South American Publishing

SAP Southern Studies. 2025; 1:29
doi: 10.62486/ss202529

REVIEW

Transformations and challenges facing Chilean public education in the context of a health emergency

Transformaciones y desafíos de la educación pública chilena en contexto de emergencia sanitaria

Hugo Rolando Álvarez Llancapani[1], Brillitte Lucia Vásquez Peña[1], Pamela Herrera Díaz[1]

[1]Universidad de las Américas, Facultad de Educación. Valparaíso, Chile.

Cite as
Álvarez Llancapani HR, Vásquez Peña BL, Herrera Díaz P. Transformations and challenges facing Chilean public education in the context of a health emergency. SAP *Southern Studies*. 2025; 1:29. https://doi.org/10.62486/ss202529

Publication History
Submitted: 12-07-2025
Revised: 07-09-2025
Accepted: 21-12-2025
Published: 22-12-2025

ABSTRACT

The COVID-19 health emergency placed unprecedented strain on Chile's public education system and required rapid reorganization to preserve pedagogical continuity throughout 2021. This review examines how the shift from face-to-face schooling to virtual provision—through synchronous and asynchronous instruction—was implemented, and what it revealed about school organization, teaching work, and students' learning experiences. It brings together policy and normative frameworks that protect the right to education and support inclusive curricular adjustments, while also considering the practical decisions made under conditions of uncertainty and uneven social resources. The evidence suggests that the transition involved more than adopting platforms: it reshaped teaching as techno-pedagogical and socio-emotional mediation, intensified coordination with families, and relocated learning to domestic spaces, producing markedly different outcomes depending on connectivity, household conditions, and prior digital preparedness. The review also identifies the use of active methodologies—project-based and problem-based learning, flipped classroom practices, team-based approaches, and gamification—as efforts to sustain motivation, autonomy, and interaction in online settings, with results conditioned by institutional capacity and teacher professional development. Persistent gaps in access, digital competence, and assessment practices point to risks of widening inequality and accumulating learning losses. The synthesis argues for consolidating a flexible and resilient hybrid model, supported by technological infrastructure, continuous teacher training, and inclusive policies that can respond to future disruptions without breaking educational trajectories.

Keywords: Online Education; Synchronous Learning; Asynchronous Learning; Educational Policy; Chile.

RESUMEN

La emergencia sanitaria por COVID-19 tensionó de manera inédita el sistema de educación pública chileno y obligó a reorganizar, en plazos breves, la enseñanza escolar para sostener la continuidad pedagógica durante 2021. Esta revisión examina cómo se articuló el tránsito desde la presencialidad hacia modalidades virtuales con clases sincrónicas y asincrónicas, y qué efectos dejó en la organización escolar, el trabajo docente y la experiencia de aprendizaje. Se sintetizan orientaciones y marcos normativos que resguardan el derecho a la educación e impulsan adecuaciones curriculares e inclusivas, junto con decisiones pedagógicas tomadas en un escenario de alta incertidumbre y desigualdad social. La evidencia revisada muestra que el cambio no se limitó a incorporar plataformas: redefinió el rol docente como mediación tecno-pedagógica y socioemocional, intensificó la coordinación con familias y trasladó el espacio educativo al hogar, con consecuencias heterogéneas según conectividad, capital cultural y condiciones materiales. Se identifican prácticas asociadas a metodologías activas —aprendizaje basado en proyectos y problemas, aula invertida, trabajo por equipos y gamificación— como intentos de sostener motivación, autonomía e interacción en entornos digitales, aunque su despliegue dependió de capacidades institucionales y de formación previa. Persisten brechas de acceso, preparación digital y evaluación formativa, que sugieren riesgos de profundización de desigualdades y rezagos. Se plantea la necesidad de consolidar un modelo mixto, flexible y resiliente, con infraestructura, formación continua docente y políticas inclusivas que permitan responder a futuras contingencias sin interrumpir trayectorias educativas.

Palabras clave: Educación Virtual; Clases Sincrónicas; Clases Asincrónicas; Políticas Educativas; Chile.

© 2025; The Authors. This Open access article is distributed under the Creative Commons Attribution 4.0 license (https://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Currently, despite the ongoing health emergency caused by COVID-19, the Chilean education system has maintained the school year and the functioning of educational establishments, providing coverage to its students throughout the country by offering synchronous and asynchronous classes in virtual mode.[1,2]

The health emergency caused by COVID-19 has taken the Chilean population as a surprise, as it has restricted their daily activities because of the extensive quarantines that have been decreed. Education has not been immune to these limitations, which is why face-to-face learning has been replaced by virtual learning.[3,4]

At the same time, work has moved to employees' homes, and education has taken over the living room, bedroom, or any other available space within the home.[1] Virtual classes were presented as alternatives to continue the educational process during the pandemic. To make this happen, families opened the doors of their homes.[5,6]

This research stems from the lack of studies conducted in China concerning the implementation of synchronous and asynchronous classes in virtual mode in a public educational establishment during the 2021 pandemic period. Verified research is in its infancy because the pandemic was declared in March, 2020, and the traditional education system is based on face-to-face learning.[7]

This research is important and relevant because it is necessary to prepare a virtual education system that is capable of reacting effectively to any eventuality, whether natural or caused by a pandemic such as the one we are currently experiencing.[8]

A study referred to the possibilities offered by ICT when incorporated into the education system, allowing for adaptable environments that enhance the types of communication and social interaction between teachers, students, and the community, creating more dynamic interactive spaces. The expected results of this research will serve as input to improve implementation in state-run establishments and to promote more fluid communication between the different levels of the educational community.[9,10]

In turn, it contributes to personal knowledge about the implementation of synchronous and asynchronous classes in virtual mode during times of pandemic and contributes to educational establishments throughout the country by providing relevant information when facing an emergency that limits face-to-face classes.

Similarly, this research hopes to provide support so that MINEDUC, SLEP, school administrators, and principals can obtain input on how to teach synchronous and asynchronous classes, the work of teachers, and communication among community members at a time when other possibilities for facilitating knowledge should not be dismissed, especially when technology and internet access are viable.[11,12,13]

Finally, this research contributes to future research on the implementation of synchronous and asynchronous classes at times when Chilean society requires or needs to shift from face-to-face to virtual learning. The objectives that will guide the research are presented below.[14]

DEVELOPMENT

Education in Chile

Education in Chile has been supported by various international treaties as well as national laws, decrees, and regulations since the nation's inception. Understanding the role of teachers since the system's inception is relevant to this research study.[15]

Contextualization of education

Since its inception, Chilean education has not undergone such a significant transformation in its structure, as it has experienced today as a result of this pandemic, having to adapt its face-to-face system to a virtual modality to continue with a process that benefits the student population.[16,17]

Since its inception as a republic, Chile has positioned education as a relevant issue in public affairs. In turn, republican education was guaranteed to all citizens, so it was interpreted as being universal in scope. However, to be a citizen in the republican era, it was necessary to have financial resources or hold a relevant position. It follows from the above that the concept of universal education emerged in a restricted manner.[2]

During the government of José Joaquín Prieto (1831-1841), the concept of universality took a turn in the Political Constitution of 1833, declaring that Chilean education was paramount in public affairs, through Chapter XI, Article 153: "Public education is a priority for the government," and Article 154: There shall be a superintendency of public education, which shall be responsible for the inspection of national education and its management under the authority of the government".[3]

Over the years and under the mandate of various presidents, the nation maintained its position of expanding education. A study reported that from the 1960s to the late 1980s, educational issues substantially increased. Under the mandate of President Frei Montalva (1964-1970), a profound educational reform called the "Revolution in Freedom" was initiated. This reform would extend the basic cycle from six to eight years and reformulate the study plans and programs. Between 1970 and 1973, under the mandate of President Salvador Allende Gossens, the quality, quantity, and diversity of welfare programs increased, and the material conditions of schools improved. Finally, during the civil-military government of Augusto Pinochet (1973-1989), the focus was on discipline, school textbooks, and exams, while any kind of critical reflection, social participation, or human rights issues were avoided.[18,19,20]

A sstudy notes that the governments led by the Concertación since the 1990s have implemented substantial improvements with the aim of correcting the model inherited from the dictatorship. However, these changes maintained face-to-face teaching, necessitating other measures to deliver instruction within schools, such as virtual learning.[21,22,23]

International Regulations

Chile has gone beyond its borders in matters of rights and treaties. The Chilean state has signed and ratified various treaties with

the aim of establishing and consolidating strategic alliances with other countries and strengthening and promoting the country's image.[21,22]

For its part, the Ministry of Foreign Affairs seeks to consolidate itself as a modern and efficient institution that aims to contribute to the country's development through the exercise of foreign policy with an emphasis on the needs and demands of its citizens.[4]

This research focuses on treaties related to educational matters or rights on the subject, such as the Universal Declaration of Human Rights.

Both the Political Constitution of Chile and the General Education Law establish in their principles that education is a right.

