

School Management in the Teaching-Learning Process in the Context of Covid-19

Renata Guimarães Siqueira Fernandes^I

Amanda Soares Zambelli Ferretti^{II}

^IFucape Business School, Vitória/ES – Brazil

^{II}Faculdade de Ensino Superior de Linhares (Faceli), Linhares/ES – Brazil

ABSTRACT – School Management in the Teaching-Learning Process in the Context of Covid-19. This study discusses the impacts of the Covid-19 pandemic on Basic Education teaching and learning in Brazil. We conducted qualitative research using semi-structured interviews with the principals of public schools in the municipality of Cachoeiro de Itapemirim, in the south of the Brazilian state of Espírito Santo. The results showed that, before the pandemic, public schools faced precariousness due to malfunctioning equipment. During the pandemic, school employees adapted to online classes and other activities with difficulty, as teachers had problems learning how to use Digital Information and Communication Technologies (DCITs). After the pandemic, improvements were noted obtaining equipment and internet quality, but there were losses learning levels and reported mental health.

Keywords: Digital Information and Communication Technologies. Education. School Management. Covid-19. Teaching and Learning.

RESUMO – Gestão Escolar no Processo Ensino-Aprendizagem no Contexto da Covid-19. Este estudo discutiu os impactos no ensino-aprendizagem na Educação Básica no contexto da Covid-19. Foi realizada uma pesquisa qualitativa com entrevistas semiestruturadas com diretores de escolas públicas do município de Cachoeiro de Itapemirim, no sul do Espírito Santo. Os resultados demonstraram que antes da pandemia, escolas públicas enfrentavam precarização pelo mau funcionamento de equipamentos. Na pandemia, funcionários se adaptaram para aulas on-line e demais atividades, com dificuldade entre os professores para aprender o uso de Tecnologias Digitais de Informação e Comunicação (TDICs). Após a pandemia, notou-se melhorias na obtenção de equipamentos e qualidade de internet, porém houve prejuízo na aprendizagem e na saúde mental.

Palavras-chave: Tecnologias Digitais de Informação e Comunicação. Educação. Gestão Escolar. Covid-19. Ensino e Aprendizagem.

Introduction

The Covid-19 pandemic, which began in the province of Wuhan, China, in late 2019 and spread around the globe in 2020, brought consequences for Brazil, as it did for all countries of the world. Covid-19 is a novel disease caused by the SARS-CoV-2 virus, with transmission usually occurring through the air or through contact with the secretions of infected people (Klussman et al., 2022). During the outbreak, transmission spread globally, causing a pandemic, since it is an airborne disease transmitted through the respiratory tract, according to the World Health Organization (Klussman et al., 2022).

The rapid spread, and lack of a vaccine or known treatment, led to the implementation of isolation policies as a way to reduce transmission and contagion levels (Maia; Dias, 2020). As a consequence of isolation, there was a change in the logic of relationships between people, which triggered a new relationship model based on distance and virtual communications (Aroles; Küpers, 2022).

In this scenario, a new order emerged in the educational process, created with the aim of reducing the impacts of the pandemic on daily school life. In March 2020, the Brazilian Ministry of Education¹ authorized the replacement of in-person classes with digital classes—that is, with the use of Digital Information and Communication Technologies (DICTs), which do not require students and teachers to be physically in the same space. Such technologies were already being used; however, due to social isolation, DICTs were brought to the forefront in 2020 to deal with the effects of the pandemic. This ordinance changed the entire federal education network, as well as private universities and colleges, setting a precedent for state and municipal education systems to follow the same path. This measure was taken indefinitely, since the Covid-19 pandemic was not expected to end for a considerable amount of time (Brazil, 2020).

Given the impact the pandemic generated on the national educational scenario, it was also necessary to think about structuring teaching processes and mechanisms so that classes could continue to be offered to students (Pires, 2021), guaranteeing the constitutional right to education (Brazil, 1988). With social distancing and, consequently, the suspension of face-to-face classes, the remote teaching model emerged on an emergency basis introduced with a temporary proposal in the form of distance learning or *online teaching* (Ferri; Grifoni; Guzzo, 2020; Klussman et al., 2022).

Despite the need to use technologies for remote teaching during the pandemic, studies on the use of digital tools to advance the teaching-learning process are not new. Previous studies on the use of ICTs to assist students tend to present the phenomenon with Distance Learning (EAD) in mind. Zonta and Pilan (2019), for example, applied the *Computer-Supported Learning (CSLE)* technology *Collaborative Learning* (CSCL) as an effective tool that trained students in distance learning, which has become an alternative for the growth of undergraduate courses in Brazil (Silva, 2019).

During this period, in which pedagogical work was carried out remotely, Basic Education followed the technological model adopted for Higher Education while failing to consider its particularities (Abumalloh et al., 2021). Thus, given the context presented, the following research question was identified: what are the impacts on the teaching-learning process with the use of technologies in the context of Covid-19? Thus, this study aims to understand the impacts on the teaching-learning process for Basic Education with the use of technologies in the context of Covid-19.

To meet the proposed objective, a qualitative study was conducted with administrators of municipal public schools of Cachoeiro de Itapemirim (ES). The city is located in the south of the Brazilian state of Espírito Santo, and the city's name was influenced by the presence of the Itapemirim River that runs through the region, in addition to the presence of waterfalls, which provide economic and urban development based on the river. Cachoeiro de Itapemirim is the fifth municipality in terms of population in Espírito Santo, with an HDI of 0.746 and 175,784 inhabitants, according to the last census. It is the largest producer of ornamental rocks in Espírito Santo and second in exports. The main economic activities of the municipality are concentrated in the agricultural sector, agro-industrial products, and exportation of marble and granite.

