IMPACTS OF DIGITAL GOVERNANCE ON BRAZILIAN EDUCATION: A LITERATURE REVIEW IN SCIELO

Silvinia Pereira Souza Pires[1], George França dos Santos[2], Rosy Franca Silva Oliveira[3] and Paulo Fernando de Melo Martins[4].

ABSTRACT
Digital governance in education is a recent subject in scientific research and political discussions in Brazil. In expansion, this theme is related to the use of technological systems in educational systems, in school management and pedagogical practices in the classroom, with effective participation of school actors. The article aims to identify in the literature which education departments in the Brazilian federation have applied digital governance systems and practices, seeking to unveil the effectiveness and challenges for this materialization in education in these spaces. With a qualitative approach, the methodology is anchored in bibliographic research using content analysis. The data, consisting of scientific articles, were selected from the Scielo database. The research allowed the identification of 15 articles selected after applying inclusion and exclusion criteria between the years 2010 and 2023. For the search, we used terms that are mobilized to express the integration of digital governance in education and point to effective digital transformation and to challenges of materializing digital governance in education. The results indicate that the practices and systems materialized in the researched scenarios, although they have faced challenges for their effective implementation, are essential to ensure a more effective, democratic administration for the transformation of society, contributing to the promotion of a more inclusive and quality education.

Keywords: Digital Governance. Digital Transformation. Digital Government. Education.

[1] Graduated in History
Federal University of Tocantins (UFT)
R. Florêncio Machado, s/n, Setor Alaska, Araguaina – TO, CEP: 77800-00
Email: silvinia.pires@gmail.com
LATTES: http://lattes.cnpq.br/1698609148721868
[2] Graduated in Philosophy, Federal University of Santa Catarina (UFSC), Master's Degree in Production and System Engineering: Media and Knowledge (UFSC), Doctorate: Education and Curriculum (PUC SP), E-mail: george.f@uft.edu.br
LATTES: http://lattes.cnpq.br/6683312593254876
[3] Master's student in Education
Federal University of Tocantins (UFT)
R. Salomão Cardoso, 671, Setor São Miguel, Araguaina – TO, CEP: 77817-190,
Email: rosyfranca@uol.com.br
LATTES: http://lattes.cnpq.br/7478648744630334
[4] Doctor of Education
Federal University of Tocantins (UFT)
Quadra 1204 Sul, Alameda 3, Lote 1, Palmas – TO, CEP: 77019-524
Email: paulofernando.uft@gmail.com
LATTES: http://lattes.cnpq.br/2661972458974754

INTRODUCTION

According to Gomes, Moreira and Silva Filho (2020, p. 432), the state of the art in the field of public administration, since the eighties, "has resorted to the adoption of good governance practices", as a strategy to promote the improvement of public services, the goals stipulated by the managerial reforms associated with the *new public management* and, in Brazil, to the new public administration. From then on,

> [...] the national literature has focused on the study of multiple manifestations of governance, such as its expression in the form of *accountability* and transparency [...], the implications of its network effects [...] and its relationship with information and communication technologies (ICTs), in the form of IT governance (Heindrickson & Santos Júnior, 2014; Pereira, Macadar, & Daniel, 2013; Santos & Santos Júnior, 2017), with emphasis on the interface between e-government and governance (Braga & Gomes, 2018) (Gomes; Moreira; Silva Filho, 2020, p. 432).

Zacarias' (2020) studies, which are based on his experiences and observations on public administration, address how digital technologies can improve the relationship between government and citizens. For this researcher, digital governance refers to the use of communication and information technologies to meet the demands of society, in a fast, innovative and participatory way. In this sense, the discussions of this researcher contribute to the debate and proposal of public policies for the evolution of digital governance in Brazil, a crucial field for the modernization and efficiency of the public service. The digital revolution has significantly transformed society, impacting all sectors, including education.