The United Nations[5] states that these rights are inherent to every person simply by virtue of their existence, regardless of nationality, ethnicity, religion, gender, language, color, or any other condition. They spring from the most fundamental rights, such as the right to life, food, work, freedom, housing, and education. The Universal Declaration of Human Rights (UDHR) was ratified in 1948 in Paris, presided over by Eleanor Roosevelt, and is based on 30 principles or articles that determine the freedoms acquired by every human being.[23,24]

Article 26 of the UDHR states that every individual has the right to education, which must be free and compulsory. The objective of education is to enable the full development of individuals and to strengthen respect and their freedoms, tolerance, and friendship among people, ethnic and religious groups, and understanding. Finally, parents who exercise the free right to choose the type of education that will achieve the above. Chile ratified the Human Rights Treaty on February 10, 1972.[25,26]

Warnock Report (1978)

This research focuses on the School Integration Program and the educational needs it supports. Understanding diversity within the classroom is relevant to understanding how teachers act to ensure quality education for all students in the country, especially in times of pandemic and virtual learning.[27,28]

The report, entitled Special Educational Needs, began to be drafted in 1974 and was completed in 1978; it established and initiated a new paradigm in special education due to the definition of special educational needs (SEN) within schools, relegating the deficit-centered culture.[29,30]

The Research Committee's objective was to analyze school actions in favor of children and young people with mental and physical disabilities residing in England, Scotland, and Wales. Among its priorities, it is necessary to specify the following: having an updated program of improvement and training for teachers; education and more opportunities for young people between the ages of 16 and 19; and guaranteeing education for children in preschool (under five years of age).[31,32]

The committee establishes that no child or young person should be considered uneducable, affirming that education is a good (right) to which everyone should have access and arguing that the purpose of education is the same for everyone, regardless of the strengths or weaknesses of the students.[33,34]

MINEDUC defines SEN as a way of working with and understanding the barriers or difficulties that students encounter when they participate, learn, and progress in relation to the school curriculum. These special educational needs are divided into temporary and permanent needs. Transitional educational needs are those requirements that the student needs for a specific period of time during their school career, which take the form of additional aid and resources, such as materials, human resources, or teaching resources, to guide their learning process in a more user-friendly way.[35,36,37]

This category includes specific language impairment (SLI), specific learning disabilities (SLD), attention deficit disorder (ADD), and borderline intellectual functioning. Permanent educational needs, on the other hand, support the needs that students will require throughout their school careers. This category includes autism spectrum disorders (ASDs), visual impairment, intellectual disability (ID), hearing impairment, multiple disabilities, and severe dysphoria.[6]

Convention on the Rights of the Child (1989)

Chile ratified this treaty on January 26, 1990, through Decree No. 830. Among its benefits, it is noteworthy that the State recognizes the intrinsic right to life of every child, along with the right to a name and nationality and to be raised by their parents whenever possible. It also defines a child as a person under the age of 18. It also guarantees protection against all forms of discrimination or punishment.[38,39] Every child has the right to education to develop on an equal footing with their peers, and the state must implement free but compulsory primary education. Finally, every child has the right to be raised with love and in an environment of happiness for their optimal comprehensive development.[7]

Jomtien Declaration (1990)

This research aims to identify the actions taken by the Chilean State in educational matters, its guidelines, and economic contributions as a measure to ensure entry, progress, and graduation from the educational system, guaranteeing the acquisition of meaningful learning.[40,41,42]

This assembly was held in Jomtien, Thailand, in the early 1990s. It ratified what more than a hundred heads of state had stipulated in 1948 in Article 26 on human rights: "everyone has the right to education."[43]

Several countries have made considerable efforts to ensure their population's right to education by strengthening their public policies in this area.[44] However, empirical reality shows the opposite: 100 million children worldwide do not have access to primary education, 60 % of whom are girls. More than 960 million adults are illiterate, which is considered an obstacle for industrialized and developing countries. More than 100 million people do not complete basic education, and a significant number, even if they do complete it, do not acquire meaningful learning.[8]

As noted above, Chile made various contributions to education in the 1990s with the aim of improving its standards. This research, which seeks to understand how implementation has developed in times of pandemic, requires an investigation into teacher training as well as the quality of learning achieved by students.[45,46]

The Dakar Framework for Action was largely based on valuable data provided by the Assessment for All carried out in 2000. Prior to the World Education Forum, the assessment of basic education, which had never before been carried out in more than 180 countries, was thoroughly verified.[47]

The objective was to analyze the reality of basic education during the 1990s, with the aim of providing relevant information on programs, activities, and services to promote and support the process. One of the tasks pending the Jomtien Convention was to provide tools to enable more children to access the basic school system. In this regard, it should be noted that between 1990 and 1998, there was an increase of 82 million enrollments. Moreover, the number of children not enrolled in school during the same period fell from 127 million to 113 million.[48,49]

In Latin America and the Caribbean, the number of out-of-school students also decreased considerably during the period mentioned, from 11,4 million to 4,8 million. Moreover, the number of literate adults in the same period increased from 2,7 billion to 3,3 billion. This was achieved only because of the commitment made by the governments in power, which implemented new policies, laws, increased funding, and frameworks for action to meet the objectives set out in Jomtiem.[50,51,52] However, with regard to the disparity between men and women and the provision of basic schooling for girls, as evidenced by the 1990 Convention, the results were not as encouraging, one of the reasons for the entrenched discrimination against women.[53,54,55]

Convention on the Rights of Persons with Disabilities (2006)

The virtual modality of the Chilean education system needs to respond to and guarantee access and accessibility to all, regardless of their condition.

In 2006, the United Nations General Assembly adopted the Convention on the Rights of Persons with Disabilities and its Optional Protocol. Chile ratified the convention in 2008 through Decree No. 201.[56,57]

The objective of the convention is to protect, ensure, and promote, on an equal basis, the full enjoyment of all human rights and freedoms by people with disabilities, promoting respect for their inherent dignity. A person with a disability is defined as anyone with permanent mental, intellectual, sensory, or physical impairments that, when interacting with their environment, restrict their full participation in society on an equal basis with their peers.[58,59] In addition, the Convention sets out the following principles: respect, autonomy, freedom of choice and independence of persons; nondiscrimination; full and effective participation in society; respect and acceptance of the diversity of the human condition; accessibility; equal opportunities; and gender equality.[60,61,62]

Communication includes languages, braille, large print, easily accessible multimedia devices, text displays, and auditory systems, among others. Language should be understood to mean oral language, sign language, and other forms of nonverbal communication. Finally, State Parties shall take legislative measures to amend or repeal relevant laws to ensure the effective rights validated in the Convention.[9]

Education 2030 Incheon Declaration (2015)

Virtual learning has presented an opportunity to rethink Chilean education, projecting a form of education that is more adaptable to any scenario, whether due to climate change, natural disasters, or health emergencies. In this new educational rethinking, the role of teachers and their preparation is crucial to ensuring its purpose.[63,64,65]

In May 2015, the World Education Forum was held in the city of Incheon, Republic of Korea. This historic meeting continued and reaffirmed the path begun in Jomtien with "Education for All" and continued in Dakar. The vision pursued by Education 2030 is to transform people's lives through gender equality in education, ensuring equitable and inclusive education with an emphasis on quality as essential for progress and providing meaningful and continuous learning throughout their lives in a permanent and timely manner.[66,67]

For this to be carried out optimally, it is crucial to increase the supply of qualified teachers and respond to the call for cooperation from developed countries in this area to serve as a guide for smaller or developing countries. While guidelines are socialized in these spaces within specific time frames, it is the states that must continue to enact, amend, or repeal laws to advance the proposed objectives. To this end, the World Forum invites collaborative work on coordinated actions.[10]

Education is the key to giving every child a better life and is the foundation of all strong societies. However, there are still many children who are being left behind. To meet our development goals, we need all children to go to school and acquire knowledge.[11]

Finally, Chile has signed various treaties with the intention of strengthening education in the country, thereby contributing to reducing illiteracy and school dropout rates, among other things. The link established by the Ministry of Foreign Affairs is relevant for understanding how other countries develop public policies to strengthen their educational guidelines. Understanding the educational process from the perspective of different actors will help us comprehend how it has permeated historical moments where face-to-face learning has been replaced by virtual learning.[68,69,70]

Below are the national regulations on education that reinforce the Chilean government's bilateral agreements on educational matters with the aim of providing quality education to more than 3 million students.[71,72]

National Regulations

National regulations on education are supported by laws and decrees, which are relevant because the research is linked to a public institution located in the fifth region.[73,74]

General Education Law [LGE] (2009)

Notably, the institutions designated in this research base their guidelines on LGE. General Education Law No. 20,370, enacted in 2009, repeals Constitutional Organic Law on Education No. 18,962, enacted in 1990. Chilean education is a right for all people, and it is the duty of the State to promote it from the preschool, elementary, and middle school levels, free of charge and compulsory, with families having the freedom to choose an institution for their children. The LGE constitutes the reference framework for education in the country with regard to general primary and secondary education.[75,76,77]

The foundations of this law are set out in the Constitution, which establishes the following principles: universality and lifelong learning; equity; diversity; quality of education; transparency; integration; flexibility; participation; autonomy; responsibility; interculturalism; and sustainability.[78,79,80]

It also states that basic education comprises grades one through six, with secondary education increasing from four to six years (four years of general education and two years of differentiated preparation). With regard to preschool education, the state should guarantee funding and free access to Transition Level 1 and Transition Level 2 formal education. For research purposes, it shall be determined.[81]

Finally, to monitor the quality of education, the State will create a National Education Quality Assurance System, which will ensure that quality standards are maintained through four institutions: the Ministry of Education, the National Education Council, the Education Quality Agency, and the Superintendency of Education.[12]

Establishes Standards on Equal Opportunities and Social Inclusion for Persons with Disabilities (2010)

Disability law is considered within the line of research because the establishment where the study will be conducted has a school integration program, thus addressing temporary or permanent special educational needs.[82]

Law No. 20,422, enacted in 2010, covers equal opportunities for people with disabilities, the absence of discrimination on the basis of their condition, and the implementation of actions aimed at preventing or compensating for disadvantages to participate fully in political, labor, educational, cultural, economic, and social life. This law bases its mission on five key principles that must be considered at all times, namely, access to independent living, goods and services, participation, social dialog, accessibility and universal design in environments, and intersectorality.[83,84]

The State shall guarantee people with disabilities access to any establishment, whether public, private, or special, as determined or required by the student, where it receives income from subsidies or state contributions. Similarly, preschool, primary, and secondary educational establishments must have plans focused on students with SEN, including the community in these plans. As a measure to guarantee the right to equality and opportunity, the State will determine actions against discrimination, resulting in better accessibility and preventing harassment.[13]

School Inclusion Law (2015)

This research is linked to the law to determine whether access to and access to education have been guaranteed during the pandemic.

