

## IMPACT OF VIRTUAL EDUCATION ON THE TEACHING AND LEARNING PROCESS OF CHILDREN DURING THE COVID-19 PANDEMIC

IMPACTO DE LA EDUCACIÓN VIRTUAL EN EL PROCESO DE ENSEÑANZA Y  
APRENDIZAJE DE LOS NIÑOS DURANTE LA PANDEMIA DEL COVID-19

IMPACTO DA EDUCAÇÃO VIRTUAL NO PROCESSO DE ENSINO E APRENDIZAGEM DE  
CRIANÇAS DURANTE A PANDEMIA DA COVID-19

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### Abstract

In this research aimed identify the impact of virtual education in the teaching process and children's learning and coping strategies. The survey was carried out online, between June and September 2021, authorized by the Ethics Committee, according to the recommendations cited in the circular letter nº 1/2021-CONEP / CNS / MS, with 111 families residing in Bahia with children under 12 years of age diagnosed with COVID-19 any of the members. The research was approved by CEP(4.749.366). Data were analyzed in the SPSS through single frequency. Development/results: In this research, it was evident that among the 111 respondent families, some were able to follow the classes online, had access to electronic devices, they had good quality wifi, they had a computer and cell phone to monitor classes, had the presence of

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parents available to help, had a reserved environment and some had no difficulties with the electronic device for being old. Through this study it was possible to conclude that the degree of difficulty related to school difficulties is low, which seems to be confirmed by socioeconomic conditions. Therefore, the study was relevant for thinking in policy strategies to help minimize potential negative consequences.

**Keywords:** Covid-19; Kids; Online Teaching; Learning; Coping Strategies.

### Resumen

Este trabajo busca identificar el impacto de la educación virtual en el proceso de enseñanza y aprendizaje de los niños, así como las estrategias para afrontar los retos de ese contexto. Se realizó de forma online, entre junio y septiembre de 2021, según lo autorizado por el Comité de Ética, de acuerdo con las recomendaciones citadas en la Circular nº 1/2021-CONEP/CNS/ MS, con 111 familias residentes en Bahía, con niños menores de 12 años con diagnóstico de COVID-19 en cualquiera de los miembros. La encuesta fue aprobada por el CEP (4.749.366). Los datos se analizaron en el SPSS a través de la frecuencia absoluta. En esta investigación, se evidenció que, entre las 111 familias encuestadas, algunos niños podían seguir las clases en línea, tenían acceso a dispositivos electrónicos, tenían wi-fi de buena calidad, tenían computadora y celular para el seguimiento de las clases, tenían la presencia de padres disponibles para ayudar, tenían un entorno reservado y algunos no tenían dificultades con el dispositivo electrónico porque era antiguo. Aunque la condición socioeconómica de la muestra fue favorable para reducir el impacto de covid-19 en la educación de los escolares en estas familias, hubo informes de dificultades financieras durante este período. A través de este estudio, fue posible concluir que la pandemia tuvo un pequeño impacto en el desarrollo escolar de la muestra estudiada y esto parece ser confirmado por las condiciones socioeconómicas. Ante esto, el estudio fue relevante para pensar en estrategias políticas para ayudar a minimizar posibles consecuencias negativas.

**Palabras clave:** COVID-19; Niño; Educación a Distancia; Aprendizaje; Estrategias de enfrentamiento.

### Resumo

Este trabalho busca identificar o impacto da educação virtual no processo de ensino e aprendizagem das crianças, bem como as estratégias de enfrentamento aos desafios desse contexto. Realizou-se de forma online, entre junho e setembro de 2021, conforme autorizado pelo Comitê de Ética, de acordo com as recomendações citadas na Circular nº 1/2021-CONEP / CNS/MS, com 111 famílias residentes na Bahia, com crianças menores de 12 anos com diagnóstico para COVID-19 em qualquer dos membros. A pesquisa foi aprovada pelo CEP (4.749.366). Os dados foram analisados no SPSS através de frequência absoluta. Nesta pesquisa, evidenciou-se que, dentre as 111 famílias respondentes, algumas crianças conseguiam acompanhar as aulas online, tinham acesso a aparelhos eletrônicos, tinham wi-fi de boa qualidade, tinham computador e celular para o acompanhamento das aulas, tinham a presença de pais disponíveis para ajudar, possuíam um ambiente reservado e alguns não apresentaram dificuldades com o aparelho eletrônico por ser antigo. Embora a condição socioeconômica da amostra tenha sido favorável para a redução do impacto da covid-19 sob a educação de escolares nessas famílias, houve o relato de dificuldades financeiras durante esse período. Por meio deste estudo, foi possível concluir que a pandemia causou impacto pequeno no desenvolvimento escolar da amostra estudada e isso parece ser confirmado pelas condições socioeconômicas. Diante disso, o estudo foi relevante para pensar em estratégias políticas para ajudar a minimizar possíveis consequências negativas.