Digital governance has been a fertile field for innovation in the public sector. In this context, digital governance in education emerges as a crucial element for improving government systems, providing not only operational efficiency, but also ensuring the full exercise of citizenship in the digital world. The rise of the digital age has caused profound transformations in various sectors of society, and education is no exception. The integration of digital technologies in the educational environment not only shapes the way educational institutions are learned, taught, and managed, but also imposes unique challenges that demand a strategic and effective approach. In this scenario, digital governance emerges as a fundamental piece to ensure the transition from traditional education to a digital environment, preserving essential values and promoting active and informed citizenship (Mello, 2009; Better; Slomski, 2010).

In view of this theme, the following research questions guided this study: In which education secretariats in the Brazilian federation were digital governance applied? What

is the effectiveness of the applications of digital governance in Brazilian education? What are the challenges indicated in the researched studies for an effective application of digital transformation in Brazilian education?

In Brazil, where cultural richness is intertwined with geographical diversity, the effective implementation of digital governance in education systems becomes an imperative. This research project aims to explore the current situation of digital governance in the Brazilian educational context focusing on the specific challenges that arise from the interaction between digital transformation, the connectivity of technological devices, the promotion of digital citizenship and the optimization of educational services.

When considering the uniqueness of Brazil's educational environment , marked by distinct socioeconomic and geographic characteristics, it is essential to develop tailored strategies to address the unique challenges of this region. The pursuit of excellence in digital governance is not only a response to technological advancement, but a pressing need to ensure that education continues to be a transformative vehicle, promoting sustainable development and the full participation of citizens in the digital society.

Adopting a qualitative approach, the bibliographic research developed a systematic literature review based on data searches in the Scielo database, in July 2024. The research allowed the identification of 15 articles selected after applying inclusion and exclusion criteria between the years 2010 and 2023, representing an interval of 14 years. This information is expanded in the methodological section of this chapter.

Therefore, the objective of this investigation is to identify in the literature in which education secretariats in the Brazilian federation digital governance systems and practices were applied, seeking to unveil the effectiveness and challenges for this materialization in education. To achieve this objective, this text initially takes a theoretical approach to what digital governance is, its subdivisions, its impacts and challenges for effective digital education. Next, the methodology is presented, followed by discussions of the results and considerations.

DIGITAL GOVERNANCE IN EDUCATION: CONCEPTS, IMPACTS AND CHALLENGES

Information and Communication Technologies (ICTs) have changed the form of communication in public management, with the adoption of electronic government to provide services quickly and efficiently, meeting the demands of society (Gomes; Moreira; Silva Filho, 2020). In this sense, based on the studies of Mello (2009) and Mello and

Slomski (2010), the construct of digital governance arises in the context of the facilities of ICTs applied to government functions, building a new relationship between government and society, whose relationship, new by the way, is called digital governance. "This is a new management model towards which the Brazilian public administration is oriented, which is closer to the managerial model with characteristics of the societal model of public administration" (Gomes; Moreira; Silva Filho, 2020. p. 434)

According to Mello and Slomski (2010, p. 379), digital governance "is the use by the public sector of innovative information and communication technologies, such as the internet, to offer citizens quality services, reliable information and more knowledge, in order to facilitate access to government processes and encourage citizen participation".

Gomes (2019) addresses digital governance as an evolutionary stage in the provision of public services through digital means, also known as 'electronic government'. According to this author, digital governance is understood as a process that aims at the execution of government functions and the participation of society, seeking the common good and the strengthening of digital democracy. It is characterized by the use of information and communication technologies (ICTs) to promote interaction between the government and civil society, allowing the formulation, monitoring and evaluation of public policies.

The study highlights that social participation is a defining element of digital governance and that, despite the importance of measuring this governance, there is a gap in the ability of organizations to measure their level of compliance with good digital governance practices. The construct of digital governance is represented by five factors: content, service, citizen participation, privacy and security, and usability and accessibility. Gomes (2019) also mentions that the adoption of social participation mechanisms on websites is one of the biggest challenges to achieving effective digital governance in Brazil.