School Inclusion Law No. 20,845 was enacted in 2015. Its text regulates the admission of students, eliminates shared financing, and prohibits profit-making in educational establishments that receive contributions from the state. This law is based on three pillars:

1. Ending profit-making: the law determines and mandates that the monetary resources received by the entity in charge be used solely and exclusively for educational purposes.
2. End of Co-Payment: the State commits to increasing economic resources in the form of school subsidies so that as these funds increase, schools will not be able to charge families any enrollment or monthly fees.
3. Regulation of the school admission process: MINEDUC, in collaboration with the University of Chile, makes available to families through a web platform, a single, centralized admission system.[14]

Decree No. 170. Establish Standards for Determining Students with Special Educational Needs who will be Beneficiaries of the Special Education Subsidy (2009)

Decree No. 170 is linked to the research in which selected schools support students with educational needs that fall within the scope of this regulation.[84]

Enacted in 2009, the regulation is based on Law No. 20.201/07, which establishes rules for determining which students with special educational needs will be beneficiaries of the special education subsidy.[85,86]

It is known as the "school subsidy" decree. It also defines and names temporary and permanent educational needs and identifies the appropriate professional to assess and provide a diagnosis. Notably, all professionals must be registered in the National Registry of Special Education Professionals for Assessment and Diagnosis. The evaluation process must take a comprehensive view of the student, considering a range of pedagogical and pedagogical tests with the aim of obtaining an overall picture that allows for correct decision-making in relation to the support that the student requires. In addition, the guardian will be asked to provide information that will be channeled into the anamnesis, projecting a general overview of the student, their family, and context.[15]

Decree No. 83, Approves Criteria and Guidelines for Curricular Adaptation for Students with Special Educational Needs in Early Childhood Education and Primary Education (2015)

When education is undergoing radical change and virtuality is taking over the teaching profession, teachers must take on a new challenge, which is to present diversified classes to their students mediated by a computer.[87,88]

As established on the MINEDUC website, Exempt Decree No. 83, enacted in 2015, invites a rethinking of teaching practices through the diversification of teaching in preschool and primary education (not excluding secondary education) in all educational institutions throughout the country, whether municipal, SLEP, subsidized, or private.[89,90]

This decree establishes criteria and guidelines for adapting the curriculum for students who need it, benefiting learning and allowing active participation and contributions to enrich the classroom, taking into account the diversity of students within the classroom. It also seeks to ensure that students with disabilities have access to, progress in, and obtain meaningful learning, considering the diversity of SEN as determined by the national curriculum in equal opportunities and inviting teachers to work collaboratively with the educational community.[90,91]

The diversification of teaching can be achieved through concrete, symbolic, and pictorial materials through activities and programs that are of interest to students, providing space during class for collaborative work between students and independent work, taking into account at all times the different learning rhythms that coexist in the classroom based on universal design for learning (UDL) as a strategy to ensure quality learning and in the event of not obtaining the desired results, implementing adjustments according to the learner's requirements. Finally, Decree No. 83 focuses on a paradigm of diversity with an emphasis on people's rights, unlike Decree No. 170, which presents a deficit-centered medical approach.[16]

Decree No. 67 Approves National Minimum Standards for Assessment, Grading, and Promotion (2018)

When the assessment and grading process has undergone changes because the health emergency and classes have moved from face-to-face to virtual, the decree takes effect so that schools can determine measures for their students with the aim of strengthening assessment and feedback.[92]

Decree No. 67 presents a new paradigm in terms of pedagogical use at the time of assessment, encouraging teachers to provide constant support by promoting timely feedback, thereby avoiding student repetition.[93,94]

This decree is based on assessment, grading, and promotion, approving minimum standards for primary and secondary education during the school year with the aim of promoting quality in education. Upon entering into force, it repeals Exempt Decrees No. 511/97, No. 112/99, and No. 83/01 corresponding to MINEDUC.[17]

Below is the section on basic general education according to current regulations.

General Basic Education

The phenomenon to be investigated focuses on a general basic education establishment located in the fifth region. Knowledge of the laws and regulations governing its operation is relevant to the line of investigation.[95,96] As established in Article 17 of the General Education Law (LGE) No. 20,370, there are four levels that promote formal or regular education in the country, namely, preschool, basic, secondary, and higher education, as well as educational modalities focused on supporting specific population groups. Article 19 of the aforementioned law defines basic education as follows: the educational level that promotes a comprehensive orientation in the affective, cultural, spiritual, moral, physical, social, and cognitive dimensions, allowing students to develop on the basis of their competencies in accordance with the knowledge, attitudes, and skills stipulated in the curriculum, enabling them to progress satisfactorily during the formal educational stage.[97,98]

Finally, this section outlines the various regulations of the Chilean education system, with the aim of responding to all its students and guaranteeing and providing high-quality education.[99,100]

The topic to be discussed next refers to learning theories. These studies seek to understand the developmental stage of children and young people, which will support research, with the understanding that elementary school students range in age from approximately six to 13 years old.[101]

Theories of Learning

For the purposes of this research, we consider some theorists who have based their studies on verifying how human beings learn when influenced by their context at the time of acquiring knowledge.[102]

In times of confinement due to health emergencies, it is necessary to understand how students are acquiring knowledge. Currently, the role of the family has been decisive for millions of schoolchildren who have had to adapt some physical space in their homes to continue the school year.

Stages of Development

Jean Piaget Fritz, a Swiss epistemologist, conceived of knowledge as a process that is developed and consolidated through the subject's actions on the environment. He points out that knowledge is determined by time and understood in two senses: duration and succession. These findings clarify the changes that occur during a child's development and why they do not occur immediately. The Swiss biologist added that, over the years, stages or phases of development have emerged. These are not linear and depend on organic maturation, the person's experience in contact with material objects, or experimentation with the social world.[18]

The theory presented indicates how a person should evolve from birth; however, internal and external factors modify human behavior in a positive or negative way. The following theory relates to the individual and their sociocultural context.[103]

Sociocultural Theory

Lev Semionovich Vygotsky was a Soviet psychologist and author of sociocultural or sociohistorical-cultural theory. His theory also coins constructivism and is defined as the active construction of knowledge by the subject (through their own internal activity).

However, a Russian psychologist noted that learning does not take place in isolation but rather interactively and is guided by a subject or peers influenced by some technological tool, whether remotely or in person.[19] The work of families during the COVID-19 pandemic has been significant. Teachers have had to increase communication with students, their peers, and families to maintain the educational process.[104]

The following theory shows how humans learn in relation to a model influenced by context.

Vicarious Learning

Albert Bandura (1925–2021), a Ukrainian–Canadian psychologist and educator, is credited with developing social learning theory and concepts such as self-efficacy.

Bandura notes that through learning, people are able to modify behavior patterns, expressed comments, or cognitive processes because of the individual's interaction with the environment. Learning provides new interpretations, helping to modify or suppress existing interpretations.[105]

Social learning, also known as vicarious, cognitive mental, observational, modeling, or imitation learning, occurs when two or more people interact, with one of the participants serving as a model, performing a certain behavior alongside the subject who observes the behavior. It is in this instance that, according to Bandura, social learning takes place. On this basis, he identified three determining factors: the environment, behavior, and the psychological processes of the person.[20]

The role of teachers has always transcended the barriers of mere pedagogy. In times of health crisis, they have had to provide emotional support and comfort to their students, families, colleagues, and inner circle. At times, immune to the context of the pandemic, their work has been essential in ensuring the continuity of the educational process for millions of students throughout the country.[105]

The theories presented refer to how a person should ideally grow, but each human being grows at their own pace, and from a rights-based approach, this must be respected. Educational, family, social, and economic contexts influence people in both positive and negative ways.[106]

The following section refers to some teaching methodologies used in the educational system.

Educational Teaching Methodologies

Today's generations of students are diametrically opposed to those of previous decades, as are their ways of learning and relating to their peers, teachers, and context. As a result, there is an opportunity to rethink teaching practices in conjunction with educational teaching methodologies in times of health crisis, adapting them to new scenarios, such as virtual learning, with the aim of ensuring meaningful learning for students. To guarantee quality education, teachers must be committed and prepared to develop their students' skills, encouraging participation during class through attractive and innovative teaching methods for the 21st century.[21]

Project-based learning (PBL)

Project-based learning (PBL) is a teaching method that allows students to acquire knowledge and skills by investigating and working over a period of time to answer complex questions, challenges, or problems.[22] This promotes the development of new skills in an education system that has become permeable and less rigid because of the health crisis, where teachers have taken on the challenge of finding new educational methods that guarantee meaningful learning and motivate students to be creative and improve their writing and communication skills through presentations of their work, whether in person or in synchronous and asynchronous classes.[23]

Problem-based learning (PBL)

When teachers introduce this educational methodology, problem-based learning (PBL), challenges often arise when they interact with their students, as this approach encourages constant reflection and questioning with the aim of promoting tolerance to criticism and generating a greater degree of responsibility and discipline to open up a range of possible solutions to the problem presented.[24]

The methodology is taught at the beginning of the class, where students take on a problem, which may be everyday or historical in nature, such as the COVID-19 health crisis, climate change, and water scarcity. To ensure positive results, students must take the topic seriously and reflect on it, contributing to the discussion and generating hypotheses with concrete data or facts for its eventual solution. This methodology requires students to have prior knowledge of the topics. It is therefore that "problem-based learning incorporates theory and practice, promoting students' learning processes".[25]

Given that schools must develop skills for the 21st century, PBL, as a methodology, provides broad advantages for students from the perspective of knowledge, techniques, and skills. However, its implementation is not without obstacles because the school culture is strongly rooted in the transmission of knowledge (lectures by the teacher) over the acquisition and development of skills.[26] In times when it is necessary to rethink pedagogical practice, it is important to present other proposals to promote learning.[107]

Gamification

Several years ago, playful aspects entered our daily lives, leading to attempts to gamify actions in very diverse sectors, such as education, human resources, and business.