According to the INEP School Catalog, there are 104 active public schools in Cachoeiro de Itapemirim, of which there are approximately: 36 Early Childhood Education schools; 31 Elementary Schools; 18 Early Childhood and Elementary Education Schools; 3 Elementary Education and High Schools; 8 Elementary Education, High School and Vocational Education schools; 5 Elementary Education and Young Adult Education schools; and lastly, 3 High School, Vocational Education and Young Adult Education schools (Brazil, 2023). Data collection took place through interviews with a semi-structured script, in order to present how the actions of managers can contribute to more inclusive, accessible, and relevant learning for students, in the search for a management process developed with the use of technologies.

The results demonstrated that school management played a fundamental role in ensuring the continuity of the teaching and learning process for students, ensuring not only access to pedagogical activities, but also to food and psychological support. However, the use of ICTs during the pandemic brought negative consequences in terms of a decrease or delay in students' learning, and in most situations, the delay in learning does not occur due to a lack of cognitive capacity on the part of students, but for various reasons, such as the lack of access to technological resources and the lack of digital technological proficiency among both students and teachers.

In theoretical terms, this study contributed to expanding the literature's view on the use of digital technologies in the educational environment in the context of Covid-19, going beyond the focus on the teacher's performance (Cifuentes-Faura, 2020). Secondly, it sought to

present a view more aligned with the understanding of measures that are essential within school management models, which must be consistent with the demand for *online* professionals' performance (Ferri; Grifoni; Guzzo, 2020).

New uses of technologies in the school context

Educational provision through the use of technology tends to be naturally more modern and dynamic, but runs the risk of disregarding the fact that the usability of these technologies only makes sense based on a management process that adequately explores all the needs and demands of this scenario (Maia; Dias, 2020). The way in which education is inserted into the social context directly contributes to the formation of an individual as a citizen and, at the same time, to their participation in the creation of society (Cifuentes-Faura, 2020). As technologies are inserted into the educational environment, it is necessary to understand that people's social condition reflects the education offered to the community in general (Rios; Pimentel, 2007).

Common sense tends to point out the possible inefficiency of the online education model, given the difficulty part of the Brazilian population has both in accessing and using technological tools (Maia; Dias, 2020). It is therefore worth inferring that the relevance of school management in this scenario is vital to promoting good academic performance by students, given that one of the factors lacking in this case is the educational condition that facilitates student learning outside the classroom, a fact aggravated by the lack of professional qualifications and materials that support this learning process (Antonio et al., 2021).

According to Mardini and Mah'd (2022), the pandemic forced students and teachers to learn to continually use digital tools to communicate remotely as well as receive information about events related to the school environment. In education, teachers who did not yet have full access needed to quickly learn how to use digital platforms to post activities, scripts, assessments, and teach content (Franco; Franco; Longhi, 2022).

Through a digital survey applied in countries such as France, Qatar, Tunisia, Oman and the United Kingdom, the Microsoft Teams and Zoom platforms were the most used in the academic environment of higher education, due to the ease of access given by ability to register and access via email or login and password, respectively (Mardini; Mah'd, 2022).

Ferri, Grifoni and Guzzo (2020) point to the use of personal devices integrated into some institutions, such as the use of television, radio, educational game simulators, and printed teaching resources. New Zealand, Australia, and Portugal use such combined resources mainly for students who do not have access to the internet, as the school makes contact and delivers materials through partnerships with government carriers (Chen et al., 2022).

Online digital platforms allowed students and teachers to carry out their activities with greater autonomy. However, the lack of proximity and the difficulty of interaction between student and teacher were factors that hindered teaching, especially in practical work which requires greater interaction between peers, as well as making the in the teacher-student relationship more difficult (Ferri; Grifoni; Guzzo, 2020; Mardini; Mah'd, 2022). In this sense, Cifuentes-Faura (2020) points out that adapting quickly to remote teaching and the use of platforms is a great challenge, including for the effectiveness of the use of these resources. Thus, it is necessary to reconsider the teaching methodology, adequate preparation, and training of the teacher, in addition to the inclusive view of students with greater difficulties or fewer resources to study remotely (Franco; Franco; Longhi, 2022).

Additionally, in European Union countries such as Hungary, Estonia, and Italy, strategies were organized to overcome such difficulties, such as technological assistance with installation and guidance for parents and children with access difficulties, in addition to the dissemination of a platform for free use limited to a few months and an online community for teachers to help both families and each other (Chen et al., 2022).

In Italy, on the other hand, there was an initiative to carry out campaigns to collect technological devices donated to students who could not afford them. The government allocated funds to encourage schools to use e-learning platforms and other funds began to provide loans to students. Estonia, on the other hand, used the strategy of digitizing materials to send to students (Ferri; Grifoni; Guzzo, 2020).

There has been a global increase in Internet usage which has led to overconsumption and difficulties in receiving support from access provider companies. As a result, several countries have experienced drastic connection outages, broadband delays, and network inconsistencies, making it difficult to broadcast video conferences and conduct online assessments on websites and/or platforms, which has hindered the student learning process (Leal, 2022).

Covid-19 and its impacts on education

The Covid-19 pandemic has had a critical impact on education. When initially considering the factors related to the need to continue the educational offering, it is possible to mention the fact that, as the need for social isolation intensified, there was a systematic increase in the need to ensure that, even remotely, the educational offering was continued (Aroles; Küpers, 2022).

The critical aspect does not necessarily refer to the performance of the manager, but to the difficulties in accessing the supply of teaching support material and adequate structure, as well as teaching materials that were in accordance with available technologies. The precariousness of the structure of the teaching-learning process was largely due to the rigidity of the teacher, due to a lack of technological experience, and the troubles in capturing a students attention online, not due

to the teaching-learning process itself. Teachers were let to only ensure that at least a minimum of the curriculum and the fulfillment of the workload were carried out (Wang; Liu; Parker, 2020).