According to Afonso (2021), digital governance refers to the way digital platforms and digital technologies influence the administration and management of institutions. This governance is characterized by the need for transparency and citizen participation, since processes are often presented as opaque. Digital governance implies a challenge to ensure that decisions and practices related to the use of data and technologies are ethical and responsible, preventing the power of platforms from overriding the voice and rights of citizens.

According to research by Mello and Slomski (2010), digital governance is a construct structured in two dimensions: digital government and digital democracy. Next, based on these authors, Figure 1 represents the structure of digital governance practices, considering that the practices of 'content and 'services' represent digital government, the practices of 'citizen participation' represent digital democracy, and the practices of 'privacy and security' and 'usability and accessibility' are related to both digital government and digital democracy, since, according to the authors, they are practices that are related to the system as a whole, being necessary for the effective functioning of other practices.

Figure 1 – Structure of e-governance practices
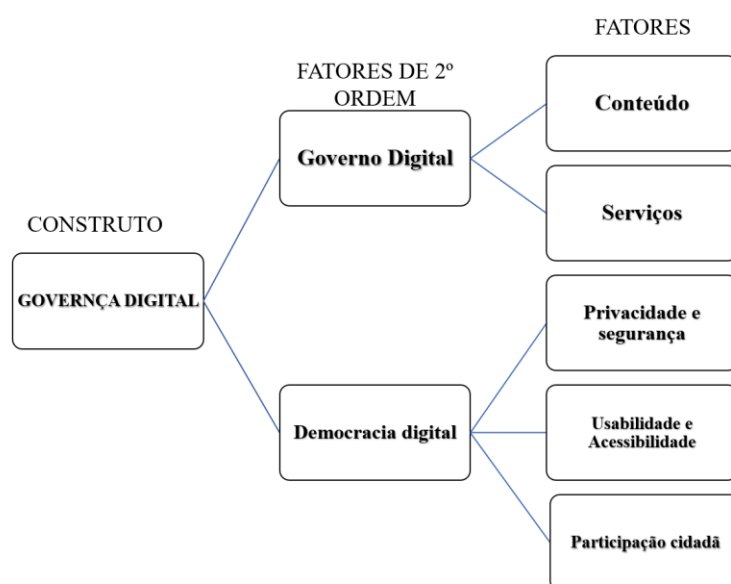
Source: Mello and S Slomski (2010, p. 385) adapted.

In the context of digital government, the transformation of public services through digital technologies, offering content and services, promoting transparency and accountability to citizens, stands out. For Mello and Slomski (2010), digital government aims at citizen participation in government decisions, making the provision of services more democratic. The authors add that digital government uses information and communication technologies to transform the provision of public services, promoting transparency, citizen participation and administrative efficiency.

Digital democracy refers to the use of digital technologies to strengthen citizen participation in political decision-making and monitoring of government actions, as well as in the optimization of services provided by the government (Mello; Slomski, 2010).

Digital governance in education involves the use of digital technologies to improve school management, access to quality education, and communication between school, students, and families. Technologies can expand educational opportunities with more effective participation of the school community aiming at the effectiveness of quality education.

> E-governance requires several elements of good governance, such as transparency, accountability, participation, social integration, public financial management reform and development, including a wide range of services for almost all segments of society, but most of the common areas of e-governance application are: education, transport, agriculture, taxation and revenue, law enforcement, e-commerce and business regulations (Mello, 2009, p. 40).

Education, as Mello (2009) points out, is a common area of application of electronic/digital governance. In this line, the studies of Buzato (2010) address the importance of new digital literacies in education and social transformation, highlighting the relationship between technological appropriation and digital literacy, emphasizing that literacies are always situated in specific contexts and that there is a relationship of co-production and recursion between literacy and context. In addition, Buzato (2010) proposes a critical analysis of proposals for pedagogical innovation around new technologies, especially Web 2.0, seeking to reterritorialize and reinvent the discussion around technology, freedom and social transformation in education. This is equivalent to proposing, according to the author, that the school uses new technologies to develop architectures of participation while resisting and teaching to resist the architectures of exploration.