The Anglo-Saxon concept of "gamification" dates back to 2008, and its beginnings are linked to business as a strategy to persuade users through play. Gamification can be defined as a thought process based on play and its mechanisms, inviting problem solving.[108]

In the field of education, this strategy is used to motivate students by promoting learning and problem solving. Owing to the

concept's incipient incursion into the educational system, some members of the community tend to confuse it with other similar terms, such as game-based learning and serious games. Although the concepts are connected, there are certain differences, which are detailed below:

- Gamification uses the principles and elements of games as a means to motivate learning; it does not require the actual use of games.
- Serious games: these games are computer games used for the purpose of informing and educating.
- Game-based learning: This type of learning requires the use of games or video games as a means to achieve learning objectives.

Notably, these methodologies, which were developed to promote more meaningful learning, have rules, objectives, freedom of choice, and narratives.[27] When virtuality has become established in the educational sphere because of the health crisis, presenting more playful classes is relevant to better capture the attention of students who, to access synchronous or asynchronous classes, must do so via the internet, which persistently invites them to open other pages linked to social networks.

Finally, to better understand the concept of gamification, it is necessary to clarify the use of game design elements in situations outside of gaming, using its mechanics as a means to virtually engage and motivate people to achieve their goals.[28] Its application to educational contexts is important for better explaining the teaching of complex subjects and, at the same time, teaching in a playful way.

Flipped Classroom

In relation to this educational methodology, "the flipped classroom is a teaching method whose main objective is for students to take on a much more active role in their learning process than they have traditionally had".[29] This encourages students to study independently theoretical concepts provided by the teacher with the aim of using class time to resolve doubts and hold debates on topics raised in advance by the teacher. Owing to the lockdown caused by the health crisis, applying this methodology is feasible because students spend more hours in front of the computer; thus, the teacher can send readings, short videos, or audio files in advance. The objective is for the student to verify the information and learn it, presenting their work independently. During class time, the teacher organizes activities on the basis of the material assigned in advance, focusing on answering questions about the content. The objective of the methodology is to optimize class time.

Team-based learning (TBL)

The TBL strategy was developed in the early 1990s and can be applied to courses with a large number of students or vice versa. It requires a teacher to guide the class and form work teams so that, together, they can solve the problems, cases, or projects proposed by the academic in the same classroom. A minimum of two hours is required to develop the content optimally.[30]

This methodology aims to facilitate learning through collaborative work between heterogeneous teams while also seeking to foster autonomy and responsibility among students. The key to the TBL achieving its objective is to correctly address the problem that will lead to discussion among the groups formed in advance. The role of the teacher becomes that of a mere transmitter of knowledge.

Finally, presenting educational proposals in line with 21st-century schools is the challenge posed by the current COVID-19 health crisis, with playful approaches inviting students to move from being mere passive observers to taking on a more active role guided by the teacher. Below, we present the virtual mode of education.

Virtual Education

Virtual education has been relevant in the Chilean education system since 2020 because of the suspension of face-to-face classes and the transfer of all teaching activities to the virtual modality.

It has positioned itself as a totally valid way of facilitating learning, although it does not require physical presence and is characterized by being dynamic and interactive. It is a cooperative model in which teachers and students or peers interact regardless of physical distance. In this modality, technology takes center stage, as it provides facilities that include videos, graphics, voice and data transmission (Rivera, Viera, & Pulgarón, 2010). Everyone involved in the education system has had to take on the challenge of joining virtual classes, whether synchronously or asynchronously, to continue the process of training and teaching. The role of teachers has also been affected, requiring them to resort to various technology-mediated strategies, which are sometimes easy to use and sometimes present barriers, as is typical of any new implementation.

The introduction of ICT into the education system has had a considerable effect on the learning process of hundreds of students, as well as on the role of teachers in terms of assessment and grading and how content is delivered. In turn, virtual learning implies a paradigm shift and is based on consolidating knowledge and information through intelligent systems. As has been pointed out, education in times of health emergencies has presented an opportunity to open the way to new scenarios and explore virtuality as a valid resource to guarantee quality education for all students in the country.

Contextualization of virtual education

The Ministry of Education points out that Chilean society is undergoing a profound, complex, and rapid transformation because of globalization, scientific and technological development, and the internet, which provides virtual platforms and access to social networks that reproduce inexhaustible sources of information while allowing us to keep in touch with loved ones, access

entertainment, and stay abreast of the progress of COVID-19 and scientific efforts to combat the global pandemic.

This presents an opportunity for the national education system, in times of health crisis, to continue delivering content, this time positioning virtual education as a guarantee by providing synchronous and asynchronous classes to more than 3 million students.[31]

The General Education Division invites us to reflect on the teaching methods and structure of the school system, which have remained essentially unchanged, limiting the educational process to the confines of the traditional classroom. Despite profound social and technological transformations, returning to face-to-face learning has become impossible in light of the health crisis facing the country. Cinda[32] notes that implementing a change in teaching requires providing the Ministry of Education with tools that will have a direct impact on teacher training and the role of school administrators alongside families and students. All of this will require greater resources and support to fully achieve the objective.

Assuming that all spaces for human interaction are educational settings, the General Education Division comments that although learning is situated in a context and arises from doing and that it is fundamentally social and collaborative, distance learning in a virtual environment appears to be a more accessible option, transferring the pedagogical relationship to a different space. This certainly poses great challenges for teaching practices, such as the tools of the trade and the emotional situation brought about by the health crisis.

In short, the General Education Division points out that, for the Chilean State, in the wake of the health crisis, it is vital to rethink the ways in which the educational process is carried out. It emphasizes that the country is capable of facing new challenges that will undoubtedly arise in the future with increasingly better tools and that these challenges cannot result in alterations or interruptions in the educational trajectory of students. The development of virtual learning is generating processes of transformation in the functioning, organization, and management of traditional education. These changes present problematic aspects and critical points that need to be identified and analyzed to design new strategies for the role of teachers and the implementation of synchronous and asynchronous classes.

Characteristics of virtual classes

"Virtual education brings benefits to the educational community, allowing the development of skills such as information organization, the handling of new concepts, and the expansion of language that favors communication and connectivity". In turn, Juanes et al.[33] report that to optimally develop a virtual class, it is not enough to have mastery in a certain area and to manage and share information of interest. It is also important for teachers to be constantly linked to training in relation to ICT, providing them with tools to dynamically manage virtual spaces.

For their part, Navarro et al.[34] indicate that the characteristics of the virtual teaching modality are identified by its hypertextual structure, which involves exploratory learning. They comment on the benefits of hypertextual navigation, which leads to a new way of learning and teaching characterized by interactivity, which favors processes of integration and contextualization to a degree that is difficult to achieve with linear presentation techniques, as well as learning in a friendly and safe environment for the student, on the one hand, flexibility in the times and spaces allocated to learning and, on the other hand, the prominence of interaction between participants in the process for the construction of meaningful knowledge.

The relationships among teachers, students, and content are enveloped by teaching, learning, and educational intervention. This interactive model is embodied and evidenced in the design of materials, the development of cooperative work proposals, the actions of tutors, and the evaluation instances.[35] Thus, interactive virtual learning must design strategies that enable effective synchronous and asynchronous interactions.

Un estudio presents various characteristics of virtual learning, including the following:

- Recognition of students' prior knowledge.
- Potential significance of content and materials.
- Construction of shared meanings between tutors and students.
- Cognitive conflicts arising from different content.
- Scaffolding function performed by tutors.
- Collaborative activities between students.
- Assessment, as a means of summarizing and reconstructing the learning process.

Types of resources

The Ministry of Education implemented an online learning plan because of the closure of schools throughout the country as a result of the COVID-19 health crisis. Using virtual platforms, a website called "Aprendo en Línea" (I Learn Online) was created, a virtual space that hosts school texts for different subjects, as well as a digital school library with complementary teaching materials.

The National Curriculum Department states that the Aprendo en Línea platform is the result of an initiative by the Curriculum and Assessment Unit of the Chilean Ministry of Education, which provides personalized support to the different actors in the educational process, especially teachers, by providing all the curriculum documentation (guidelines, study programs, etc.) and resources for the learning objectives of early childhood education, basic education, secondary education, and technical and vocational education.[36]

In turn, the Ministry of Education has formed a number of partnerships with different educational institutions to provide support in the development of virtual teaching methods for education professionals. The aim of this agreement is to strengthen the education system and promote collaborative work among teachers.[37]

Martínez[38] lists some types within the spectrum of virtual teaching methods, the most commonly used by teachers being those detailed below:

Learning capsule: these are tools or resources used to convey information on a topic through images, text, and narration and should last between three and five minutes.

