

<https://doi.org/10.23913/ride.v11i22.951>

Artículos científicos

Estrategias y retos para el seguimiento educativo en primarias ante la contingencia covid-19 en Sonora, México

Strategies and challenges for educational monitoring in elementary schools in the face of the COVID-19 contingency in Sonora, Mexico

Estratégias e desafios para o monitoramento educacional em escolas de ensino fundamental em face da contingência COVID-19 em Sonora, México

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Resumen

La emergencia sanitaria actual y el confinamiento prolongado causados por la covid-19 han trastocado las diversas áreas de la vida, entre ellas, la educativa, lo que ha provocado un reajuste en las estrategias de enseñanza-aprendizaje para la continuidad del ciclo escolar. Por ello, el objetivo general de la presente investigación fue identificar las estrategias educativas empleadas por los docentes de nivel de primaria en el estado de Sonora (México) para el seguimiento escolar ante la pandemia covid-19, así como enunciar los principales retos experimentados en tal proceso. El enfoque de investigación fue cualitativo de tipo exploratorio; los participantes fueron 42 docentes de primarias públicas a quienes se les aplicó un cuestionario *online* en formato de entrevista con preguntas abiertas. Los principales resultados muestran que las plataformas digitales, las videoconferencias y las redes sociales son las más usadas como estrategias de la educación a distancia. En el caso de los estudiantes que no tienen acceso a internet o a equipo de cómputo, los docentes usan llamadas a los padres de familia, seguimiento del programa televisivo *Aprende en casa* y entrega de material impreso. Asimismo, se emplean estrategias tradicionales como el portafolio de evidencias, ejercicios del libro de texto y exámenes. Los principales retos detectados fueron la búsqueda



de vías de comunicación para aquellos estudiantes en situación vulnerable, así como las dificultades con los padres de familia para dar seguimiento a las tareas y ejercicios de sus hijos. Por tanto, se concluye que es necesario trabajar en la capacitación continua para el uso de las TIC, el involucramiento de los padres de familia en el proceso educativo, y por parte del Estado facilitar los recursos tecnológicos a estudiantes y docentes.

Palabras claves: adaptación escolar, educación a distancia, educación básica, estrategias educativas, tecnología educacional.

Abstract

The current health emergency and the prolonged confinement derived by the COVID-19 has disrupted the various areas of life, including education; causing a readjustment in the teaching-learning strategies for the continuity of the school year before the suspension of face-to-face classes. The general objective of the research was to identify the educational strategies used by primary-level teachers for school monitoring in the face of the covid-19 pandemic, as well as to state the main challenges experienced in such a process in the state of Sonora, Mexico. The research approach was qualitative, exploratory, an online questionnaire with open questions was applied to 42 public elementary school teachers. The main results show that among the strategies used it was through the establishment of distance education through digital platforms, video conferences and the use of social networks. In the case of students who did not have access to the Internet or computer equipment, calls were made to parents, monitoring of the television program *Aprende en Casa* and delivery of printed material; as well as continuing with traditional strategies such as the evidence portfolio, textbook exercises, and tests. The main challenges were the search for communication channels for those students in vulnerable situations; as well as the difficulties with the parents in following up on the tasks and exercises of their sons and daughters. It concludes on the importance of continuous training for the use of ICT, the involvement of parents in the educational process and on the part of the State to facilitate technological resources to students and teachers.

Keywords: school adaptation, distance education, basic education, educational strategies, educational technology.