> [...] Worse than that, by not consciously and critically using the frontier objects that are offered to them (or imposed, as the case may be) by the new technologies, educators and students will simply be engaging in the work of Sisyphus to which I have already referred. In other words, frontier objects not used to strengthen architectures of participation within the school will certainly be used by architectures of exploration that we come across outside of it (Buzato, 2010, p.300).

In the referenced quote, Buzato (2010) emphasizes the importance of an education that not only reproduces content in a monologized way, but that allows students and teachers to appropriate new technologies in a creative way. For the scholar, this involves negotiating and adapting curricula and pedagogical practices to local realities, promoting a critical awareness of the mechanisms of hegemony that may be present in technologies.

By highlighting the importance of organizing curricula and pedagogical practices according to local realities, digital governance in education enables the creation of educational environments that promote critical awareness about the mechanisms of hegemony present in technologies, with implications not only for the integration of digital technologies in an innovative and significant way in the teaching-learning process, but also in the constant reflection on its use and impact on the development of students (Buzato, 2010).

It is crucial that educators and learners are able to consciously and critically use the technological tools available, in order to strengthen architectures of participation within the school and prevent these same technologies from being used for exploration purposes outside the school environment. Digital governance in education, therefore, must ensure that technologies are used ethically, inclusively, and democratically, promoting the empowerment of those involved and fostering an education that stimulates the creativity, autonomy, and critical capacity of individuals (Buzato, 2010).

Thus, the impacts of digital governance on education are intrinsically linked to the transformative potential that digital technologies can provide, provided that they are properly used to promote innovative, participatory and critical education. Digital governance in education thus emerges as a means of ensuring that new technologies are allies in the educational process, favoring the integral development of students and the construction of a more just and democratic society.

Lima (2021) shows that electronic platforms in educational administration have stood out as a growing digital path, but criticizes these transformations, since they may be contributing to a transformation in rational-legal authority to rational-informational domination. For the author, online education platforms, such as Blackboard, Moodle and Canvas, are changing the concept of education, educational experiences and forms of rationality, combining traditional hierarchies with navigation and hypertextuality. The author highlights that electronic platforms can function as instruments of control and as obstacles to the exercise of the autonomy of schools.

According to Lima (2021), these platforms generate greater efficiency and comfort in daily life, modernizing and reducing bureaucracy in the sectors in the area of communication, financial management, careers, promotions, among others, in a generalized way. On the other hand, the author points out possible harms, such as dehumanization, digital domination, increased bureaucracy, erosion of democracy,

recentralization of decisions, digital control and surveillance, dehumanized education and schooling processes.

In this sense, Lima's (2021) critique revolves around managerialist promises that debureaucratization would lead to a more efficient and less bureaucratic educational administration. Instead, the author argues that these promises do not materialize, and bureaucracy can be intensified in new forms, such as "hyperbureaucracy," in which the new machines for administering education tend to produce an education that is more rational in formal terms but more irrational in substantive terms. This means that while processes may appear organized and efficient, they can fail to meet the real needs of students and education.

The implementation of information technologies and digital control can result in dehumanized educational processes. The emphasis on metrics and evaluations can lead to an educational experience that ignores the human dimension and autonomy of educators and students. Instead of a true debureaucratization, the author argues that new administrative practices can lead to a "rebureaucratization", where traditional bureaucratic mechanisms are maintained or even reinforced under the appearance of innovation and efficiency (Lima, 2021). These criticisms reveal a concern about how education administration is being transformed in the digital age, suggesting that the proposed solutions may not be as beneficial as hoped.