**Palavras-chave:** Covid-19; Crianças; Ensino Online; Aprendizagem; Estratégias de Enfrentamento.

## Introduction

It is known that social interaction begins in childhood, the connections that children establish in the educational institution they attend are essential, because, in addition to being a place where they spend much of their time, it is an environment that provides interaction with the other. Thus, the relationship that educators establish with each child is important, since it will facilitate cooperation between them (SILVA et al., 2016), and in this context there is the consolidation of socialization (BORSA, 2007). However, this seems to have been modified in the context of the covid-19 pandemic.

With the closure of schools due to the Covid-19 pandemic, education professionals faced the challenge of finding new teaching paths for children and adolescents, since the need for physical distancing had a direct impact on children's learning activities. With schools closed, virtual classes replaced face-to-face classes and the introduction of this new teaching format brought several impacts, compromising, mainly, the socialization and the learning. Such impacts can contribute to the development of disorders such as mental illness and learning reduction (BADIN; PEDERSETTI; SILVA, 2020).

It is known that the adaptation to the environment of virtual classes is necessary, however, the adoption of technological tools for the teaching of children, especially those who are of preschool age, needs caution, because research shows that there may be more losses due to the frequent use of screens in this age group. There are short, medium and long-term effects of this increased exposure to screens, in addition to the tendency to accommodation and sedentary lifestyle, which have a direct implication with the development of chronic non-communicable diseases at older ages and even in the mortality of the adult population (HALL et al., 2021). In addition, mood and sleep changes occur, which lead to disorders such as anxiety, depression and even violent behaviors (DESLANDES; COUTINHO, 2020). It is believed that the social representations that parents have on the subject influence their way of thinking and experiencing new technologies, so far little used for formal education (LUNARDI et al., 2021).

Another aspect that can also interfere with the educational situation of these families is the financial issue, since the low-income situation can further hinder the learning process of children and adolescents. This is because they may not have the appropriate tool to carry out the classes or the parents may not have the resources to afford reinforcement classes, which were in the process of reorganizing in this pandemic context, as well as the difficulty of a quality internet network for the monitoring of the classes. On the other hand, families with higher income may not have such difficulties, since access to online classes is easier and private teachers can be a reality even if remotely. With all these recurring facts, there was the concern for analyzing the context of parents and their difficulties and strategies to deal with the educational issues of their children in times of social distancing.

Given this context, we can see the importance of studies that investigate how the adaptation of families has occurred in the face of the need to carry out synchronous classes for early childhood education. Thus, this work sought to answer the question: What is the impact of the pandemic on the process of teaching and learning in schoolchildren? The objective is, therefore, to identify the impact of virtual education on the process of teaching and learning of children and the family strategies for coping.

## Method

An exploratory study was prepared with a quantitative, cross-sectional, non-experimental, non-probabilistic and self-reported approach. The study included families living in Bahia with children under 12 years of age who had a positive diagnosis of COVID-19 in a family member. The survey was conducted online, whose collection took place between June and September 2021, through Google Forms, with dissemination through technology social networks.

The research was approved by the Research Ethics Committee (CEP), according to the Certificate of Presentation of Ethical Appreciation (CAAE) 4,749,366. After authorization from the Research Ethics Committee to carry out the project, in

accordance with the recommendations cited in Circular No. 1/2021, of the National Research Ethics Committee (CONEP) and the National Health Council (CNS), the research invitation was sent on the following digital channels: WhatsApp and Instagram, regarding the guidelines for research procedures at any stage of the virtual environment, to attract the largest number of participants.