Resumo

A atual emergência de saúde e o confinamento prolongado derivado do COVID-19 perturbou as várias áreas da vida, incluindo a educação; causando um reajuste nas estratégias de ensino-aprendizagem para a continuidade do ano letivo antes da suspensão das aulas presenciais. O objetivo geral da pesquisa foi identificar as estratégias educacionais utilizadas por professores do ensino fundamental para o acompanhamento escolar em face da pandemia covid-19, bem como apresentar os principais desafios enfrentados em tal processo no estado de Sonora, México. A abordagem da pesquisa foi qualitativa, exploratória, um questionário online com questões abertas foi aplicado a 42 professores do ensino fundamental da rede pública. Os principais resultados mostram que dentro das estratégias utilizadas se deu por meio da implantação da educação a distância por meio de plataformas digitais, videoconferências e uso de redes sociais. No caso dos alunos que não tinham acesso à internet ou equipamento de informática, foram realizadas ligações para os pais, acompanhamento do programa de televisão Aprende en Casa e entrega de material impresso; bem como continuar com estratégias tradicionais, como o portfólio de evidências, exercícios de livros e testes. Os principais desafios foram a busca de canais de comunicação para os alunos em situação de vulnerabilidade; bem como as dificuldades dos pais no acompanhamento das tarefas e exercícios dos filhos e filhas. Conclui sobre a importância da formação contínua para o uso das TIC, o envolvimento dos pais no processo educativo e por parte do Estado para viabilizar recursos tecnológicos a alunos e professores.

Palavras-chave: estratégias educacionais, educação a distância, tecnologia educacional, adaptação escolar, educação básica.

Fecha Recepción: Noviembre 2020

Fecha Aceptación: Mayo 2021

Introduction

The changes derived in education due to covid-19 have transformed teaching-learning methods, since pedagogical strategies mediated by technology have had to be implemented to continue with academic activities in a virtual way. An investigation carried out by Baptista, Almazán, Loeza, López and Cárdenas (2020) indicates that basic level teachers in the public sector have used digital tools combined with traditional resources (textbook) for school

monitoring during the pandemic, although at the same time time shows the lack of access to technology in homes.

For its part, Gazca (2020) carried out a non-experimental, exploratory, descriptive and quantitative research with the aim of diagnosing the consequences that covid-19 has had on teaching processes in higher education. The results show that teachers have an institutional platform and technological infrastructure to teach classes, and show that there is an association between the variables age and technological training to teach online classes, which and the age of teachers is related to the effects on health. In addition, the findings reflect the uncertainty generated by the prolongation of the confinement.

On the other hand, the work of Cifuentes (2020) shows that teachers and students have had to adapt quickly to distance education, a situation that demands greater training and a different vision for the incorporation of strategies that capture the attention of the student in a virtual system. Cabero and Valencia (2021) report that confinement has had an accelerated impact on educational systems at all levels by suddenly replacing face-to-face classes with an online modality. This author points out the existing digital gap not only in access to technology, but also in the knowledge and use of it for educational purposes.

As can be inferred from the previous paragraphs, information and communication technologies (ICT) have become essential tools to continue with academic activities; However, there are a series of barriers that limit the accompaniment of students, which are linked to a marked social inequality, lack of technological resources, and little training of teachers and students in the use of ICT (Sánchez et al., 2020). This situation mainly affects vulnerable populations, with low schooling and informal work, who have less possibilities of accessing distance education (Ducoing, 2020).

In Mexico, according to figures from the National Council for the Evaluation of Social Development Policy [Coneval], in 2018 more than 52 million people were in a situation of poverty, 36 million were considered a vulnerable population due to deficiencies and 21 million presented educational lag as an indicator. In fact, according to the National Institute of Statistics and Geography [Inegi] (2020), it is estimated that 76% of the population in Mexico uses the internet in urban areas, while only 47% do so in rural areas. Likewise, while 92% of households have a television, only 56% have internet access, 88% have at least one smart phone and only 44% have a computer. In the specific case of Sonora, it is estimated that 60% of households have internet access and a computer.

This latent reality in Mexico —and in several countries of the world— constitutes a great digital divide to achieve educational goals, hence it is necessary to reflect on distance education schemes and educational strategies used to facilitate the school inclusion of the sectors. most vulnerable.

By virtue of the above, the objective of this work was to identify the main strategies used, as well as the challenges assumed by primary-level teachers in the state of Sonora (Mexico) to continue with their school activities in the midst of the social isolation generated by the covid-19. To do this, the following questions were posed: what educational strategies did the teachers implement for school monitoring, and what were the main educational challenges faced by covid-19?