Synchronous learning: students connect live with the teacher via a video conferencing platform.

Online questionnaires: online questionnaires make the process efficient and fast, allowing for automatic feedback delivery.

Individualized work: students work individually, making it part of their own learning process.

Virtual mode during the pandemic

Virtual learning during the health crisis has provided an opportunity to continue teaching more than 3 million students who make up the system and are distributed throughout the country. With synchronous and asynchronous classes, MINEDUC has attempted to respond to the closure of schools while preventing an increase in infections.

Pandemic context

In December 2019, an outbreak of pneumonia of unknown origin was reported in Wuhan, China, and was quickly linked to the city's market. On the basis of its research, the WHO indicates that this is a new virus related to the SARS-CoV family.

Since the discovery of the new coronavirus, SARS-CoV-2, scientists have debated its origin. Although it has been speculated that COVID-19 is the result of laboratory manipulation, genetic data suggest another hypothesis and that it is not derived from any previously known virus.[39] In their research, they analyzed genomes and compared them with previously known coronavirus genomes. These results indicate that SARS-CoV-2 has unique characteristics that distinguish it from other coronaviruses, such as optimal affinity for the angiotensin-converting enzyme 2 (ACE2) receptor and a polybasic cleavage site at the S1/S2 spike junction that determines infectivity and host range.

Ciotti et al.[39] reported that the hypothesis that it was created from a bat infection is possible, as it is similar to SARS in bats, which could be the reservoir.

The global spread of COVID-19 was so rapid that on March 12, 2020, the World Health Organization decided to declare COVID-19 a global pandemic.

The virus arrived in the country on March 3, 2020, as a result of a Chilean citizen traveling to Southeast Asia. In accordance with reports from the Chilean Ministry of Health, the case was reported by the Institute of Public Health (ISP) in conjunction with the laboratory of the Guillermo Grant Benavente Regional Clinical Hospital in Concepción.

In response to the global pandemic, MINSAL issued a health alert through Decree No. 4. This led to the issuance of Exempt Resolution No. 180 by the Undersecretary of Public Health. As a result of the large COVID-19 outbreak in the country, it was decided to suspend in-person classes because of this health crisis and to shut down all educational institutions in Chile. In response to what Chile was experiencing, the Ministry of Education (MINEDUC) decided to prioritize the curriculum in response to the educational needs of children and young people in the context of the coronavirus pandemic.[40]

According to UNICEF, from March 2020 to February 2021, schools were closed for an average of 95 days, and in Latin America and the Caribbean, that figure increases to 158 days, making it the region with the highest average number of days in which these establishments were closed. UNESCO notes that all 33 countries in Latin America and the Caribbean have temporarily closed their educational establishments at the national level.

Although the Mineduc Study Center maintains that, in Chile, as in the rest of the world, most education systems have made efforts to respond to curricular demands virtually, it seems that this has not been sufficient for learning development, given that regardless of how prepared the school is to implement a virtual curriculum, there are other factors that also affect this process, such as students with fewer resources who do not have access to the internet or who have very limited access. The Ministry's records show that during the first half of 2021, schools began to offer classes through virtual platforms.[41]

Health management in Chile

COVID-19 management in Chile was implemented through health protocols that came into effect on March 27, 2020. The main health measures included the disinfection of public and private places, as well as self-care through regular hand washing, the use of masks, and the use of alcohol gel.

The following aspects of the health protocol are noteworthy:

The "Paso a Paso nos cuidamos" (Step by Step We Take Care of Ourselves) plan was presented in July 2020 as a gradual strategy to address the pandemic according to the health situation in each area of our country. During October 2021, the current government made updates to the plan, considering factors such as the advanced vaccination process; the strengthening of health infrastructure; testing, traceability, and isolation strategies; and a multisectoral approach, with the aim of better balancing and weighing the country's different objectives and needs.[42] This plan involves restrictions depending on the increase in cases:

- Step 1 restriction
- Step 2 transition
- Step 3 Preparation
- Step 4 Initial opening
- Step 5 Advanced opening Protocols for education

This protocol is primarily for education staff and students attending face-to-face classes. The main features include the following rules: it will be voluntary; families will freely decide whether to send their children and adolescents to school. A hybrid system will

be used, prioritizing in-person classes, combined with remote classes when necessary, ensuring education for all students in the country. It will be gradual and flexible, with students gradually incorporating it into the in-person system.

The Chilean government has issued a protocol of health measures, which includes the following: 1-meter distancing, ventilation of enclosed spaces, mandatory use of masks (except for children under 4 years of age), and frequent hand washing, among others. COVID-19 school insurance (which also covers associated benefits, such as PIMS) for all preschool and school students belonging to FONASA and the start of the vaccination process for minors between 12 and 17 years of age. Process the immunization process was complete for all education workers.[43]

Vaccination schedule

As part of its responsibilities, the government was preparing to reopen establishments soon; however, the percentage figures for the same dates were in 2020 and 2021. Therefore, to safeguard the life of the population, a vaccination schedule by age group was established.

The vaccination schedule is a measure to organize the immunization system, which is divided each week by age, starting with the elderly and ending with infants. Chile acquired six different vaccines to supply the population, which were free and voluntary.[44]

Finally, since the first person was infected with COVID-19, the Chilean government has implemented various strategies to safeguard the health of the population and, especially, to continue the educational process. The following is the topic of the teaching and learning process during the 2021 pandemic.

Teaching and learning processes during the pandemic of 2021

A few decades ago, the idea of virtual education was unthinkable, but the health crisis forced this process as a result of the closure of hundreds of establishments across the country. Providing virtual spaces to continue. The teaching and learning process was a challenge for MINEDUC, which is why it decided to implement synchronous and asynchronous classes.

Educational guidelines during the pandemic

The need to formulate specific proposals in terms of curriculum and pedagogy is based on the observation of a twofold problem that public policy has in this area.[45]

Institutional guidelines

According to the Mineduc Study Center[37], these are recommendations that seek to guide decision-making in education policy. The actions established for their implementation are considered appropriate and effective for achieving the desired goals.

Curriculum prioritization

Curriculum prioritization is a pedagogical framework that determines essential learning objectives, ensuring that they can be achieved to the maximum extent possible given the circumstances in the country.[46] This curriculum prioritization is proposed for all levels of regular education from preschool to 12th grade, including general education for 11th and 12th grades, in addition to the differentiated plan for technical and vocational education (35 specialties) and education for youth and adults. Each and every subject was regulated to provide support and pedagogical tools.[41] This curriculum modification remains in effect until the end of the 2021 school year. To guide the implementation of this new curriculum, the Ministry of Education[46] indicated that various guidelines are available to management teams and teachers, both remotely and in person.

Safe Return Plan

The Safe, Gradual, and Participatory Return Plan is a tool that we hope will become a practical and useful instrument, contributing to greater clarity regarding the steps we must gradually take in this process, together and for the well-being of all.

Its objective is to develop a proposal for an institutional plan that will allow the gradual, safe, and participatory return to in-person work for employees of the Service Directorate. This plan applies to all employees who work in the units and departments of the Health Service, Community Service, and Educational Establishments Directorate.

The Ministry of Education created an additional support fund of $25 billion, with the aim of enabling educational establishments to reopen their doors safely, thus protecting the integrity of every employee, student, and family in the educational community.[47]

Role of teachers during the pandemic

The role of teachers is centered on acting as mediators or intermediaries between the content and the activity they carry out.

Teachers must personally analyze the following aspects, which include the cognitive, affective, somatic, interpersonal, and behavioral aspects, to work on their state and reach the optimal level for teaching. Among the most important steps that teachers must take in virtual and face-to-face classes is to give a brief greeting, present the topic by explaining the fundamental concepts that must be known, always give clear instructions for independent learning (bibliography, videos, etc.), and always listen to students when they have questions or points they do not understand. In face-to-face classes, the well-being of students should always be prioritized by respecting and teaching the basic and simple measures implemented by the government, such as social distancing, frequent hand washing, and the use of masks, which should be changed every three hours.

Comprehensive School Education

We can define comprehensive education as a continuous, ongoing, and participatory process that seeks to harmoniously and coherently develop each and every dimension of a human being (ethical, spiritual, cognitive, emotional, communicative, aesthetic, physical, and sociopolitical).

Comprehensive education for students aims to develop the skills, values, and abilities that will benefit their academic careers. It is a continuous, ongoing, and participatory process that seeks to achieve the full realization of the student, preparing them to successfully face the problems that exist in society.

Framework for good teaching

The COVID-19 pandemic has had a direct effect on teaching. Rethinking teaching practices and positioning ICT will be essential for the successful delivery of virtual classes.

The Framework for Good Teaching is reflected in the teaching role and comprehensive training, as it is a guide for professionals who work in classrooms and, above all, are educators committed to the training of their students. It assumes that, to achieve good teaching, teachers engage in the task as individuals, with all their abilities and values. This framework is divided into four domains, categorized from A to D.

Domain A refers to teaching preparation, which is the discipline taught by the teacher, as well as the pedagogical principles and skills necessary to organize the teaching process.

Domain B is the creation of an environment conducive to learning. This domain is relevant, as the quality of student learning depends largely on the social, emotional, and material components of learning.

Domain C: Teaching for the learning of all students. This domain involves all aspects of the teaching process that enable students to truly engage with their learning.

Domain D: Professional responsibilities. To this end, teachers consciously and systematically reflect on their practices and reformulate them, helping ensure the quality of education for all students.