In this line, some of the challenges to implementing digital governance in educational institutions include the need for adequate technological infrastructure, training of professionals, ensuring data security, and digital inclusion of all those involved. This situation became quite explicit in the pandemic period (Covid-19), in which the acceleration of digital technologies was forced within the conjunctural process placed in the period of great uncertainties and digital needs. The main challenges faced by teachers during the pandemic included the difficulty of adapting to remote teaching, which required new knowledge and technological skills to use digital platforms and online resources effectively (Oliveira; Pereira Junior, 2020). These challenges reflect the complexity of the situation faced by education professionals and the need for effective strategies to include education in the digital world.

METHODOLOGICAL APPARATUS: DATA COLLECTION, SYSTEMATIZATION AND ANALYSIS

Qualitative in nature, this research is of the bibliographic type, which, according to Gil (2017, p. 33) "is elaborated based on material already published. Traditionally, this type of research includes printed material, such as books, magazines, newspapers, theses, dissertations and annals of scientific events". For this work, books, theses, dissertations, and articles were used as a bibliographic reference on digital governance in education. The research followed the following steps: definition of the theme; preliminary bibliographic survey; formulation of research questions; search for sources in databases and printed and digital supports; reading of the material; registration of the main points; logical organization of the subject; writing of the theoretical text; selection of data and construction of the analysis plan; final writing of the research text.

To approach the qualitative data of this research, content analysis was adopted, understood as "a research technique to make valid and replicable inferences from the data to their context (Kripperndorff 1980, p. 21 apud Ludkë; André, 1986, p. 41). Once the technique was defined, the next step was to delimit the unit of analysis, which could be a word, the sentence, the paragraph or the text of the selected articles as a whole, based on analyses of expressions, themes, systems, and practices on digital governance in education.

The selection of data took place in the Scielo database, using terms mobilized to express the integration of digital governance into education and point to effective digital transformation and challenges of materializing digital governance in education. The terms used to search for the articles were: digital governance in education; digital transformation in schools; digital democracy in education; digital government and education. 15 articles were selected, covering the period from 2010 to 2023.

For the selection of articles, the titles, manuscript abstracts, and data analysis sections were read, applying the following inclusion criteria: direct mention of the terms mentioned above in the title and/or abstract; practices implemented in the municipal and/or state education network; reference to digital culture in schools. As an exclusion criterion, it was defined not to select articles that dealt with foreign scenarios and other spheres of the Brazilian government, such as security, health, etc.

After the careful selection of data for analysis in the Scielo database, the articles were systematized in chronological order, indicating the last name of the authors used in

the scientific calls, title and year of publication to identify the manuscripts, resumed in the specific section of data analysis, as shown in Chart 1, below:

Chart 1 - Articles selected from the Scielo database on digital governance in education

Author(s)	Title	Year Publication
Aureliano; Queiroz	Digital technologies as pedagogical resources in remote teaching: implications for continuing education and teaching practices	2023
Silva et al.	Educational governance in a pandemic scenario: mapping public actions in the state of Amazonas	2023
Nunes; Malagri	The State of the Art on digital transformation and blended education	2023
Martins et al.	Innovation management system and digital transformation: in search of an integrated approach	2023
Santos et al.	Use of digital educational resources by educators in the early grades of elementary school	2022
Braga; Zacarias; Champoski	Mobile applications and digital governance in Brazil: A case study of the "piá project", from the State of Paraná	2022
Gates; Faria Filho	Technologies and school education: can the school be contemporary with its time?	2021
File	Machines for managing education: digital domination and increased bureaucracy	2021
Olive tree; Pereira Junior	Teaching work in times of pandemic: another portrait of Brazilian educational inequality	2020
Afonso	New paths for sociology: Technologies in Education and Digital Accountability	2020
Sherer; Bred	Integrating digital technologies into the curriculum: dialogues on challenges and difficulties	2020
Modelski; Giraffe; Casartelli	Digital technologies, teacher training and pedagogical practices	2019
Gomes; Moreira; Silva Filho	Citizen participation: the digital governance gap in education agencies and foundations in Brazil	2019
Buzato	Digital culture and upward appropriation: Notes for an education 2.0	2010
Ferreira; Castiglione	ICT in education: personal learning environments in the perspectives and practices of young people	2018

Source: Prepared by the authors with data from the research.