To answer these questions, the following hypotheses were formulated:

- H1: The implementation of distance education allows school monitoring in the face of confinement.
- H2: Traditional teaching strategies allow the most vulnerable sectors to be included.
- H3: The main educational challenges are the digital gaps of teachers and students.

Conceptual framework

The health emergency generated by covid-19 has caused a readjustment of school activities, which have had to suddenly change towards distance education (Moreno, 2020), understood as the teaching-learning process that uses media for interactivity synchronous (telephone, chat, videoconference, etc.) and asynchronous (platforms, forums, email, etc.) (Heedy and Uribe, 2008).

One of the most outstanding characteristics of distance education is the role that the student must assume in the construction of knowledge of it, which is fostered by the tutoring of teachers through virtual interaction (Chaves, 2017). This modality requires a planning process, selection of resources, educational strategies and forms of communication mediated by ICT (Vela, Ahumada and Guerrero, 2015), which can be defined as the set of technologies that allow the acquisition, production, storage, treatment, communication, registration and presentation of information in the form of voice, images and data (Cacheiro, 2014).

In this regard, Mendoza (2018) adds that ICT offer key tools for the development of digital materials in educational action, which must be designed taking into account the objectives set, as well as the topics and the population to which they are directed (Moreira,

2019). Therefore, Cervantes and Gutiérrez (2020) highlight the importance of promoting the skills required for the use of these technologies (eg, self-regulation of learning), particularly when working with basic education students, since in this way they can reduce the rates of exclusion and school behind.

Anticipating these problems, the Secretariat of Public Education (SEP) of Mexico designed two key strategies to provide academic continuity in the midst of the social isolation generated by covid-19:

Learn at home: It consists of the transmission of television programs to explain topics related to each school grade. In addition to this, it offers the possibility of accessing the portal of said program to consult activities, content and YouTube videos (SEP, 2020a).

Distance education strategy: transformation and innovation for Mexico. This operates from four axes: 1) establishment of the remote platform for the SEP, 2) contents (subjects, with methods, playful, auditory and visual), 3) training and support to teachers, parents, students and officials, and 4) use metrics as input for possible monitoring and evaluation (SEP, 2020b).

Now, regarding didactic strategies, Tobón (2010) defines them as a set of actions that are designed and implemented in an orderly way to achieve the expected learning, while Ferreiro (2012) conceives them as mediation tools between the student and the content provided by the teacher.

However, Díaz-Barriga and Hernández (2010) explain that teaching and learning strategies cannot be grouped in the same definition, since those related to teaching refer to procedures used by the teacher to promote and facilitate the meaningful learning of the students, while those of learning are linked with those used in a personal way by the students to recognize, learn and apply the information received, hence the teachers must handle a variety of activities to attend to these particularities.

Materials and method

The research approach of the present work was qualitative, since emphasis has been placed on people's perspectives and how they are interpreted in a particular context (Vasilachis, 2006). In this regard, Maxwell (2004) states that qualitative research is often used to understand the meanings that actors give to their actions, lives, experiences, processes and situations in which they participate. For their part, Denzin and Lincoln (2012) point out that

in this type of inquiry, the focused multi-method is used to understand and interpret social phenomena in terms of the meaning that people give.

Likewise, it can be stated that this is an exploratory research because it only offers a first approach to the strategies used and the educational challenges that primary-level teachers of the public sector must face in Mexico as a result of the isolation caused by COVID-19. This type of study - according to Hernández, Fernández and Baptista (2010) - attempts to examine a recent topic to detect promising variables that will be detailed in future works. From the qualitative approach, the aim is to study a reduced number of cases extracted from a population segment in order to understand a social fact (Izcara, 2014).

On the other hand, in terms of the sample, it was intentional non-probabilistic for convenience, made up of 42 teachers (78.6% women and 21.4% men) of primary education of the public sector of the state of Sonora (Mexico), with a working seniority that it ranged from 1 to 30 years.

The selection criteria established were the following: a) active elementary teachers in public schools and b) willingness to participate in research and share their experience. Likewise, the identification codes were these: participant teacher number (P #); sex of the participant (H = male; M = female) and educational level taught (G #). Therefore, the code P1_M_G1 would mean participant one, female, first grade.