It is worth mentioning that the manager needed strong pedagogical skills in order to assure that the student absorbs the best of what is being passed on (Becker, 2022). The school manager and his/her duties play an important role, whether to ensure an educational space appropriate to the teaching-learning process, or in the performance and learning of students (Assis; Marconi, 2021; Pereda et al., 2019).

For Júnior (2022), despite the need for reconstruction, and changes in the educational scenario, education offered through the use of technological resources managed to fulfill its role within the context of the pandemic, even considering the difficulties faced with regard to the availability of resources and lack of access by a large part of students to the necessary resources (Júnior, 2022).

The Covid-19 pandemic and the new teaching model

The new teaching model necessitated by the COVID-19 pandemic constituted a change connected to the need to ensure that education reaches students through the use of technologies (Litto, 2022). It is, however, worth highlighting that the use of technologies is not limited to the act of making it possible to continue with the school calendar and thus end the school year (Morin, 2002).

The new teaching model that is being discussed aims to engage and optimize resources, with the focus on making the technology used within an educational model meaningful, efficient, and ideally fitting within the structured teaching model (Stahl; Koschmann; Suthers, 2006).

In total, the Ministry of Education published nine opinions and one resolution in 2020, guiding public and private institutions in the online teaching modality and suspension of in-person activities. The first such guidance was an opinion on Covid-19, CNE/CP No. 5/2020 on April 28. This opinion dealt with the restructuring of the school calendar due to the indefinite interruption of in-person classes, considering the carrying out of non-in-person activities to ensure the application of the minimum school workload, that is, so that students do not lose the school year (Brazil, 2020b).

On June 8, 2020, this opinion was re-examined through CNE/CP No. 9/2020. This is the Re-examination of Opinion CNE/CP No. 5/2020, with a reflection on the suspension of in-person classes and the structural inequality inherent in society which further aggravates the pandemic context, such as low-income students who do not have access to non-face-to-face activities. In addition, this opinion changed the National High School Exam (ENEM) from in-person to online (Brazil 2020c).

CNE/CP opinion No. 9/2020 concluded with a request that the Education Council clarify assessments and exams in a pandemic scenario, so that they would not harm students who took the ENEM national exam. Subsequently, on July 7, CNE/CP opinion No. 11/2020, CNE/CES opinion No. 498/2020, dated August 6, and, on October 6,

CNE/CP opinion No. 15/2020 launched the new guidelines for education in light of the state of emergency decree (Brazil, 2020c; 2020d; 2020e; 2020f).

The new teaching model of the institutions sought to follow the development of skills and domains of the National Common Curricular Base (BNCC), in addition to seeking solutions to problems in a collaborative regime between institutions and education networks. The importance of training teaching staff in the use of technologies and enabling free internet access for schools in the municipal, state, or federal education network were also discussed. The opinions recognize the importance of using technologies available before the pandemic, such as television, radio, educational blogs, and digital platforms (Brasil, 2020d; 2020e; 2020f).

In December, CNE/CP opinion no. 19/2020, of December 8, 2020, and CNE/CP resolutions no. 2, of December 10, and CNE/CES no. 1, of December 29, 2020, point to the guidance to wait for the decrees of the health surveillance agencies for the return of in-person classes and the deadline that the institutions have to implement the new National Curricular Guidelines (DCNs) resulting from the public calamity (Brasil, 2020g; 2020h; 2020i).

In this sense, it is important to highlight that, with the pandemic, schools' challenges of having to adapt to an uncertain scenario where adaptation to needed to occur quickly led to the conception of a new way of providing education, so that it could continue to be offered in a new dynamic and with the help of efficient tools aligned with the needs of students (Litto, 2022).

Thus, since technologies began to influence human behavior, the discussion has arisen about how to adapt the educational model in place in order to meet the needs of everyone who goes through this process (Ortega-Navas, 2017).

Education cannot be separated from the cultural and social context, as the interactions and contacts that make the learning process possible are not easily replaced (Nogueira, 2021). Given this perspective of change, the importance of the direct participation of the manager in terms of pedagogical management becomes evident, seeking, given the context in which education is placed in the midst of the pandemic, to ensure the teaching-learning process and, therefore, providing efficient pedagogical management (Leal, 2022).

In the description of the role of the pedagogical manager within the school environment, it is understood that pedagogical management must be practiced by all areas of school management, and its primary objective is to promote learning directly at school and the training of students (Litto, 2022).

Pedagogical management focuses on systematic action in an intentional manner, to offer conditions in the student's learning process, as well as for the development of their social and personal skills and competencies necessary for coexistence in society and entering the job market (Ceretta; Jesus, 2018).

With the introduction of hybrid teaching in schools, there were many challenges in organizing educational work: teachers' lack of skills in using technology, students' lack of technological tools and/or inoperative tools, families' understanding or lack thereof of the new educational model, and many other obstacles (Basich, 2020). The initial training of qualified educators needs to keep up with the development of new skills and competencies of students who need to be more autonomous in their learning process (Moran, 2020).

According to Moran (2020), school managers cannot lose focus on improving educational indicators, while also having to deal with the anguish and exhaustion of their teachers and ensuring support so that teaching can effectively and efficiently carry out the teaching-learning process. Managers were also encouraged to use creativity to use new technological resources (Ferri; Grifoni Guzzo, 2020). As a management challenge, there was also the difficulty in raising awareness among teachers regarding the production of adequate material for students, since not everyone would have technological resources. It was also noticeable the lack of ability to use platforms and other technological tools that were not previously part of their routine (Chen et al., 2022). For Basich (2020), the isolated use of digital tools is not enough for school success.