In case you agree to participate in the survey, a link was sent containing a form allocated on the Google Forms platform, and the individual must agree to the free and informed consent form (TCLE) prepared for this survey. It is reiterated, in this sense, that the study meets the CNS Resolution of the CEP, N° 466/2012, and CONEP. The semi-structured questionnaire was developed by the researchers themselves, containing 6 (six) questions involving schooling. The results were analyzed using the Statistical Package for the Social Sciences (SPSS), with calculation of absolute and relative frequency with the data presented in table form.

## Results

The sample was composed of 111 Bahian families, in which children from 8 to 10 years old predominate, totaling 42 (37.8%); 58 families (52.3%) reside in Salvador or metropolitan region. Regarding its characterization, 48 families have one child (43.2%) and 52 (46.8%) have two children; the highest frequency is 3 to 4 residents per residence, totaling 95 families (85.5%). Among the respondents, 92 (82.9%) reported living in their own home and 61 (55%) said they had an electrical network, as can be seen in table 1.

**TABLE 1.** Characterization of the sociodemographic profile of the 111 families living in Bahia, Brazil in 2021.

VARIABLES	N = 111
<b>Children's Age</b>	<b>n (%)</b>
From 0 to 1 year 11 months and 29 days	15 (13,5%)
From 2 to 4 years 11 months and 29 days	33 (29,7%)
From 5 to 7 years 11 months and 29 days	23 (20,7%)
From 8 to 10 years 11 months and 29 days	31 (27,9%)
From 11 to 12 years	9 (8,1%)
<b>Region where you live</b>	<b>n (%)</b>
Salvador and Metropolitan Region	58 (52,3%)
Recôncavo Baiano	25 (22,5%)
Other regions of Bahia	21 (18,9%)
Did not answer	7 (6,3%)

<b>Number of children</b>	<b>n (%)</b>
1	48 (43,2%)
2	52 (46,8%)
Above de 3	11 (9,9%)
<b>Number of residents in residence</b>	<b>n (%)</b>
Did not answer	1 (0,9%)
2	3 (2,7%)
3	48 (43,2%)
4	47 (42,3%)
5 or more	12 (10,8%)
<b>Rented house</b>	<b>n (%)</b>
No	92 (82,9%)
<b>Number of rooms in house</b>	<b>n (%)</b>
Did not answer	1 (0,9%)
Up to 4	31 (27,9%)
5 or more	79 (71,2%)
<b>Light network</b>	<b>n (%)</b>
Yes	61 (55%)
<b>Sewage network</b>	<b>n (%)</b>
Did not answer	63 (56,8%)
<b>Gender of responder</b>	<b>n (%)</b>
Did not answer	13 (11,7%)
Female	83 (74,8%)
Male	15 (13,5%)
<b>Race/Color of the responder</b>	<b>n (%)</b>
Yellow	2 (1,8%)
White	25 (22,5%)
Brown	54 (48,6%)
Black	30 (27,0%)
<b>Marital Status</b>	<b>n (%)</b>
Married	82 (73,9%)
Divorced	4 (3,6%)
Single	17 (15,3%)
Other	8 (7,2%)
<b>Respondent education</b>	<b>n (%)</b>
Up to High School	33 (29,7%)
Higher Education and/or Post-Graduation	78 (70,2%)
<b>Family Income</b>	<b>n (%)</b>
Up to 3 minimum wages	54 (48,6%)
From 3 to 5 minimum wages	16 (14,4%)
Above 5 minimum wages	41 (36,9%)
<b>Felt Financial Difficulty in the Pandemic</b>	<b>n (%)</b>
Yes	72 (64,9%)
No	39 (35,1%)

Source: Own Authorship, 2021.

Table 1 also shows that, in the majority, the respondents of this research were 83 women (74.8%); 54 brown (48.6%); 82 married (73.9%); 38 (34.2%) claimed to have completed graduate school and 23 (20.7%) complete high school. The average family income was 1 to 3 minimum wages in 46 responses (41.4%), but 26 (23.4%) had income above 8 minimum wages. Most of them deny a history of family history for the main chronic diseases.