For data collection, a questionnaire was used—in an interview format with open questions—expressly designed for research purposes. The first section focused on the following data: 1) gender, 2) teaching seniority, 3) educational level of teachers, 4) educational level taught and 5) types of students served during the school year (access to ICT, smart mobile device, without internet or computer access). In the second section, four open questions were presented, which were structured according to the following categories (Table 1):

Tabla 1. Categorías y preguntas de investigación

Categorías	Preguntas
1) Estrategias educativas adaptadas para el trabajo no presencial.	<ul style="list-style-type: none"> • ¿Qué estrategias implementó para la continuidad académica? (Narre su experiencia de acuerdo con el tipo de estudiante).
2) Modalidades de inclusión y seguimiento.	<ul style="list-style-type: none"> • ¿Cuáles fueron las estrategias para el seguimiento de los estudiantes con y sin necesidades educativas especiales? (Narre su experiencia). • ¿Qué modalidades y formas de trabajo se implementaron para la inclusión de los estudiantes?
3) Retos educativos ante la pandemia covid-19.	<ul style="list-style-type: none"> • ¿Cuáles fueron los principales retos educativos experimentados durante la pandemia?

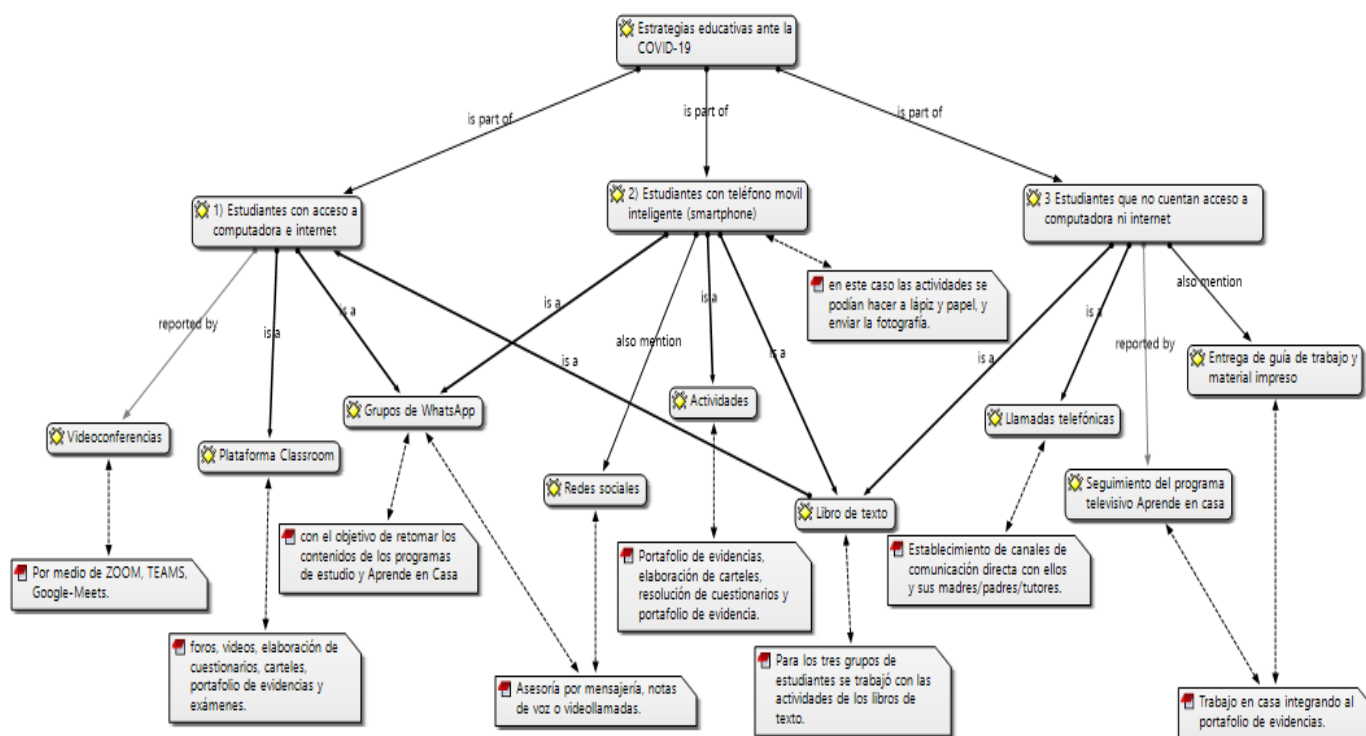
Fuente: Elaboración propia

The data collection took place between May and October 2020 using a Google Forms form. The approximate duration for the responses was 20 minutes. Primary education teachers from the public sector were first contacted by invitation and then their authorization was requested to collaborate in the research (anonymity and confidentiality were guaranteed). The information collected was downloaded from the Google Forms automatic data dump and exported to the Word word processor. Subsequently, the hermeneutical unit was built in the Atlas ti program (version 7), where the information was processed, codes were assigned to the collected testimonies, analysis categories and memos were made with annotations of the saturation of the participants' discourse, and finally families and relationship networks were built.

Results

The results indicate that, in the face of the health contingency generated by covid-19, teachers have used various educational strategies, which depended on the access that students had to ICT. In this sense, it was identified that 1) 60% of the students had a computer and internet, 2) 80% had internet and an intelligent mobile device, and 3) 15% did not have internet or a computer. From these three categories, Figure 1 shows the strategies implemented with each group:

Figura 1. Estrategias educativas implementadas por tipo de estudiantes



Fuente: Elaboración propia

In the above network, it can be seen that for the first group of students (with access to computer and internet), videoconferences were mainly used as a means of synchronous communication (remote in real time) through platforms such as Zoom, Teams and Google-Meets. Likewise, WhatsApp groups were created in order to provide instructions, advice and resume the activities of the television program *Aprende en casa*.