Research Methodology

This study aimed to understand, through a lens of school management, the impacts on the teaching-learning process in Brazilian Basic Education that used technologies during the Covid-19 pandemic. Specifically, we sought to problematize how the practices adopted by managers can contribute to the reduction or increase of these impacts.

To meet the proposed objective, Municipal Schools that offered Basic Education in the municipality of Cachoeiro de Itapemirim (ES) were selected as the field of study. The municipality of Cachoeiro de Itapemirim was chosen because it is a populous municipality, with schools located in regions with different economic and social characteristics. This allowed the replicability of this research so it could have a broader reach in other municipalities.

The municipality of Cachoeiro de Itapemirim has been investing in the training of its managers so that they can better organize their work plans and focus on priority issues for basic education. In recent years, it has seen growth in the IDEB, a low dropout rate, and a good approval rating. Quality basic education provides young people with better qualifications for the job market and social relations, and young people with technical skills and social responsibility become concerned about their municipality and preservation of the environment. This promotes a change in social and economic reality, helping to combat inequalities.

The type of research carried out was qualitative research of a descriptive nature, with the production of primary data through interviews with semi-structured scripts, carried out in person and online,

according to the availability of managers. Qualitative research, according to Creswell (2021), corresponds to a type of research that is structured by words, that is, an approach that seeks to understand the meaning that a group or individual attributes to a social or human phenomenon. Every procedure and data collection method involves contact with the group or individual in the environment in which the phenomenon occurs in a controlled environment (Godoy, 1995).

The selection of participants occurred through a series of prerequisites that are necessary to achieve the research objective. Thus, the data collection technique and the procedural method seek to understand other questions about the phenomenon and its relationship with the participants (Pereira et al., 2019). In the case of this study, the choice was to interview professionals who had experienced the educational environment over a time frame of four years (2019 to 2022). These time periods correspond to the period preceding the Covid-19 pandemic (2019); the period of school closures (2020 and the first half of 2021); and the period after the reopening of schools (from the second half of 2021). It is believed that these criteria allowed a more critical and in-depth analysis of the experiences lived and the strategies used by the manager in order to reduce the impacts generated by Covid-19 on school management.

Firstly, the year 2019 is considered to represent what has already been discussed regarding the use of technologies within the school context. Subsequently, it was discussed how these technologies were adapted to the onset of the Coronavirus pandemic, how this adaptation took place, and its impact on the teaching-learning process. The third moment, the post-pandemic period, is understood as a period of adaptation and was analyzed in the context of the future perspective regarding the incorporation of technologies in the teaching-learning process.

The choice of school managers in the municipal education network was determined as these are managers who work in both the administrative/financial and pedagogical areas, thus demonstrating a management that encompasses all aspects of the school.

Table 1 presents the profile of the participants:

Table 1 – Profile of research participants²

Interviewees	Age	Gender	Race	Education	Time of operation
E1	58 years old	Female	Brown	Degree in Pedagogy and Post-graduate Studies	20 years
E2	48 years old	Female	White	Teaching, undergraduate degree in Science, and post-graduate studies	12 years
E3	56 years old	Male	White	Bachelor's degree in physical education	5 years

E4	60 years	Female	White	Degree in Pedagogy and Post-graduate Studies	11 years
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Source: Research data.

For data production, the chosen technique was interviews with a semi-structured script and documentary analysis. According to Moré (2015), this interview provides a privileged relational space, that is, a primary place that the researcher seeks for the interviewee's action.

It is clear that schools have had a time lag in relation to technology for many years, as there was little investment in computers, and computer labs were closed due to deterioration and lack of maintenance and use of equipment. On average, schools had been without computer labs for about eight to ten years. There was a lack of initiative on the part of public managers in terms of investments and a lack of motivation on the part of teachers, since classroom technology was limited to the use of projectors to present documents, videos, and PowerPoint presentations. The documents show that, despite complaints about learning difficulties, the school sought resources and strategies for growth and adaptation to technology. It was also possible to understand the school's experiences during this period. Another contribution was the social media screenshots, which proved the existence of communication groups for parents and teaching staff, where content and activities were sent, in addition to where planning was done to make physical materials available for parents to pick up at the school and take home.

To this end, the document analysis protocol and interview guide considered three moments in this teaching-learning process: the moment preceding the Covid-19 pandemic, when technologies were already being used in the school context, albeit in an inefficient and unstructured way; the moment during the pandemic when the insertion of these technologies occurred instantly, without prior preparation; and, finally, the post-pandemic period, when an adjustment was made.

Based on the data collected and the transcribed interviews, content analysis was used, after the coding stages to create analysis categories and establish conceptual codes. According to Bardin (2011), content analysis is a methodological technique applicable to diverse discourses and different forms of communication, where the objective of linguistics is the word. Godoy (1995) states that the work carried out by the researcher must understand the meaning of the communication and, at the same time, seek another meaning or message.

Therefore, the data coding process was carried out in three parts: pre-analysis; exploration of the material; and treatment of the results: by inference and interpretation. In Pre-analysis, according to Bardin (2011), this involves the organization, transcription of interviews, elaboration of stages, and preparation of the material. The documents to be analyzed and the interviews for transcription were then separated. With the transcribed data and organized documents, a broader reading

was done to choose categories, organize indicators and themes, starting the categorization and coding process.

According to Bardin (2011), at this stage it is necessary to follow some rules: exhaustiveness, exhausting all information; representativeness of the universe through the sample; homogeneity, data with the same theme obtained from similar individuals; relevance of documents that converse with the research objective and exclusivity, each element must belong to a single category. At this point, a meticulous process was carried out to identify concepts and developments that would corroborate the understanding of the phenomenon and allow the analysis of its properties and aspects.