Regarding the activities carried out by the children during the day, outside the class space, 89 children (80.2%) use electronic devices for other purposes; 70 (63.1%) play and 70 (63.1%) have not maintained contact with friends, as shown in table 2.

**TABLE 2.** Activities carried out by children, outside the classroom, during the pandemic in the capital of Bahia in 2020 and 2021.

VARIABLES	N (%)
<b>Use of electronics</b>	<b>n (%)</b>
Yes	89 (80,2%)
No	22 (19,8%)
<b>Sleep in the afternoon</b>	<b>n (%)</b>
Yes	16 (14,4%)
No	95 (85,6%)
<b>Study</b>	<b>n (%)</b>
Yes	19 (17,1%)
No	92 (82,9%)
<b>Stay in the room</b>	<b>n (%)</b>
Yes	21 (18,9%)
No	90 (81,1%)
<b>Play</b>	<b>n (%)</b>
Yes	70 (63,1%)
No	41 (36,9%)
<b>Have kept in touch with friends</b>	<b>n (%)</b>
Yes	41 (36,9%)
No	70 (63,1%)

Source: Own Authoship, 2021

About the conditions for monitoring remote classes, 67 minors (60.4%) can follow classes online; 84 (75.7%) have electronic devices to attend classes. Among the difficulties presented, 32 (28%) reported the occurrence of problems such as the absence of a Wi-Fi network; 48 (43.2%) reported difficulties due to the absence of supervision of an adult and 22 (19.8%) reported the absence of an environment reserved for monitoring classes. Among the respondents, 45 (40.5%) expressed that their children like remote classes sometimes, although 76 parents consider the possibility of a reduction in income, equivalent to 68.5% of the sample (Table 3). Regarding family care during classes, 78 (70.3%) assist in the activities sent and 23 guardians (20.7%) moved away from their work to accompany the child (Table 4).

**TABLE 3.** Difficulties presented at the time of the study during the covid-19 pandemic in Bahia, Brazil in 2021.

VARIABLES	N (%)
The child can keep up with classes	n (%)
Yes	67 (60,4%)
The child can keep up with classes	n (%)
Yes	84 (75,7%)
Difficulties with no WiFi	n (%)
No	79 (71,2%)
Difficulties with lack of available electronic devices	n (%)
No	93 (83,8%)
Difficulties with no adult supervision	n (%)
No	63 (56,8%)
Difficulties with the absence of an environment reserved for the moment of class	n (%)
No	89 (80,2%)
Difficulty using old equipment or equipment that does not support the class programs	n (%)
No	99 (89,2%)
Child enjoys online classes	n (%)
Sometimes	45 (40,5%)
Less performance was noted in classes	n (%)
Yes	76 (68,5%)

Source: Own Authorship, 2021

**TABLE 4.** Strategies for coping with the difficulties shown in Table 3, during the monitoring of remote classes during the pandemic period.

VARIABLES	N (%)
Parents help with school activities	n (%)
Yes	78 (70,3%)
No	33 (29,7%)
Father or mother took time off from work to accompany their child	n (%)
Yes	23 (20,7%)
No	88 (79,3%)
Bought a new electronic device	n (%)
Yes	19 (17,1%)
No	92 (82,9%)
Improved internet speed	n (%)
Yes	26 (23,4%)
No	85 (76,6%)

Source: Own Authorship, 2021

## Discussion

This research made it possible to identify a portion of the Bahian population that had a family member affected by covid-19 and whose impact on the early childhood education of their children was reduced, which makes us believe we are linked to socioeconomic conditions. This reality resulted in a reduction of difficulties for the adaptation of their children in relation to learning issues in remote learning. In the sample studied, it is considered that these results are due, mainly, to the socioeconomic profile of the families participating in the study.



Among the social issues that are considered relevant to the definition of the socioeconomic condition of families, two are considered important: education and income. In the sample studied, for the most part, there are people with higher education and post graduation, making up almost three quarters of the sample. It is understood that the level of education makes it possible for such people to have/find jobs that allow a more stable financial condition. This reality is corroborated with a study on higher education in which it is said that such education provides better wages, as well as better quality of life, since it has been proven that a person with a degree receives more than double the salary compared to those who do not. The socioeconomic condition also interferes with the cognitive development of students, since it was necessary to have electronic devices, among other aspects, according to the report of experience of teachers during the pandemic period (FIGUEREDO; MACÊDO, 2022).