The asynchronous follow-up, on the other hand, was carried out through Classroom, with activities such as forums, YouTube videos, and the preparation of questionnaires. In this regard, the teachers commented:

Until now, classes have been taught via Zoom, where videos, expositions, online exams and expositions by the students have been reproduced (P7_H_G5).

The communication and work that took place with most of the young people was through Classroom, which facilitated contact with the students and through this means work; and I also worked with parents sending activities by WhatsApp for young people who did not have the means (P17_H_G6).

Regarding the second group of students (with a smart mobile phone), WhatsApp groups and instant messaging from social networks such as Facebook were used as a means of synchronous communication. About these strategies the teachers expressed:

In the WhatsApp groups, instruction was given to all the students, it was explained to them by text and audios were sent to answer their parents' doubts, in some cases the mother wrote me directly and made a video call (P16_M_G3).

I had to make Facebook groups because the parents suggested that it was easier to see the files and follow the activities, and to contact them directly (P9_M_G4).

This group of students was also asked to follow the television program *Aprende en casa* and carry out the activities in the textbook, which could be done in pencil and sent in photography by WhatsApp:

The tasks were sent by WhatsApp through the photos of the work done in the book (P8_M_G5).

The communication was given through the cell phones of parents, the activities were sent to them every Sunday to carry out during the week and on Fridays they sent photos of evidence of the work carried out (P20_M_G3).

On the other hand, for the third group of students (those who did not have access to a computer and internet), the teachers handed out printed material and workbooks:

We worked with textbooks, sending the information to a specific place, such as an establishment (P29_H_G4).

I asked them to do review activities and to use their textbooks or line books (P7_M_G1).

I located them at their homes and left copies in the nearest stationery with math and Spanish exercises (P21_M_G2).

Likewise, telephone calls were used as a means of contact:

In these cases, at first it was complicated, first to contact the parents, get the cell phones, and make monitoring calls every week to maintain communication (P18_M_G5).

Finally, the teachers reported that they used the national educational strategy of the television program *Aprende en casa*:

I explained to the parents the importance of watching the TV program Learn at home so that the child could be up to date and gave monitoring by calls (P27_H_G3).