Correlating with the research, we sought the time periods that involved Covid-19, that is, the pre-pandemic period, during the pandemic period, and the post-pandemic period. Since, according to Leal (2022) and Basich (2020), all these contexts demonstrate the transition in the use of DCITs and the main changes from one period to another experienced by school managers and pedagogical staff.

In exploring the material, coding units were sought, which was carried out by the meaning of the words, cutting them out, enumerating, classifying, and aggregating them. Then, the categories were created following the following criteria: mutual exclusion, homogeneity, fidelity, and productivity, gathering the greatest possible amount of information. For Bardin (2011), in the third phase of processing the results (inference and interpretation), there should be an attempt to refine the results, making them meaningful and valid, in the search for potential content, which is found in the gaps of what was presented and understood.

Based on the answers in the interview script, based on temporal aspects and the teaching-learning process, the process of categorizing and coding the data began. That is, with data on the professional experience of school managers, the impacts of Covid-19 on the in-person teaching modality, the frequency and use of ICTs before, during, and after the pandemic, the difficulties of both students and the pedagogical team and the strategies that were used both during the pandemic and post-pandemic. Given the pandemic scenario, there were many changes in school management and school structure, the experiences reported emphasize the increase in the prolonged and exclusive use of ICTs to access students, families, communities and staff, in the face of social distancing.

Table 2 presents the categories, subcategories and main codes:

Table 2 – Dimensions of analysis, codes and categories

CENTRAL CATEGORY	CATEGORIES	SUBCATEGORIES	MAIN CODES
COVID-19	Pre-pandemic	Convenience	Early career
			Internet
			Available equipment
			Entry into school management
	Pandemic	Contact	Communication between teachers
		Change	Isolation
			Equipment purchased
		Adequacy	Priority for protection
			Using technology to develop and teach classes
	Post-pandemic	Re-adaptation	Use of pedagogical resources
			Alternatives for communicating with staff and parents
			Advances noted post-pandemic
			Setbacks noted post-pandemic
		Tool	Resources currently used

Source: Research data.

Results

The results related to the pre, during, and post Covid-19 pandemic contexts are presented below.

Pre-pandemic context: convenience and contact

The first two categories refer to the period prior to the final months of 2019, in which the Covid-19 pandemic had not yet occurred, and were identified as Convenience and Contact. The Convenience category refers to the period in which individuals had a routine, daily commitments, and occupations that allowed them to live without abrupt changes. In other words, an adequate development of the phases of life,

in which individuals grew, aged, and sought to achieve personal and professional goals and objectives. According to E3's report:

I have a degree in physical education from the Federal University of Espírito Santo. I have worked in the city government of Cachoeiro, at this school, for 32 years. I also worked at a state school, where I was a coordinator for 22 years, and I have been a manager since 2018. The academic part never prepared me for coordination and management. [...] I learned at school [...] how to coordinate, and then how to be a good manager. In my case, I went because the manager passed away, I never intended to be a manager. Then, after I started, I'm here, and I really like what I do. I do it with all my heart (E3).

In the interviewees' statements, it is possible to note a predominantly negative feeling regarding the use of technological equipment in schools. It is noted in the interviews that the use of these technologies in general presented several limitations, such as an insufficient amount of equipment available for the entire school, defective equipment, and the issue of hiring people to maintain the computer lab. E4 exemplifies:

We already had computer labs at the school a few years ago, but then it was deactivated, because it ended up hiring people who were part of the federal government program, and then the program ended. We still used it for a while, but then it ended (E4).

The equipment most used in the pre-pandemic period consisted of computers and video projectors. Regarding the use of the internet, it was observed that, like the technological equipment available in the pre-pandemic period, this was also precarious and limited. It is noted that, in some statements, there was internet in all these schools, however, its use was only for the secretary or had limitations with blocks on websites that made it difficult to use for research.

Regarding the interviewees' careers, it was observed that most of the managers had remained in the same school for many years, with similar trajectories, having previously worked as teachers before taking on the role of school manager. Therefore, upon reaching the position of school manager, they already knew the teaching staff, the students, the internal and external functioning of the school, the community, and the students' parents. As indicated in E2's report:

I was in my second year of college, and then I was invited to work at a public school, already working with the sixth or ninth grade at the time. So, from there I continued. It was at the philanthropic school, then I came to the municipal network, to the state network too, soon after, and then I started working in these two networks. [...] So I stayed at a school, then I asked to leave due to some situations in that school, I was invited to work in the school management of another school there and I also stayed for almost five years. And then that's when the manager here retired and then they invited me to also take over this school. It was in November 2018. And here I am (E2).

The Contact category consists of individuals' daily experiences with each other and face-to-face encounters, with touch, presence, proximity, and group experiences. That is, in daily activities in which individuals met people, shared personal objects, and were in the same environment as other people. Therefore, these are categories based on social perceptions of when the limiting aspects brought about by the pandemic did not exist. However, it was possible to observe that, even in the pre-pandemic period, communication between teachers was mediated by technology, such as the use of WhatsApp groups, e-mail,

and phone calls, was not exclusively face-to-face, and groups were used to publicize actions within the school.

Challenge and adaptation: the educational experience during the pandemic

The Challenge category refers to the scenario of uncertainty and fear. In addition to the fact that concern for health had become essential to prevent the transmission of and contamination by the virus, the use of masks and alcohol gel were essential when it was necessary to leave the house. It is worth noting that social isolation, the sudden change in routine, and the prevention of daily activities such as socializing, going to places to study, to work, and for entertainment were adversities that happened suddenly in the face of the urgent collapse in health. As pointed out by E4:

When it first appeared (Covid-19), there was a period of doubt, right, about what it would be like. But, as it became isolated, the school really couldn't continue, right, and everyone was like that. Initially, it was practically total isolation, right, and then they suspended it, there were some returns, they suspended classes (E4).