In the sample studied, it can be seen a little more than half receiving above two minimum wages, which seems to contrast with the average for the state of Bahia registered by the Brazilian Institute of Geography and Statistics (IBGE), whose monthly income is around R\$965.00. Research carried out by IBGE revealed that during the pandemic the average income of Brazilians was less than a minimum wage, among the states living in a situation of financial inferiority, Bahia had its average income at R\$965, being the tenth national state in a situation of financial decline (ANDRADE, 2021). Although in our sample we have evidenced a favorable and above-average socioeconomic condition, identified not only for the State, but also in the country, it was reported by the families the existence of financial difficulties in this period. Despite this, it is considered that the socioeconomic condition of the families studied may have contributed to the quality of life and coping with the educational reality during the pandemic.

Another prominent aspect of this study is that, although most respondents declared themselves black people (black and brown), making up more than half of the sample, the racial issue was not associated with a higher poverty rate, which may be contrasting with the national poverty profile. Recent data reveal that black people are the ones who have the greatest socioeconomic difficulty in Brazil and it is believed that this was not reinforced in this research due to the need for a larger sample (IBGE, 2019).

Given the socioeconomic reality that seems to have positively influenced these families to cope with the new educational context in the face of covid-19, the results demonstrate a low degree of difficulty in relation to school difficulties, this seems to be corroborated by the research carried out in the city of João Câmara/RN, in an investigation aimed at children, whose results indicate that there are several factors that can influence the good cognitive. Cannot pay attention to all aspects of the child's development, which can cause poor school performance due to lack of resources that provide more meaningful learning (GOMES, 2018).

Another aspect that seems to have influenced this scenario is that the routine of children and family members changed during the pandemic, with more free time directed to the access of screens. Spending more time at home, with little or no interaction with the external environment caused other elements to occupy this space and the use of electronic devices was one of them. Studies show that, during the pandemic, the use of electronic devices and screen time increased, as it has become a possible means of reducing the impact of social isolation and maintaining relationships and interactions with family, colleagues and friends through social networks, in addition to providing easily accessible recreational resources (JÚNIOR et al., 2020).

Despite the ease of access of resources through electronic devices, evidence shows that a greater amount of time in use of the screen was negatively associated with children's language, while better quality of use of the screen, that is, educational programs and with the presence of caregivers, were positively associated with children's language skills. Experts advise that the use of screens should occur in familiar places in the house and the families should create healthy rules for their use, in addition to safety rules such as child-appropriate passwords and filters (MADIGAN et al., 2020; SBP, 2021).

In addition, authors bring that digital is part of culture, and under this demand it is available to promote imagination and creation of new sensitivities in the field of art-education. However, researchers claim that the development and freedom of expression of the child should be considered in a school environment, which will provide

cooperation, development of emotional and cognitive intelligence, affectivity, among other benefits of the non- Harmful use of the computer, when in a school environment (MILBRADT; CANNAVÔ, 2021).

Although the use of electronic devices can favor interaction with other people, thus reducing the impact of social isolation, most of the children in the study have not maintained contact with friends and this can have implications arising from the lack of sociability. Through socialization, children learn to share playful experiences, to cooperate, to live with differences, face challenges and decisions, wait their turn, control impulses and manage conflicts, which are significant learnings for human development. The absence of moments in which the child interacts and experiences these processes of sociability can lead to psychological damage, difficulty in living with other children, in addition to the fact that the interaction through the screen does not supply the lack of physical contact and affection (LINHARES; ENUMO, 2020).

However, although the study sample indicated that children have not had contact with their friends, especially in person, the results also indicated that most children play in their free time. Generally, for infants, this is their favorite activity, regardless of the environment. It is through play that the child achieves knowledge and expands the interaction, whenever possible, with other children, improving the ways they deal with their expectations and also frustrations, which teaches them to live in a group (BISHOP; BISHOP; SALAZAR, 2020).