The main suggestion was that they watch the Learn at Home program and make a schedule as if they were going to regular classes (P15_M_G6).

In the category of modalities of inclusion and academic monitoring for students with special educational needs (SEN), the results refer to the provision of distance education:

They have been attended through social networks such as WhatsApp, Zoom and email (P6_H_G3).

Class session is implemented by Zoom with instructions to execute the activities at home (P10_H_G2).

In these cases, in addition, a personalized planning was carried out with the students through cell phone monitoring and explaining the activities of the workbook:

The follow-up was aimed at all students, but the tools that were implemented with children with special needs were personalized attention, giving them one day to attend to said student (P31_H_G3)

A student who was in the process of literacy was sent a booklet appropriate to her literacy level, constant communication was maintained with the parents to give suggestions for activities (P12_M_G1).

An outstanding element in this whole process was the participation of the parents and the follow-up of the support staff:

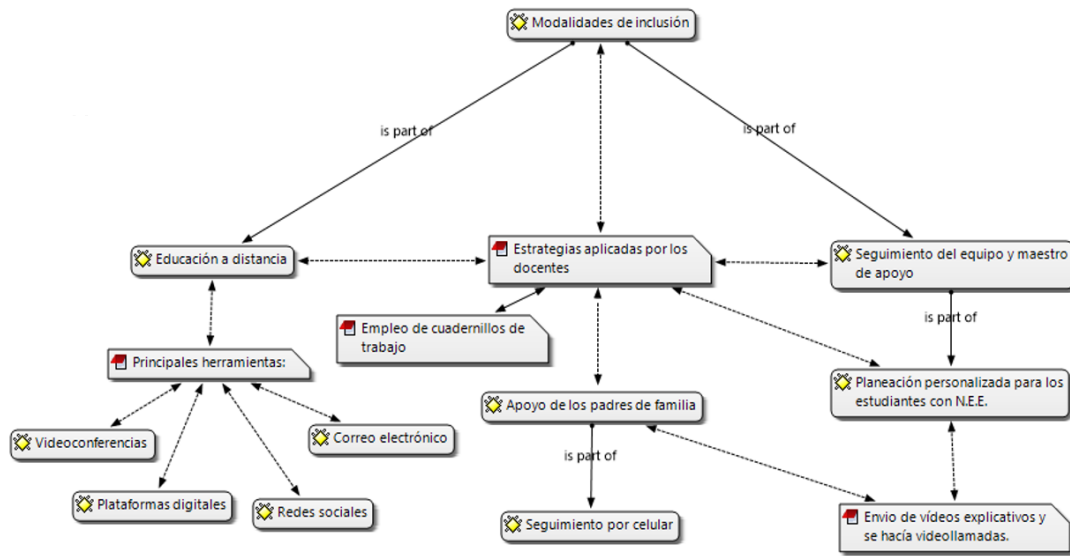
At first it was a bit difficult for them to continue with the programming of the classes at home, but later we worked with a weekly plan that helped them to continue reviewing and learning new topics (P14_M_G5).

I sent them activities appropriate to their needs, as well as videos made by me, of exercises to work fine and gross motor skills and language (P23_M_G1).

I work together with professionals from USAER teacher, psychologist, social worker and support teacher (P4_M_G3).

Figure 2 groups the results on the modalities of inclusion and academic follow-up:

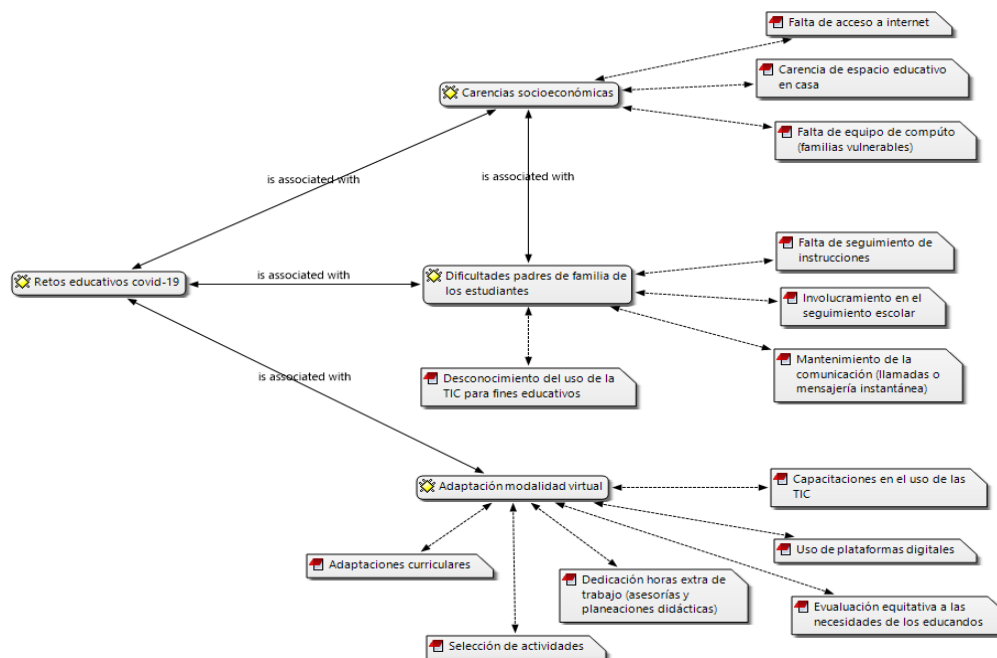
Figura 2. Modalidades de inclusión y seguimiento académico



Fuente: Elaboración propia

In relation to the main educational challenges experienced in the face of the covid-19 contingency, in Figure 3 the results are grouped.

Figura 3. Principales retos educativos experimentados ante la contingencia covid-19
(percepción docente de primaria)



Fuente: Elaboración propia

The following fragments reflect the main challenges according to the perception of teachers:

It is a very difficult and never seen situation, distance education. Few have been the parents who have fulfilled their work, I want to think that there are several factors that limit the father's work. Such is the economic situation they are going through, or the lack of knowledge of how to teach, although many carried out their work to the letter. And they were always willing to help (P15_H_G4).

Working remotely is undoubtedly more complicated, but we were able to adapt to this modality very quickly, not everyone learns at the same time, so we have to return to the content and make adjustments (P7_M_G6).

Discussion

Regarding the first research question formulated in this work (What educational strategies did teachers implement for school monitoring?), The results indicate a transformation of the methodological work, as well as the use of ICT in the teaching-learning process, which was an opportunity to innovate in teaching practice. In this sense, and following the national distance education strategy proposed by the SEP, the teachers relied on platforms such as Google Classroom and on videoconferences provided by Google Meets, among others.

In this sense, the figure of the teacher is materialized in a professional in permanent training who innovates in his practice using instruments and resources that are adjusted to the needs of the students (Muñoz and Lluch, 2020; Zavala, González and Vázquez, 2020). Likewise, Parra, Gómez and Pintor (2015) mention that the use of ICT in the educational process implies a transformation of the methodological work and the training of teachers to face the challenges demanded by today's society.

Regarding hypothesis two (Traditional teaching strategies allow the most vulnerable sectors to be included), it can be noted that a small number of students do not have access to ICT, which generates a disadvantage and a digital divide. Even so, the results demonstrate the teaching vocation and the commitment of the personnel involved, who made curricular adjustments and offered other possibilities for this group of students to continue with their learning process. In fact, the dedication of the teachers stands out, who provided advice even outside the established hours, recorded explanatory videos and delivered printed material for them to advance from their homes. Another relevant point was the support of parents to mediate learning and continue with the activities of the television program *Aprende en casa*, although it should be noted that greater participation is required from them.

For this reason, it is essential that teachers establish a coordinated work with parents, support teachers and directors to facilitate the performance of academic tasks and activities (Cáceres, 2020; García, 2012). In addition, as Burgos, Vázquez, López and Adaos (2021) explain, the possibility of reforming the curriculum should be considered to implement forms of evaluation adjusted to the needs of the students, promoting greater participation of parents in the educational process and promote cooperative learning. Likewise, as Carmona and Morales (2021) suggest, work should be done on the combination of distance and traditional

education through the use of virtual platforms and open television programs, which will offer more educational coverage.