The Adaptation category refers to the strategies and methods that people had to create, apply, and try to follow to deal with adversities during the Covid-19 pandemic. In other words, individuals had to adapt their lifestyle and routine, which were restricted by the transmission of Covid-19 and government enforced social distancing policies. One of the most used strategies, as previously mentioned, was the use of active searches, which were done through searching for and contacting students and parents of students who were absent and/or had not submitted their activities. Students who did not have internet or technological equipment could retrieve the materials through distribution and collection activities, materials were produced by teachers and printed at the school. The teacher forwarded the activities via WhatsApp groups. Students who were unable to access them looked for printed materials at the school, so that they would not be left out of the process.

The post-Covid 19 context: tool and readaptation

Starting in the second half of 2021, schools reopened and in-person classes resumed. The Tool category consists of using ICTs as essential allies to promote the learning process and to ensure access to information, meetings, and curriculum content. According to E2:

It depends a lot on each dynamic, on each teacher, because the class itself is very dynamic, each teacher has their own way of working. There is a teacher who, for example, works with podcasts, but that is her own structure. I have a teacher who, with very young children, already works with some interactive games, but we also know that not all teachers have this connection yet, some still have difficulty. So, it depends a lot on this dynamic. Of course, we try to make these plans really be implemented, all this technology that we have today, in favor of them. But we also know that we still have some, many, situations to overcome (E2).

The Readaptation category refers to the return to normality after a year and a half of the pandemic scenario, in which restrictions were

lifted and individuals could resume daily activities and tasks from before the pandemic. However, the post-pandemic period also brings with it the reflection of how turbulent the drastic changes were, and the return to normality is difficult due to exposure to factors that caused intense suffering, requiring adjustment in light of the new perspectives acquired. According to interviewee E2, there was a noticeable difference between the learning of students whose families had resources and greater knowledge, and students from families without resources:

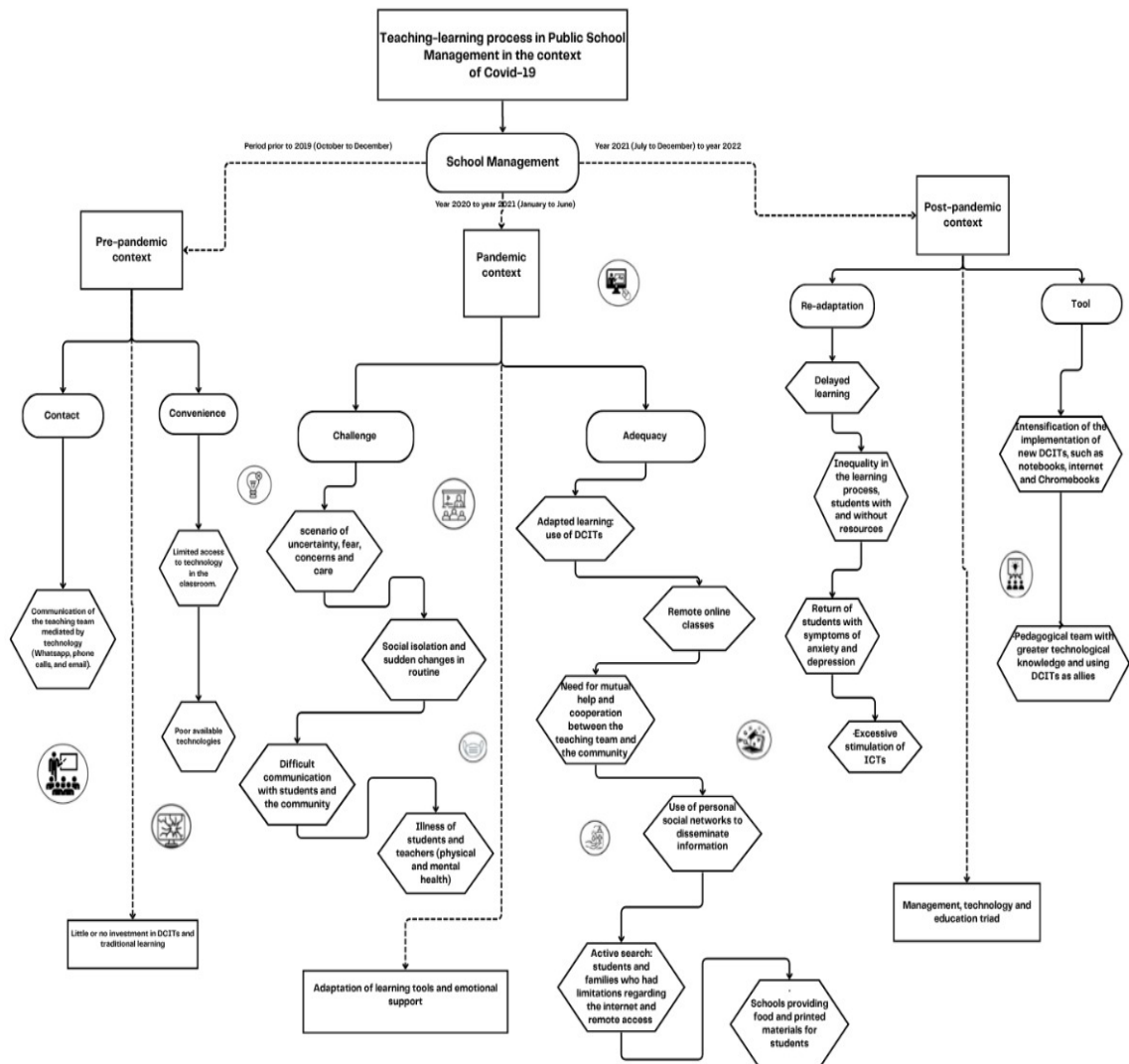
The differences were very striking. We saw the levels of knowledge of everything. Social levels, how this difference became discrepant. Why? For example, I received a student in the fifth grade for a diagnostic assessment, [...] who seemed as if the pandemic had not happened. Incredible! In just a few months. But why? It was that family that had the support, it was that family that had the most social knowledge. And, at the same time, we also had those other children who [...] they returned with greater difficulties, because they had remained stagnant. Do you understand? So, the differences in the levels of these children were striking. [...] So, with a lot of processing, it was heartbreaking to see this difference, which was very difficult for us to work with. [...] So, we saw children there who already had all the knowledge, they could continue, it was incredible to see that, and others who were not even literate (E2).