Also in relation to technology, it is noteworthy that even if most of the sample has electronic devices to attend classes, only 60.4% follows virtual school meetings regularly. This may be due to the fact that children and adolescents resisted adopting a routine, because they thought they were on vacation, since they were at home all the time, most of the time, living a situation that generates stress for them and their parents. The parents sometimes felt powerless in the face of the picture, especially with regard to the lack, often, of a specific space for students to perform the tasks and participate in the virtual interactions in a private way, given that the family was at home all the time (ALVES, 2020).

It was possible to see that the children of the responding families, for the most part, were able to participate in the classes without difficulties related to access to available electronic devices or wi-fi network. In short, the children had adults with availability for supervision, these being those responsible or someone from outside. In addition, there was an environment and equipment suitable for families, such factors are linked to the financial profile of the families, since they are in a position of privilege. A study done on education before and after the pandemic, it was exposed that internet connectivity was a divisive factor, contributing to the increase in inequality. A study carried out by the regions of Brazil brings Brazilian teachers reporting that the educational deficit exposed during the pandemic was a reflection of national education policies (ROSAS, 2021).

Among the respondents, there were only complaints related to school performance, since almost two-thirds observed a decrease in the grades of the children, even if there were factors conducive to a good education, such as internet access, place reserved for children to follow the classes, etc. It is noteworthy, in this context, that a primary aspect is the need to know how to interpret technological language and understand how technologies can directly affect the perceptions and actions of children (MILBRADT; CANNAVÔ, 2021). The basics of teaching-learning is to cover the entire individual context, so that human exclusions and non-understanding of the teaching-learning process are avoided. Another need is to know the virtual/digital environments so that the promotion of classes is more interactive (MARQUES; SANTOS, 2021).

Although this research has shown that there were not many difficulties in relation to the school routine of the children, it is important to know the coping strategies, because the mothers of the students report that they have received support in relation to the increase in the speed of the internet, some bought a new device, some parents got a leave of absence from work to work in the home office, which consequently resulted with Many parents, of a privileged class, are working in a home office, therefore, in addition to a more systematic and continuous monitoring of the remote activities that their children perform and that sometimes need the supervision

of an adult, they need to take care of their own professional needs. This scenario ends up generating an exhaustion of parents, teachers and students (IDOETA, 2020).

Objective 4, quality education, of the United Nations (UN), referring to the 17 sustainable development objectives (SDGs), defines its pretensions for global education, in order to ensure a non-exclusive, quality and equitable education to provide learning for all people, with children being the first individuals cited in such objectives. This proposal is intended to have its compliance by the year 2030, however, with the arrival of the covid-19 pandemic, there was a delay in obtaining its realization in providing primary and secondary education (UN, 2015). It should be noted that the National Policy on Early Childhood Education determines that teachers have the right to continuing education (BRAZIL, 1996). In short, it is understood that remote education during the pandemic evidenced the need for a probable reinforcement in order to repair the impacts caused by the first 3 (three) years of the pandemic, in which remote education was in greater evidence.

In Brazil, the pandemic consequences were diverse, all social groups suffered some negative impact. Reduced school performance and decreased family financial income were the points highlighted within the context of the families participating in the research, making studies with a larger cut necessary.

The main limitations found in the development of this study are linked to the sample search method, since the COVID-19 pandemic made it impossible to move and direct contact between researchers and the population studied. The high dissemination of fake news caused fear in the participants when they received a research link through an unknown number. Thus, it is believed that the development of the research supported by the circular letter showed weaknesses, because the understanding of what it was about was not full and doubts could not be solved..

## Final Considerations

This research presented the impact of the pandemic on the process of teaching and learning in schoolchildren and its process of adaptation to the online education of children during the COVID-19 pandemic.

In the study sample, it was noticed that the socioeconomic condition proved to be a facilitator in this process. However, a reduction in school performance was recorded by family members, evidencing the need for new studies that intersectally evaluate other impacts of the covid-19 pandemic on children who were in remote education during this period, as well as how current public policies can contribute to the reconquest of what was lost in teaching-learning during the pandemic context.

In addition, it is worth mentioning that the present study encountered difficulties regarding the reach of Bahian families by digital means, since there are currently several virtual dangers. Therefore, people are afraid to open links, either by WhatsApp, Instagram or any other means of communication that goes through the virtual.

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