Considering that studies on the theme of digital governance in education in Brazil are recent, only these articles were selected given the scarcity of research that actually measures digital governance in educational organizations.

DIGITAL GOVERNANCE IN THE BRAZILIAN SCENARIO: DIGITAL TRANSFORMATION PRACTICES IN EDUCATION

In this subsection, the data collected on digital governance, digital transformation in education and emerging business models in the Brazilian educational context are analyzed, identifying systems and practices materialized, carried out, in addition to

pointing out the challenges posed by the studies. For didactic purposes of the analysis of the systems and/or governance practices materialized in education in the cataloged articles, the data were classified at the municipal, state and national levels, according to Tables 2, 3 and 4.

Chart 2 - systems and practices of governance in education implemented in municipalities

Article	Locality	System, practice, technology deployed	Impacts, Scope
Integration of digital technologies into the curriculum: dialogues on challenges and difficulties (Scherer; Brito, 2020)	Campo Grande-MS	Integration of digital technologies into the school curriculum. Continuous training for teachers in the use of digital technologies for a dynamic and continuous integration process.	Improvement in pedagogical practice; Student engagement; Monitoring of the learning process; development of digital skills and reflection on pedagogical practices that demonstrated the enrichment of the curriculum, transforming teaching and learning experiences in schools.
Digital technologies as pedagogical resources in remote teaching: implications for continuing education and teaching practices (Aureliano; Queiroz, 2023)	Patu-RN	System applied during the pandemic. Teaching practice included digital technologies	Increased visibility of technologies; Inequality of access; new cultural identity; professional development and reflection and research. Opportunity for innovation and educational practices.
Use of digital educational resources by educators in the early grades of elementary school (Santos et al., 2022)	Marília-SP	Digital resources; Technology deployed	Increased digital competence; Concern with data protection; need for continuous training and reflection on pedagogical practices.

Source: Prepared by the authors with data from the research.

Santos et al. (2022) conducted studies on the use of digital resources by educators active in the early grades, in Marília, in the interior of São Paulo. Seeking to identify how these professionals have used the digital resources available in teaching-learning activities, comparing them with variables such as gender, age and time of work. Santos et al. (2022) applied questionnaires using the *DigCompEdu Check-In* tool to all teachers in the municipal school system in this location.

Santos et al. (2022) obtained about 1,348 questionnaires as results. For the author, it was found that teachers have used the internet to search for resources and adopt as a selection criterion the adequacy of the material to their students. As for the use

of digital resources, they are restricted to simpler activities, such as preparing presentations. It was found that most of the participants are concerned about protecting sensitive data and content, but they still need to improve their skills in relation to this issue. It is concluded that there is a need to complement the training of educators in the locality where the research was developed and that the results should inform the taking of actions in this direction.

It should be noted that the research was developed during the year 2022, the post-pandemic period, demonstrating that the sectors responsible for the management of municipal education have not sought to effectively implement technology and digital governance mechanisms, even after the easing of covid-19.

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According to Brasil (2018), despite the circumstances generated by Covid-19, discussions about the use of digital resources in the school context were already a demand because of the changes in the curriculum, determined by the official document: National Common Curriculum Base (BNCC). It is a document that is the national

reference for the formulation of the curricula of the school systems and networks of the States and Municipalities, pointing out impacts and a series of changes in education, with the purpose of ensuring equity in the teaching practiced in different regions of the country.

Ribeiro and Gasque (2015) report that the school and the teacher demand new roles to act in the digital society. In this way, the school must become a favorable space for the development of the learner with regard to the ability to learn how to learn, in which teacher training is relevant to prepare the individual to act in a safe, responsible and ethical manner in the face of current digital content and resources.