In times of pandemic, it is necessary for teachers to reflect when teaching their classes. Considering that teachers have had to adapt to a new scenario, generating virtual interaction with their students, they have kept the Framework for Good Teaching in mind when planning their classes.

Virtual Learning Strategies

Having strategies in place to address the new educational scenario is essential in times when face-to-face education has been replaced by virtual education. The following section outlines some strategies that have allowed the education system to continue developing despite living with a pandemic.

Types of classes

MINEDUC was developed for blended classes in 2021: in-person and distance learning. This measure is based on studies and suggestions from international organizations such as UNESCO, the UN, and the WHO, among others, which maintain the need to keep schools open while maintaining continuity of education, taking into account the precautions required due to the pandemic.[42]

Currently, owing to the pandemic, there are various ways to facilitate virtual learning and achieve teacher–student interactivity. Interactivity is essential when communication situations are developed, whether face-to-face or through internet-mediated platforms. The term comes from listening and speaking.

A study notes that e-learning (electronic learning) is also referred to as virtual learning or tele-training. It is a teaching system that requires the use of the internet in conjunction with ICTs to enable learning and interaction between users. Moreover, Morán[48] mentions that blended learning emerged in the late 1990s and, more recently, because of the pandemic, its use has been required in connection with school activities through both face-to-face and online modalities.

In the case of mobile learning, teacher–student or peer interactions take place via cell phones or tablets. Among the benefits of these devices is that they encourage more active student participation by interacting directly with an educational application. For example, when watching an interactive video on a cell phone or tablet, students can hear sounds and perform actions such as moving objects, writing, or painting, both inside the classroom and in any other room.

Considering the various ways of teaching in previous decades, these have become relevant during health emergencies. The hybrid, synchronous, and asynchronous classes are referenced below.

Hybrid Classes

According to a study, hybrid learning combines two actions during class, virtuality and face-to-face interaction, providing students with greater flexibility in terms of timetables and adding new channels of teacher–student dialog and various forms of remote support, which favors the development of active, cooperative, investigative, and collaborative learning.

Synchronous and Asynchronous Classes

Bustos[49] states that remote teaching occurs when the teacher and the student, along with the content, do not occupy a common physical space and are separated in both distance and time. For teaching to take place or knowledge to be facilitated, ICTs are needed, as well as video conferencing, emails, audio, applications, and discussion boards, among others, which relegate physical presence to the background.

Remote teaching requires both modalities to achieve better education. Synchronous classes are defined as the ability to learn and interact in situ among peers and with the teacher. In contrast, asynchronous learning takes place autonomously, without teacher–student interaction at the time, mediated by videos, guides, forums on virtual platforms, and educational resources shared in advance by the person in charge.[50]

Resources

Virtual learning resources contribute to education through the use of teaching tools that develop students' skills and knowledge. These are presented in various learning environments that allow students quick and easy access to information. They are presented as active teaching methodologies, providing interaction between teachers and students and allowing content to be organized and implemented.

Virtual platforms

LMS (learning management systems), virtual training platforms, are applications specifically conceived and designed to manage and conduct teaching and learning processes in a more or less private web environment, and an increasing number of centers are adding them to their repertoire of resources.[51]

In 2020 alone, the number of students using virtual platforms increased to 18 478, according to the Ministry of Education.

Currently, the most widely used platforms in Chile are as follows:

- Zoom: this is a cloud-based videoconferencing service that can be used to meet virtually with other people, either by video or audio only or both. This platform allows up to 500 people to connect at once in a single session.
- Clickmeeting: this is browser-based software that works on all devices and operating systems. It does not require installation, configuration, or computer skills.
- Google Classroom: this is a tool created by Google in 2014 and designed exclusively for the world of education. Its mission is to enable the management of a classroom in a collaborative and ly via the internet, serving as a platform for learning management or learning management systems.
- Google Meet: this video conferencing service was developed by Google. It is one of two applications that make up the new version of Hangouts, the other being Google Chat.
- Microsoft Teams: this is a unified communication and collaboration platform that combines persistent workplace chat, video meetings, file storage, and application integration.
- WhatsApp: this is a fast-running application used to send and receive messages and make video and voice calls.

Finally, to maintain the continuity of the educational model, various resources had to be implemented in a system accustomed to teaching classes in person. The school community took on the challenge of implementing synchronous and asynchronous classes in virtual mode.

Chapter three of the research, which refers to the Methodological Framework, is presented.

CONCLUSIONS

In conclusion, the evidence reviewed showed that the Chilean education system managed to maintain educational continuity during the health emergency through synchronous and asynchronous classes, although it was strained by gaps in connectivity, digital literacy, and unequal family conditions. The regulatory and international framework (LGE; Decrees 170, 83, and 67; Incheon Declaration; Conventions on the Rights of the Child and Persons with Disabilities) provided the basis for safeguarding the right to education and guiding adjustments in accessibility, assessment, and curriculum diversification. In this context, the role of teachers was redefined as techno-pedagogical mediators, coordinating communication with families and providing social-emotional support, while the school community enabled new learning spaces in the home. Moreover, the incorporation of active methodologies (PBL, problem-based learning, flipped classroom, TBL, and gamification) has shown potential for sustaining commitment, autonomy, and collaboration, provided that there is protected time, timely feedback, and relevant resources.

In the future, there is a need to consolidate a resilient and mixed educational ecosystem capable of moving flexibly between face-to-face and virtual learning without interrupting trajectories. This implies strengthening infrastructure and connectivity; institutionalizing continuous teacher training in the pedagogical integration of ICT and assessment for learning; ensuring differentiated support for students with SEN; and deepening curriculum prioritization with a focus on essential objectives and socioemotional well-being. It is also advisable to strengthen intersectoral coordination and monitoring mechanisms to detect gaps and abandon purely transmissive practices. In short, the pandemic acted as a catalyst for change: It highlights persistent inequalities but also enables innovations that, if systematized and scaled up, can improve the quality, relevance, and inclusion of the Chilean education system.

FINANCING

The authors did not receive funding for the development of this research.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Hugo Rolando Álvarez Llancapani, Brillitte Lucia Vásquez Peña, Pamela Herrera Díaz.
Data curation: Hugo Rolando Álvarez Llancapani, Brillitte Lucia Vásquez Peña, Pamela Herrera Díaz.
Formal analysis: Hugo Rolando Álvarez Llancapani, Brillitte Lucia Vásquez Peña, Pamela Herrera Díaz.
Writing – original draft: Hugo Rolando Álvarez Llancapani, Brillitte Lucia Vásquez Peña, Pamela Herrera Díaz.
Writing – review and editing: Hugo Rolando Álvarez Llancapani, Brillitte Lucia Vásquez Peña, Pamela Herrera Díaz.

BIBLIOGRAPHIC REFERENCES

1. Brítez M. La educación ante el avance del COVID-19 en Paraguay. Comparativo con países de la Triple Frontera. 2020; p.1-15.

2. Nuñez Prieto I. Educación chilena en la República: promesas de universalismo y realidades de inequidad en su historia. Psicoperspectivas. 2015;14:5-16.

3. Biblioteca del Congreso Nacional de Chile. Constituciones políticas y actas constitucionales. Santiago: BCN; s.f. https://www.bcn.cl/historiapolitica/constituciones/index.html

4. Ministerio de Relaciones Exteriores de Chile. Cuenta pública participativa 2019–2020. Santiago: Ministerio de Relaciones Exteriores; 2020.

5. Naciones Unidas Derechos Humanos. ¿En qué consisten los derechos humanos? Ginebra: ONU; s.f. https://www.ohchr.org/sp/issues/pages/whatarehumanrights.aspx

6. Fundación Chile. Análisis de la implementación de los programas de integración escolar (PIE) en establecimientos que han incorporado estudiantes con necesidades educativas especiales transitorias (NEET). Santiago: Fundación Chile; 2013. p.1-40.

7. Biblioteca del Congreso Nacional de Chile. Decreto 830. Promulga Convención sobre los Derechos del Niño. Santiago: BCN; s.f. https://www.bcn.cl/leychile/navegar?idNorma=15824

8. Fiske E. Foro Mundial sobre la Educación. Dakar: Graphoprint; 2000.

9. Biblioteca del Congreso Nacional de Chile. Decreto 201. Promulga la convención de Naciones Unidas sobre los derechos de las personas con discapacidad y su protocolo facultativo. Santiago: BCN; s.f. https://www.bcn.cl/leychile/navegar?idNorma=278018

10. Educación 2030. Declaración de Incheon y Marco de Acción ODS-4. Incheon: UNESCO; 2015.

11. Lake A. Educación 2030. Declaración de Incheon. Incheon: UNESCO; 2015.

12. Biblioteca del Congreso Nacional de Chile. Ley General de Educación. Santiago: BCN; 2009. https://www.bcn.cl/leychile/navegar?idNorma=1006043

13. Biblioteca del Congreso Nacional de Chile. Ley 20.422. Establece normas sobre igualdad de oportunidades e inclusión social de personas con discapacidad. Santiago: BCN; s.f. https://www.bcn.cl/leychile/navegar?idNorma=1010903

14. Ministerio de Educación de Chile. Ley de inclusión escolar. Santiago: Ministerio de Educación; s.f. https://liderazgoescolar.mineduc.cl/ley-inclusion-escolar-2/

15. Biblioteca del Congreso Nacional de Chile. Decreto 170. Santiago: BCN; 2009.

16. Ministerio de Educación de Chile. Educación Especial: antecedentes generales. Santiago: Ministerio de Educación; 2017. https://especial.mineduc.cl/implementacion-decreto-83/preguntas-frecuentes/antecedentes-generales/

17. Biblioteca del Congreso Nacional de Chile. Decreto Nº 67. Aprueba normas mínimas nacionales sobre evaluación, calificación y promoción. Santiago: BCN; s.f. https://www.bcn.cl/leychile/navegar?idNorma=1127255

18. Arias N, Flórez R. Aporte de la obra de Piaget a la comprensión de problemas educativos: su posible explicación del aprendizaje. Rev Colomb Educ. 2011; p.93-105.