On the other hand, in relation to hypothesis three (The educational challenges are the digital gaps of teachers and students), the findings obtained show that the main challenges are the following: adaptation of strategies to the virtual modality (use of platforms and selection of activities), teacher training in the use of ICT, difficulties with parents and students in the use of ICT, lack of computer equipment and internet (vulnerable families), communication with parents and students.

These results agree with an investigation carried out by Sánchez et al. (2020), where it is evidenced that teachers have logistical and technological problems, as well as digital gaps, which is why they suggest adopting positive attitudes and developing creative and innovative strategies to face the current situation. In this regard, Umaña (2020) lists the main situations that have impacted on the educational area: the lack of technological and didactic resources to implement a distance education model, the abrupt use of ICT and the need to strengthen the development of competencies digital.

Regarding the limitations of this research, at first it was hoped to conduct in-depth interviews with teachers through videoconferences. However, the schedules could not be arranged, so it was decided to ask open questions and send them to be answered online from their homes. The second aspect was that a greater number of participants was expected; However, due to spatial and temporal restrictions, there were difficulties in expanding this number.

Likewise, it is convenient to mention that a type of intentional non-probabilistic sampling was chosen for convenience due to the characteristic of the participating population (public elementary school teachers), which had an excess of work and personal activities in the midst of the pandemic.

Finally, the State must consider the development of strategies so that teachers, students and parents are trained and have access to the use of digital tools, because only in this way can effective and quality distance education be promoted.

Conclusions

The results derived from the research allow us to point out that primary education teachers in Sonora (Mexico) use videoconferences and instant messaging (synchronous communication media), as well as digital platforms (asynchronous resources) to continue with the online development of academic activities amid the health emergency caused by covid-19. Likewise, they also rely on national strategies such as the television program *Aprende en casa* to try to serve the most vulnerable sectors that do not have access to ICT, which shows that social inequalities still persist.

On the other hand, it is worth highlighting the effort, ingenuity and commitment of teachers with their educational mission, because in the midst of difficulties they try to create strategies of various kinds so that all students continue with their learning activities. This was evidenced in the way they combined traditional methods (eg, the use of the textbook) and virtual (eg, videos) so that lower-income students were not excluded or left behind. In addition, in the case of students with special educational needs (SEN), they worked together with the support team and direct communication was continuously maintained with the parents to carry out the activities. Likewise, curricular adjustments, weekly planning were made and the workbook continued to be used.

Regarding the weaknesses found, it is possible to refer to the scarce technological knowledge of the parents to provide advice to their children, which is evidence of the existing digital gaps. Therefore, training strategies in the use of ICT for educational purposes should be promoted, as well as offering materials and technological resources for those most in need.

Regarding the educational challenges derived from the health contingency, three can be grouped: 1) economic, related to social deficiencies and access to ICT by students; 2) relatives, linked to the difficulties of parents for academic monitoring and regulation of learning, and 3) adaptation to virtual work, which has to do with the modification of didactic strategies to be used in digital spaces.

Finally, it should be noted that today more than ever it is necessary to adopt an innovative attitude for the next school year. At this time, unexpected situations are experienced that have caused emotional, economic, educational changes, etc., which must be faced by trained and empathetic teachers who provide support in the emerging needs of the student population.

Future lines of research

For future works it is proposed to study through a quantitative approach the variables 1) initial and continuous teacher training in distance education and 2) educational digital skills of teachers, students and parents. Likewise, investigations exclusively dedicated to students with special educational needs and to the support team during confinement should be carried out. Finally, it is suggested to conduct more in-depth interviews with teachers and include parents and students in the research to collect data from these sectors involved in the educational process.

Acknowledgment

This research was carried out thanks to the support and financing of the Program for Teacher Professional Development (Prodep) (superior type). Secretariat of Public Education (SEP). Project folio: Unison-PTC-297.

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