Bezerra (2020), in his studies, report that the challenges imposed on education, especially at the various levels of education, establish that remote technologies should be adopted as a teaching methodology. The institutions, in an emergency manner, had to adjust and adopt alternatives to mitigate the educational loss. On the other hand, the faculty had to seek access to digital resources in the development of teaching-learning activities, considering the impossibility of face-to-face classes due to isolation, to meet health protocols.

For Santos et al. (2022) it is necessary to assess that although the use of the internet is carried out by teachers, in different regions of Brazil, mainly for didactic-pedagogical purposes, it is part of their daily lives, however, it still does not occur in an institutionalized way, demonstrating that there is no strategic planning of use or sharing, an indispensable situation for the quality teaching and learning process.

Aureliano and Queiroz (2023) in their studies, indicate that the teacher is the professional responsible for the mediation of knowledge and, therefore, the reflective action must come from him, it must be present in his pedagogical practice. The authors report that the process of teacher reflection emerges from the needs and concerns and there is a need for the educator to think and rethink the development of his practice and, after its realization, to replan for the execution of a new reflected action, especially now in the post-pandemic period, where there was the implementation of several technological resources.

In this way, the author argues that digital technologies appear as an important resource in the effectiveness of learning, dialoguing between educator and student, both being builders of knowledge. Thus, the use of this tool allows a reflective process on the part of the teacher seeking to understand its functionalities and apply them in a meaningful and appropriate way. Also according to Silva (2019), it is up to the educator to

think and intervene in his pedagogical action, considering that teacher training is a "continuum" that is under constant construction. And, therefore, the globalized world demands this reflective teacher, who is prepared to deal with the demands of the educational context of teaching in which the use of new

Aureliano and Queiroz, in their investigations, detect that the Law of Guidelines and Bases of National Education - LDB (BRASIL, 1996, p. 18) is based on its Article 22 that:

"Basic education aims to develop the student, to ensure him the common training indispensable for the exercise of citizenship and to provide him with the means to progress in work and in further studies".

To this end, in Article 32 of the aforementioned law, the factors necessary for the formation of the individual in Elementary School are listed, one of them being the student's learning, emphasizing mainly the comprehension of reading and writing

Aureliano and Queiroz (2023) reinforce that despite the covid-19 pandemic, it is necessary to ensure the right to quality education, and therefore, with non-face-to-face teaching, establishing a practice with interaction and traditional methods for the acquisition of children's learning, has become complicated. Especially the literacy process. While the World Health Organization (WHO) together with health institutions, social distancing measures were determined in order to minimize the proliferation of COVID-19, through Laws, Decrees, Ordinances, among other official documents, on the other hand, schools were closed and remote teaching was implemented.

In their postulates, Aureliano and Queiroz argue that given the circumstances of the time, it was necessary to find a way for these children to carry out their school activities safely and that would avoid contamination by the imminent virus. In addition, to comply with the right to a public and quality education for all. With CNE/CP Opinion No. 05, of April 28, 2020, the possibility of non-face-to-face teaching was publicized as the viable way to comply with the minimum annual workload.

Aureliano and Queiroz investigate that this was a great challenge for public school teachers. The remote scenario has these weaknesses, as identified in the analyzed school, at the Francisco Francelino de Moura Municipal School, in 2020. Several impasses became clear, which went beyond the pandemic situation, such as: the lack of assistance from families, lack of access to technological resources, absence of an adequate space to attend classes at home, as well as the exclusion of children with

disabilities, among other factors that hinder the effectiveness of the teaching-learning process in the experience of remote school teaching

For these authors, the difficulties were effective and in many moments, the resolution was unreached by the educator. However, despite the adversities, it is necessary to highlight that the application of this remote teaching method was a viable way to execute the teaching processes aiming, mainly, at the protection of people's lives resulting from the COVID-19 pandemic, as well as the insertion of digital technologies were a predominant resource that helped teachers, students and families in the development of activities.