19. Guerra J. El constructivismo en la educación y el aporte de la teoría sociocultural de Vygotsky para comprender la construcción del conocimiento en el ser humano. Dilemas Contemp Educ Política Valores. 2020; p.1-21.

20. Ocadiz-Parra I. Aprendizaje y comunicación social en niños de 3 a 5 años desde la teoría de Albert Bandura. Bol Cient Esc Sup Atotonilco Tula. 2015;2(3). doi:10.29057/esat.v2i3.1448.

21. Londoño C. 6 metodologías de enseñanza que todo profesor innovador debería conocer. Elige Educar; 2017 ago 1. https://eligeeducar.cl/ideas-para-el-aula/6-metodologias-ensenanza-profesor-innovador-deberia-conocer/

22. García J, Pérez J. Aprendizaje basado en proyectos: método para el diseño de actividades. Rev Tecnol Cienc Educ. 2018;(10):37-63.

23. Causil L, Rodríguez A. Aprendizaje basado en proyectos (ABP): experimentación en laboratorio, una metodología de enseñanza de las Ciencias Naturales. Plumilla Educativa. 2021;27(1):105-28.

24. Heinze-Martin G, Olmedo-Canchola V, Andoney-Mayén JV. Uso de las tecnologías de la información y comunicación (TIC) en las residencias médicas en México. Acta Méd Grupo Ángeles. 2017;15(2):150-3.

25. Carrió M, Agell L, Rodríguez G, Larramona P, Pérez J, Baños J. Percepciones de estudiantes y docentes sobre la implementación del aprendizaje basado en problemas como método docente. Fundación Educ Méd. 2018; p.143-52.

26. Lozano M. El aprendizaje basado en problemas en estudiantes universitarios. Tend Pedagóg. 2021;37:90-103.

27. Edu Trends. Gamificación. Monterrey: Instituto Tecnológico y de Estudios Superiores de Monterrey; 2016.

28. González L, Labarga I, Pérez P. Gamificación y elementos propios del juego en revistas nativas digitales: el caso de MARCA Plus. Rev Comun. 2019; p.52-72.

29. Berenguer C. Acerca de la utilidad del aula invertida o flipped classroom. Alicante: Universidad de Alicante, Instituto de Ciencias de la Educación; 2016. p.1-25.

30. Moraga D, Soto J. TBL – Aprendizaje basado en equipos. Estudios pedagógicos. 2021; p.437-47.

31. Ministerio de Educación de Chile. Apoyos del Mineduc durante la pandemia del Covid-19. Santiago: Ministerio de Educación; 2020 may 14. https://www.mineduc.cl/apoyos-del-mineduc-durante-la-pandemia-del-covid-19/

32. Cinda C. Proyecto interuniversitario de desarrollo institucional. División de Educación Superior del Ministerio de Educación de Chile. Santiago: CINDA; 2000 mayo. https://cinda.cl/wp-content/uploads/2019/01/las-nuevas-demandas-del-desempeno-profesional-y-sus-implicancias-para-la-docencia-universitaria.pdf

33. Juanes B, Munévar O, Cándelo H. La virtualidad en la educación: aspectos claves para la continuidad de la enseñanza en tiempos de pandemia. Conrado. 2020; p.448-52.

34. Navarro R, Alberdi M. Educación en línea: nuevos modelos de la relación docente–alumno en la educación a distancia. Santiago: EDUCREA; 2021. https://educrea.cl/educacion-en-linea-nuevos-modelos-de-la-relacion-docente-alumno-en-la-educacion-a-distancia/

35. División de Educación General. Orientaciones DEG. Santiago: Ministerio de Educación; 2020. https://www.mineduc.cl/?s=DEG

36. Curriculum Nacional. Acerca de este sitio. Santiago: Ministerio de Educación; 2020 abr. https://www.curriculumnacional.cl/estudiantes/Educacion-General/135457

37. Centro de Estudios Mineduc. Santiago: Ministerio de Educación; 2021. https://centroestudios.mineduc.cl/

38. Martínez V. Paradigmas de investigación. Guadalajara: UDGVirtual; 2013. p.1-10.

39. Ciotti M, Liccozzi M, Terrinoni A, Jiang WC, Bernardini S. La pandemia COVID-19. Taylor & Francis Online. 2020; p.8.

40. Ministerio de Educación de Chile. Educación en pandemia: principales medidas del Ministerio de Educación en 2020. Santiago: Ministerio de Educación; 2020.

41. Ayuda Mineduc. Priorización curricular. Santiago: Ministerio de Educación; 2020. https://ayudamineduc.cl/ficha/priorizacion-curricular

42. Gobierno de Chile. Plan de acción por coronavirus. Santiago: Gobierno de Chile; 2021. https://www.gob.cl/coronavirus/pasoapaso/

43. Gobierno de Chile. Preguntas y respuestas sobre el retorno a clases 2021. Santiago: Gobierno de Chile; 2021 feb 19. https://www.gob.cl/noticias/preguntas-y-respuestas-sobre-el-retorno-clases-2021/

44. Ministerio de Salud (MINSAL). Yo me vacuno: calendario de vacunación masiva contra COVID-19. Santiago: MINSAL; 2021. https://www.minsal.cl/calendario-de-vacunacion-masiva-contra-covid-19/

45. Colegio de Profesores de Chile. Orientaciones para el trabajo pedagógico en tiempos de pandemia. Santiago: Colegio de Profesores; 2020.

46. Ministerio de Educación. Priorización curricular. Santiago: Ministerio de Educación; 2020. https://www.curriculumnacional.cl/portal/Secciones/Curriculum-transitorio/178042:Priorizacion-Curricular

47. Ministerio de Educación. Orientación al sistema escolar. Santiago: Ministerio de Educación; 2020 mar 27. https://www.mineduc.cl/wp-content/uploads/sites/19/2020/03/OrientacionesContextoCOVID19_2703.pdf

48. Morán L. Blended learning: desafío y oportunidad para la educación actual. Rev Electr Tecnol Educ. 2012; p.1-19.

49. Bustos N. Enseñanza sincrónica y asincrónica: ¿cuál es su diferencia? BridgeEnglish; 2020 mayo 26. https://bridgeenglish.cl/blog/ensenanza-sincronica-y-asincronica-cual-es-su-diferencia/

50. Delgado P. Aprendizaje sincrónico y asincrónico: definición, ventajas y desventajas. Observatorio de Innovación Educativa, Tec de Monterrey; 2020 jun 23. https://observatorio.tec.mx/edu-news/aprendizaje-sincronico-y-asincronico-definicion

51. Díaz Becerro S. Introducción a las plataformas virtuales en la enseñanza. Rev Dig Profes Enseñanza. 2010.

52. Albion P, Tondeur J, Forkosh-Baruch A, Peeraer J. El desarrollo profesional de los docentes para la integración de las TIC: hacia una relación recíproca entre la investigación y la práctica. Educ Inf Technol. 2015;20:655-73.

53. Anderson S, Uribe M, Valenzuela JP. Reforming public education in Chile: The creation of local education services. Educational Management Administration & Leadership. 2023;51:481-501. doi:10.1177/1741143220983327.

54. Arias F. El proyecto de investigación. Introducción a la metodología científica. 5ª ed. Caracas: Episteme; 2006.

55. Arias-Ortega KE, Cárdenas VV, Sanhueza-Cstay E. Dispossession of Indigenous Knowledge in the Chilean Education System: Mapuche Experiences in Chile. Journal of Latinos and Education. 2024;23:1502-13. doi:10.1080/15348431.2023.2276782.

56. Azuero Á. Significatividad del marco metodológico en el desarrollo de proyectos de investigación. Koinonia. 2018; p.110-27.

57. Balestrini M. Cómo se elabora el proyecto de investigación. 7ª ed. Caracas: BL Consultores Asociados; 2006.

58. Bellei C, Contreras M. Post-Pandemic Crisis in Chilean Education. The Challenge of Re-institutionalizing School Education. In: Reimers FM, editor. Schools and Society During the COVID-19 Pandemic: How Education Systems Changed and the Road Ahead. Cham: Springer Nature Switzerland; 2024. p. 43-62. doi:10.1007/978-3-031-42671-1_3.

59. Bellei C, Munoz G. Models of regulation, education policies, and changes in the education system: a long-term analysis of the Chilean case. J Educ Change. 2023;24:49-76. doi:10.1007/s10833-021-09435-1.

60. Belloch C. Las tecnologías de la información y comunicación en el aprendizaje. Valencia: Universidad de Valencia, Departamento de Métodos de Investigación y Diagnóstico en Educación; 2012. p.1-9.