Regarding the setbacks and harm that the pandemic has brought to education, the managers' statements highlighted how much teaching fell behind during this turbulent period, with some students able to keep up with the subjects taught virtually and others left behind with the same level of knowledge as before the pandemic. Furthermore, a major difference was also noted in students' behavior, with many returning to school with anxiety attacks and depression. E4's report exemplifies this situation.

The student's adaptation was very difficult. We had many cases of anxiety attacks, we were like that for a period, then we returned halfway through the year, in the third quarter. So, this third quarter was the most difficult, because it was the time when the child returned to school, so many parents had difficulty, were afraid to return with their child. Sometimes it took a while to return. Those who returned, they were afraid, anxious, and had to do this whole process of attending to them, talking, calming them down, settling them down. So, it was a very complex beginning, last year it was the whole year (E4).

Figure 1 summarizes the main findings of this research.

Figure 1 – Teaching-Learning Process in Public School Management in the context of Covid-19



Source: Prepared by the authors.

Discussion of Results

Based on the results released, pertinent issues raised by managers in the pre-pandemic, pandemic, and post-pandemic periods can be observed. It is clear that the Covid-19 pandemic brought changes not only in the health field, but in several areas of individuals' lives. In the pre-pandemic period, there was an emphasis on DCITs that schools already had, such as Connected Education, a program created in 2017 by

the Ministry of Education to promote technology in schools, enabling access for both students and teachers.

According to Froehlich (2021), the Educação Contactada (Connected Education) program became a key point to support schools during the Covid-19 period, containing digital platforms, Digital Educational Resources (REDMEC) and Collaborative Virtual Learning Environments (AVAMEC), respectively, to disseminate information, content, and materials recommended by teachers and for courses aimed at the community. Carvalho, David and Vasconcelos (2021) point out that the program was in the expansion phase when the pandemic emerged, and the barriers to digital inclusion in education became distinct, that is, the digital inclusive public policies in this study proved to be inefficient for universal access in the pandemic context. However, the pedagogical team and the community used the program as alternatives during this period.

In addition to this program, one interviewee mentioned Educar para Valer (EPV) or Education that Counts, created in 2018 by Associação Bem Comum (ABC) or the Common Good Association in English, which provided support during the pandemic, as it is a program that undertakes changes in school management and ensures student initiation, regular attendance, and continuity in schools (Norberto, 2022). According to Franco Franco and Longhi (2022), Pires (2021), Klussman et al. (2022), and Antonio et al. (2021), education is essentially community-based, and therefore the impact on communication and the teaching process was drastic, requiring remote teaching and the use of social media to teach, distribute materials and activities, information, messages, and to receive feedback from communities. All interviewees pointed to the use of private social media, since schools did not have one and the government did not implement the use of social media as an alternative. Therefore, many families were confused and did not receive crucial information, as they were unable to go to the school office.

The interviewees also point out the mental health of students, stating that students returned to in-person classes in the second half of 2021 with fear and robotic behavior. Maia and Dias (2020) raise concerns about the impacts of the pandemic period on students' mental health, with a significant increase in psychopathological symptoms such as anxiety, depression, and stress. Sunde (2022) reflects on the excessive concern about the uncertain future and the death of loved ones, which caused episodes of stress, fear, and panic in students. Both students and teaching staff were exposed to fear of contamination and psychological disorders such as anxiety, mood swings, depression, and post-traumatic stress.

Regarding ICTs, the pandemic brought benefits and harms that occurred in schools, exemplified by all interviewees. The benefits were highlighted as: more dynamic classes with the use of applications, videos and platforms, teachers equipped with electronic devices and internet availability throughout the school. Farias and Nascimento (2022) state that technology transforms environments and can help students

build knowledge and synthesize content acquired in class. Therefore, ICTs showed an important role in didactics, teaching and communication (Sousa; Borges; Colpa, 2020).

However, the disadvantages pointed out were: dependence on technology, decrease and/or delay in learning due to lack of access and preparation for the use of technological resources. Silva, Moura and Santana (2022) and Júnior et al. (2020) point to the impacts of dependence on ICTs, since this has, as consequences, the difficulty of learning and concentrating on activities, low attentional focus and misinformation due to fake news that is spread on social media. In this last consequence, it is observed the difficulty of filtering information and seeking veracity, since students are bombarded by several pieces of information at the same time.

Bispar, Magalhães and Moreira (2020) indicate that the pandemic and DCITs brought about the virtualization of students' social relationships, in which there is difficulty in interacting without the presence of electronic devices, causing impacts on the development of essential skills such as language, emotions, psychological organization, imagination, and creativity of children and adolescents.

It was possible to observe that, before the advent of the Covid-19 pandemic, the public schools of Cachoeiro de Itapemirim, in their entirety, suffered from the precariousness of the lack of technological equipment or its inadequate functioning. The use of the internet was restricted to the secretariat, for carrying out administrative tasks, and when it could be used by teachers or students, it was of limited reach and slow. During the pandemic, several adaptations had to be made by the administrators and other school staff, so that students could attend classes online and receive the weekly activities. In addition, the secretariats promoted the distribution of food to the community and to students who needed it, due to the lack of school meals.

