (Petersen et al., 2020). 6. Discussion of different classroom topics can promote positive learning experiences and cognitive development (Chan, 2020). 7. Creative Learning consists of using opportunities to develop tasks or solve problems through student preparation, student response generation, response validation from the teacher, teacher-student communication, and outcome evaluation; besides, cognitive, motivational, and emotional resources are provided by the teacher during the process (Paterson et al., 2020; Steckelberg, 2015) 8. Feedback is fundamental for an accurate teaching-learning process; recent studies reveal that students value evidence-based feedback in their daily practice and multimodality feedback, which is personalized, to enable students to improve (Paterson et al., 2020). Concerning the popular free-access platforms that are multi-device (Facebook® and Whatsapp Messenger®), the one that could support all the categories of activities in the teaching-learning process in an organized manner is Facebook®.

Constructivist pedagogy, which emphasizes the importance of context in meaning and understanding, and learner's construction of knowledge through social collaboration and interaction (Stacey, 2002), has obtained international recognition during the last decades (Richardson, 2003), even positioning as a significantly influential model for teaching practice in global communities (English, 1999). In the model of Constructivist Learning Environments, learners use social support to effectively learn and develop needed skills to enable collaboration and social construction of knowledge employing technology (Jonassen, 1999). As an illustration, these environments engage students in a constructive, intentional, complex, authentic, reflective, and cooperative web-based activity to enhance learning through social interactions. Nonetheless, these activities demand specialized training of teachers and students alike to manage contextual factors and allow socialization effectively (Elmer, Mepham & Stadtfeld, 2020). Locally, Chile is aligned with international standards and sets constructivism in the roots of its Curricular Basis. The National Curriculum emphasizes the importance of promoting didactic procedures enhancing inquiry and creativity for students to achieve collaboratively; besides, it is recommended for teachers to design activities involving analysis, interpretation, and synthesis of information collected from different sources, problem-solving activities, systematic comprehension of processes and phenomena, communication of ideas, and opinions and feelings by a coherent argumentation; all of them aimed to be achieved by meaningful social interactions (Ministerio de Educación, 2012, 2016, 2020). Therefore, ensuring social constructions and meaningful relationships is essential for learning and curricular achievement under current international and national standards also necessary to be addressed even in virtual settings, such as those imposed by COVID 19 (Elmer et al., 2020).

On the other hand, using recorded lectures is a solid ongoing trend. Many educational institutions have implemented them in courses (Bos, Groeneveld, van Bruggen & Brand-Gruwel, 2016) with wildly successful asynchronous online courses (Choe et al., 2019). These activities are feasible and successful when recorded lectures are engaging and student-centered (Choe et al., 2019) while also aligned with assessed contents and learning objectives (Bos et al., 2016). For instance, online learners prefer asynchronous activities in which carefully developed or selected lectures provide them with effective and meaningful learning experiences for engagement and connection (Choe et al., 2019). Consequently, adequately designed courses can use recorded academic lectures to improve students' academic achievement (Bos et al., 2016). As for the length of these lectures, they may depend on the learning objective associated with them (Bos et al., 2016). Actually, the critical influence of time spent on a task on academic achievement (Slavin, 2015) makes it crucial for teachers to carefully select content and length of lectures to align them with class objectives to avoid further impact on students' academic performance. For instance, teachers can design lessons to include only an extract for reference or the complete lecture track as the main content delivery source (Bos et al., 2016). Consequently, recorded lectures, webcasts (video or audio broadcast via the Internet), or podcasts (audio only) (Traphagan, Kucsera & Kishi, 2010) can be beneficial for group or individual activities (Traphagan et al., 2010). They may serve as a supplement or substitution mechanism to deliver content while, at the same time, they can directly impact academic achievement if not properly selected and associated with learning objectives (Bos et al., 2016). Finally, the use of recorded lectures, webcasts, or podcasts can effectively replace in-classroom lectures (Bos et al., 2016; Traphagan et al., 2010) and enhance students' autonomous learning (Warschauer & Liaw, 2011), key for curricular and academic achievement in online instruction (Baran et al., 2013).

Most learners consider podcasts, webcasts, or recorded lectures a practical learning resource that provides a satisfying learning experience, a feasible alternative to replace traditional on-campus classes, and a promoter of learning ownership (Bos et al., 2016; Traphagan et

al., 2010). A significant number of learning outcomes and psychological benefits can be promoted by using these resources, for instance: making up for missed classes, reviewing course content before exams, understanding lecture contents better, and adding more information to notes. Consequently, recorded lectures, webcasts, or podcasts can promote positive traits essential for online learning (Baran et al., 2013; Bos et al., 2016; Warschauer & Liaw, 2011). Recorded material may also reduce learners' anxiety levels (Traphagan et al., 2010), which is considered a crucial factor for academic success under the given sanitary context imposed by COVID 19 (Wang, Zhang, Zhao, Zhang & Jiang, 2020).

As a final point, socialization becomes key in academic and personal achievement. The educational community must provide students with opportunities for meaningful interaction and participation inside the school community (Elmer et al., 2020). Considering national social distancing policies and confinement, it is only feasible to use online platforms and events to provide students with the necessary environments that enhance learning and ensure mental well-being (Elmer et al., 2020; Jonassen, 1999). At the same time, it is possible to comply with curricular standards (Ministerio de Educación, 2012, 2016, 2020). However, popular online platforms available on the web that allow synchronic interaction in groups require a stable internet connection and consume significant amounts of data in limited plans or packages most users can access (Subsecretaría de Telecomunicaciones de Chile, 2017). Consequently, to provide students with opportunities to socialize in meaningful contexts and school community members, it is necessary to design strategies to effectively reach and provide the required assistance to cope with academic and emotional needs despite technological limitations (Aldowah et al., 2019; Elmer et al., 2020).

5. Conclusion

Regarding the first specific objective, which aimed to determine the contextual challenges related to technology that affect the online implementation of courses in Chile, we found that these challenges are (i) Individual Challenges (Motivations and commitment; Time), (ii) Course Challenges (Localization of the content), and (iii) Technological Challenges (Access; Cost).

Regarding the second specific objective, which dealt with determining the technological resources popular in Chile that can be used for educational purposes, we can state that the popular technological resources, have free access, and are designed for multi-devices are Facebook®, and WhatsApp Messenger®. However, Facebook is the only free internet access platform that suits all categories of educational activities.

Regarding the main objective of this research, we state that, to reduce educational-technological inequity during confinement 2020 in Chile through a non-cost feasible proposal, it is suggested to use Facebook® for collaborative learning, lectures, oral presentations, reading comprehension, written production, discussion, creative learning, and feedback. This option can support all these types of activities in a free-internet-access mode, supported for multi-device, which increases the opportunities of participation of all Chilean students in online classes. Thus, owing to its free access and multi-device support, Facebook becomes a feasible alternative to ensure socialization in the current educational context.

Finally, this proposal is feasible for confinement and normal contexts, allowing teachers to use it permanently and contribute to educational-technological equity.

6. Practical applications

It is suggested that teachers design asynchronous tasks for students to develop with a deadline but with some time flexibility, considering internet issues and the lack of available devices at home.

7. Future Studies

Future studies related to equity in online education should consider the perception of students and teachers.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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