61. Biblioteca del Congreso Nacional de Chile. Decreto 114 Exento de 11 de junio de 1983. Santiago: BCN; s.f. https://www.bcn.cl/leychile/navegar?idNorma=9473

62. Biblioteca Nacional del Congreso de Chile. Decreto 830. Promulga Convención sobre los Derechos del Niño. Santiago: BCN; s.f. https://www.bcn.cl/leychile/navegar?idNorma=15824

63. Blanco R. Hacia una escuela para todos y con todos. UNESCO; 2017 mayo 4. https://silo.tips/download/hacia-una-escuela-

para-todos-y-con-todos

64. Blasco T, Otero L. Centro Nacional de Medicina Tropical. Instituto de Salud Carlos III. Madrid; 2008. https://www.nureinvestigacion.es/OJS/index.php/nure/article/view/408/399

65. Bonilla J. Las dos caras de la educación en el COVID-19. CienciAmérica. 2020;9(2):89-98.

66. Bravo D, Castillo E. Estudio longitudinal empleo-Covid19: datos de empleo en tiempo real. Santiago: Centro UC Encuestas y Estudios Longitudinales; 2020 oct 8. https://www.uc.cl/site/assets/files/11636/presentacion-estudio-empleo-covid19-datos-de-empleo-en-tiempo-real-8-octubre2020.pdf

67. Cárdenas C. El movimiento estudiantil chileno (2006-2016) y el uso de la web social: nuevos repertorios de acción e interacción comunitaria. Última Década. 2016; p.93-116.

68. Carrasco S, Baldivieso S. Educación a distancia sin distancias. México: Universidades UDUAL; 2016. (Publicación núm. 70, p.7-12).

69. Castro M. Política, educación y territorio en Chile (1950-2010). De las acciones colectivas a las acciones del mercado. Educ Educ. 2012.

70. Catellano R. El concepto de caso. Barcelona: Universidad de Barcelona; 2017 mayo. http://www.ub.edu/casosenxarxa/el-concepto-de-caso/#.YYx4aWDMK01

71. Centro de Estudios Mineduc. CBR Mineduc. Santiago: Ministerio de Educación; 2017. https://centroestudios.mineduc.cl/wp-content/uploads/sites/100/2017/06/CBR_Mineduc-WEB.pdf

72. Cerda H. Los elementos de la investigación. Cómo reconocerlos, diseñarlos y construirlos. 2ª ed. Santa Fe de Bogotá: El Búho; 1993.

73. Céspedes A. 100 preguntas sobre educación. Santiago de Chile: Penguin Random House; 2014.

74. Cox C, Jara Ibarra C, Sánchez Bachmann M. Citizenship education in Chile: Curricular orientations and teachers' beliefs in a context of political crisis and social mobilization. The Curriculum Journal. 2022;33:314-30. doi:10.1002/curj.164.

75. Crisol E, Herrera L, Montes R. Educación virtual para todos: una revisión sistemática. Educ Knowl Soc. 2020; p.1-13.

76. Curriculum Nacional de Chile. Recursos para enseñar y aprender. Santiago: Ministerio de Educación; s.f. https://www.curriculumnacional.cl/portal/

77. Delors J. Los cuatro pilares de la educación. Informe a la UNESCO de la Comisión Internacional sobre la Educación para el Siglo XXI. París: UNESCO; 1996. p.91-103.

78. Deroncele Á. Paradigmas de investigación científica. Abordaje desde la competencia epistémica del investigador. Arrancada. 2020; p.211-25.

79. Donoso Romo A. Movimiento estudiantil chileno de 2011 y la lógica educacional detrás de su crítica al neoliberalismo. 2020; p.1-18.

80. Donoso S, Pavlic RD, Cumsille RB. Social policy expansion from below? The case of Chile's student movement and free tuition higher education. World Development. 2023;167:106213. doi:10.1016/j.worlddev.2023.106213.

81. Educrea. Educación en línea: nuevos modelos de la relación docente-alumno en la educación a distancia. Santiago: EDUCREA; 2021. https://educrea.cl/educacion-en-linea-nuevos-modelos-de-la-relacion-docente-alumno-en-la-educacion-a-distancia/

82. Espinoza O, Corradi B, González L, Sandoval L, McGinn N, Vera T. Segmentation in higher education in Chile: Massification without equality. Higher Education Quarterly. 2024;78:536-50. doi:10.1111/hequ.12465.

83. Falabella A. El mercado escolar en Chile y el surgimiento de la nueva gestión pública: el tejido de la política entre la dictadura neoliberal y los gobiernos de la centroizquierda (1979–2009). Educ Soc. 2015; p.699-722.

84. Gallardo E. Metodología de la investigación: manual autoformativo interactivo. 1ª ed. Huancayo: Universidad Continental; 2017.

85. Gómez J. El paradigma interpretativo y el mejoramiento de la competencia oral en lengua inglesa en los estudiantes de grado décimo del Colegio Politécnico de Sogamoso - Boyacá. Bogotá: Fundación Universitaria Juan N. Corpas, Centro Editorial, Ediciones FEDICOR; 2020.

86. Guzmán-Valenzuela C. Navigating public goods: Chilean public universities and their transformative role in Latin America. High Educ. 2025;89:147-65. doi:10.1007/s10734-024-01298-8.

87. Heiss C. Chile: entre el estallido social y la pandemia. Agenda 2030. 2020; p.1-14.

88. Henríquez de Villegas V, Villegas Rodríguez HM. La pandemia: un reto a la educación. El Mundo; 2020 mar 21. https://www.elmundo.com/noticia/La-pandemia-un-reto-a-la-educacion/379264

89. Hernández R. Academia: acelerando la investigación mundial. Academia.edu; 2008. https://www.academia.edu/RegisterToDownload/BulkDownload

90. Lazor Á, Kledzik A. Enseñanza individual a través de Skype y Google Docs. Foro Profesores E/LE. 2013;9:83-8.

91. Leymonié J. Nativos e inmigrantes digitales: ¿cómo aprendemos y enseñamos? Rev Comun. 2015; p.11-9.

92. Medina C. Paradigmas de investigación sobre lo cuantitativo y lo cualitativo. Cienc Ing Neogranadina. 2001;(10):79-84.

93. Mejía-Gallegos C, Michalón-Dueñas D, Michalón-Acosta R, López-Fernández R, Palmero-Urquiza D, Sánchez-Gálvez S. Espacios de aprendizaje híbridos: hacia una educación del futuro en la Universidad de Guayaquil. Medisur. 2017; p.350-5.

94. Ministerio de Educación. Educación Superior Mineduc. Santiago: Ministerio de Educación; 2020. https://educacionsuperior.mineduc.cl/protocolo-provisorio-covid-19/recursos-para-ensenanza-a-distancia/

95. Ministerio de Educación. Fondo de apoyo a establecimientos para retorno seguro. Santiago: Ministerio de Educación; 2020. https://www.mineduc.cl/fondo-de-apoyo-a-establecimientos-para-retorno-seguro/

96. Ministerio de Educación de Chile. Evidencias: efectos de la suspensión de clases presenciales en contexto de pandemia por COVID-19. Santiago: Ministerio de Educación; 2021.

97. Ministerio de Educación de Chile. Mineduc entrega detalles de cifras de deserción escolar 2021. Santiago: Ministerio de Educación; 2021 abr 5. https://www.mineduc.cl/mineduc-entrega-detalles-de-cifras-de-desercion-escolar-2021/

98. Ministerio de Educación de Chile. Priorización Curricular. Santiago: Ministerio de Educación; s.f. https://www.ayudamineduc.cl/ficha/priorizacion-curricular

99. Ministerio de Educación de Chile. Programa Yo elijo mi PC. Santiago: Ministerio de Educación; s.f. https://www.ayudamineduc.cl/ficha/programa-yo-elijo-mi-pc

100. Ministerio de Educación de Chile. Resolución Exenta Nº 2765: Implementación de la Priorización Curricular en forma remota y presencial. Santiago: Ministerio de Educación; 2020 jun 26. https://www.curriculumnacional.cl/portal/Documentos-Curriculares/Priorizacion-Curricular/Fundamentos-y-Orientaciones/209381

101. Ministerio de Educación de Colombia. Educación virtual o educación en línea. Bogotá: Ministerio de Educación; 2017 feb 7. https://www.mineducacion.gov.co/1759/w3-article-196492.html?_noredirect=1

102. Ministerio de Salud. Ministerio de Salud confirma primer caso de coronavirus en Chile. Santiago: MINSAL; 2020. https://www.minsal.cl/ministerio-de-salud-confirma-primer-caso-de-coronavirus-en-chile/

103. Morales M. Docencia remota de emergencia frente al COVID-19 en una escuela de medicina privada de Chile. Concepción: Departamento Educación Médica; 2020.

104. Morais LM de O, Guevara-Aladino P, Valdebenito R, Díaz N, Indvik K, Sarmiento OL, et al. Urban transformations, community participation, and health: inter-sectoral and cross-country learning experience between Brazil, Chile, and Colombia. Cities & Health. 2023;7:59-70. doi:10.1080/23748834.2022.2086373.

105. Naciones Unidas. Declaración Universal de Derechos Humanos. Nueva York: ONU; s.f. https://www.un.org/es/about-us/universal-declaration-of-human-rights

106. Pérez-Rodríguez F, Guerrero GR, Donoso-Díaz S. Scientific culture in the normative and curriculum documents of Initial Teacher Education in Chile. Cult Stud of Sci Educ. 2024;19:459-79. doi:10.1007/s11422-024-10226-2.

107. Pino-Yancovic M, Ahumada L, DeFerrari J, Correa F, Valenzuela JP. Collaborating inside and outside the school: together overcoming COVID-19 challenges in Chile. Journal of Professional Capital and Community. 2022;7:390-405. doi:10.1108/JPCC-04-2022-0025.

108. Rosenzvaig-Hernandez M. Unmaking the market: exploring the Chilean challenges to de-privatise the educational system. Globalisation, Societies and Education. 2024;22:856-74. doi:10.1080/14767724.2022.2119123.