School administrators had to deal with the difficulty teachers had in learning how to use ICTs, in addition to the challenge of finding and contacting students during the pandemic. After the pandemic, there was a notable improvement in obtaining technological equipment in schools, and a significant improvement in the quality of the internet available in them. However, there was also a significant impairment in students' learning, in addition to unfavorable consequences for their mental health.

For Nobre et al. (2024), the lessons learned from the COVID-19 pandemic suggest that school management practices need to include all stakeholders involved in education, from teachers and students to family members and other members of the school community. Additionally, Ragazzo and Almeida (2022) suggest that school managers can benefit from mentoring and training programs in which peers can help with the specific challenges that each school faces.

One of the objectives of planning educational policies is to define priorities by directing efforts and resources towards their implementation (Najjar; Mocarzel; Morgan, 2020). For Souza and Mocarzel (2023),

such policies need to be developed through an adaptation between the old normal and the period of Emergency Remote Education (ERE), making it necessary to seek new educational strategies, in which digital and in-person dialogue and can help reduce inequalities. Additionally, the results demonstrate that this process of constructing new educational policies must also involve the psychosocial support of students, teachers, and family members. Regarding the main objective proposed by this study, it was conceivable to visualize the nature of these impacts through the eyes of the interviewed managers of the selected schools. The managers were able to provide a detailed view of the current post-pandemic scenario in public schools, in addition to facilitating the understanding of the pre-pandemic, pandemic, and post-pandemic scenarios. The study advances the literature on key points of developments and setbacks in teaching and learning during the pandemic and post-pandemic periods, using the pre-pandemic period as a basis for comparison. Thus, this study investigated the strategies used by managers according to the demands arising from remote teaching, ICTs as essential support and social distancing.

Final Considerations

The objective of this study was to understand, through the lens of school management, the impacts on the teaching-learning process for Basic Education with the use of technologies in the context of Covid-19. Based on the data presented, it is clear that the impacts of the pandemic were drastic, and the lack of contact and social isolation affected the structures not only of schools, but also health, businesses, and many institutions. Therefore, education was one of the areas impacted during the pandemic, due to the impossibility of face-to-face classes. Thus, based on guidance from the government and education departments, school managers sought strategies to deal with this new context.

Implications for practice

The results of this study suggest practical implications for people managers, especially in the school context. Firstly, the importance of developing specific training, carried out periodically, for the use of Digital Information and Communication Technologies (DCIT) is highlighted. In addition, the implementation of bonuses for teachers, coordinators and school principals who demonstrate improved skills in the use of these tools for the teaching and learning process in Basic Education is recommended.

The acquisition of computer equipment and software licenses is also essential to promote students' guided autonomy in teaching practices. Furthermore, it is suggested that mental health training be developed for students and their families, teachers and coordinators, in order to promote a healthier teaching environment. Finally, it is recommended that a post-pandemic learning report be prepared, with the aim of assessing which emergency tools adopted during the pandemic can be permanently integrated into the post-pandemic educational context.

Limitations of the study and suggestions for future research

Despite the advances, this research has limitations. The first limitation is that most of the participants were female, which may imply a unique profile of responses, based on their experiences. Therefore, future research with school administrators can broaden the view of the phenomenon from another gender perspective. A second limitation is related to the number of interviewees, four in total. This limitation was due to the fact that one of the requirements for participation was that the administrator had worked at the school in the pre-, during-, and post-pandemic periods. Future research can expand the number of participants, also conducting interviews with other school employees about the perceived impacts, as well as other participants who represent the school community (parents and representatives of education departments, to name a few). Future research with the participation of pedagogues, teachers, family members, and employees of education departments can provide an analysis of the difficulties encountered in the strategies used in the different contexts of action.

A third limitation of the study is the fact that the research was conducted in only one municipality, located in the interior of Espírito Santo. Despite the results obtained, future research suggests expanding the scope to include public schools in other municipalities, as well as state, private, and federal schools. Future research is also needed to broaden the understanding of the impacts of COVID-19 on public education, studies involving the management of human relations within school organizations in the post-pandemic period, affirmative actions used to reduce the impacts generated on student learning, as well as studies on the management of investments in technologies and the continued use of ICTs. In this way, the impacts brought about by the COVID-19 pandemic on student learning can be better understood and addressed.

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Notes

¹ Ministry of Education (MEC) Ordinance No. 343 of March 17, 2020.

² Note: the definition of race was carried out through the self-identification of the interviewees.

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Renata Guimarães Siqueira Fernandes holds a master's degree in Administration from Fucape Business School. She has a postgraduate degree in Teaching Mathematics and Physics from the Faculty of Technology and Sciences of Alto Paranaíba (FATAP), and a Bachelor's degree in Mathematics from the São Camilo University Center. She is currently the Pedagogical Coordinator at the Education Department of Espírito Santo (SEDU-ES).

ORCID: <https://orcid.org/0009-0001-4360-5988>

E-mail: renatagsf@yahoo.com.br

Amanda Soares Zambelli Ferretti holds a PhD in Administration from the Federal University of Espírito Santo (UFES). She holds an MBA in Business Management from the Getúlio Vargas Foundation (FGV) and a Master's degree in Administration from Fucape. She is currently a full professor in the Department of Administration and in the Postgraduate Program in Public Policy (PPGPol) at the Faculty of Higher Education of Linhares (Faceli).

ORCID: <https://orcid.org/0000-0002-5761-2206>

E-mail: amandazambelli@gmail.com

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