Chart 3 - Systems and Practices of Governance in Education implemented at the State level

Article	Locality	System, practice, technology deployed	Impacts, Scope
Educational governance in a pandemic scenario: mapping public actions in the state of Amazonas (Silva et al., 2023)	Amazon	Virtual platforms, mobile apps, videos, pdcasts Remote teaching; adaptation of printed material to digital; virtual service and training for the use of technological tools.	Marked inequalities; change in teaching models; training and teaching work. The program developed partnerships and collaboration with other sectors, as well as the outreach of educational initiatives

Source: Prepared by the authors with data from the research.

Silva et al. (2023), in their analyses of the state of Amazonas, noted that the 'Aula em casa' program was implemented, which made it possible to reach 4 million students in isolation, starting from an initial content created for 40 thousand students. The survey identified the lack of structure and effectiveness of public policies.

Silva et al. (2023) carried out studies that analyze the design of educational governance for Basic Education, in the first year of the pandemic caused by Covid-19, in the State of Amazonas, through analyses of decision-making by the public authorities on the teaching of the municipal and state networks in the period from March 2020 to February 2021.

In their studies, Silva et al. (2023) found that in the first year of covid-19, the State of Amazonas made decisions about Education predominantly, in establishing governance based on axes that were about experimenting with remote models, whether at a distance, in a hybrid way, based on the oscillations of progress and containment of the pandemic, as well as around the training and work of teachers, emphatically visualizing the precarious conditions in which these professionals began to face with the circumstances

generated, that is, instability between face-to-face and remote teaching and in facing the contradictions and social and educational inequalities, inherent to the Amazonian context, in which children and young people enrolled in schools in the municipality and State of Basic Education suffer and were aggravated during the pandemic.

This period clearly showed that, despite proposing a new modality of the teaching-learning process, social inequality and scarcity in the structure of the technological apparatus, problematized education in the municipal and state spheres in Brazil.

Chart 4 – Systems and Practices of Governance in Education implemented at the national level

Article	Locality	System, practice, technology deployed	Impacts, Scope
Citizen participation: the digital governance gap in education agencies and foundations in Brazil (Gomes; Moreira; Silva Filho, 2019)	National	Communication: Websites, feedback and popular consultation	Challenges in promoting citizen participation; the use of ICTs as strategic tools for organizational planning
Technologies and school education: can the school be contemporary with its time?	National	Technologies and practices are carried out with the evolution of education and the search for methods that make teaching more effective and contemporary in relation to social and cultural demands.	Expansion of access to Education; Transformation of pedagogical practices; development of new skills and change in school culture over time.
Teaching work in times of pandemic: another portrait of Brazilian educational inequality	National	It presents operational and methodological aspects of the research with 15,654 teachers from the country's public school systems and whose data were collected through an electronic form	Identification of the variation of conditions between public school systems and the relative work overload of teachers

Source: Prepared by the authors with data from the research.

The study by Gomes, Moreira, and Silva Filho (2020) measured the level of digital governance in 108 public organizations, including National Institutes, Federal Institutes, and Universities, revealing that most of them still have significant gaps in relation to good digital governance practices. The results of this study reveal that the greatest shortage to achieve digital governance in Brazil is in the adoption and implementation of social participation mechanisms on platforms, such as means of feedback and popular consultation.

It should be noted that Gomes, Moreira and Filho (2023) clarify that it is necessary to comply with the good practices identified in the applied scale is not a matter of merit or organizational strategy, but an obligation provided for in legislation, especially regarding the Access to Information Law.

The authors suggest that the expectation would be that 100% in relation to compliance with good practices. However, this was not what was observed, highlighting that it is not only at the municipal and state levels, but there are also deficiencies related to digital governance in institutions at national levels. Several factors were evaluated in the survey, mainly practices related to content, services, usability and accessibility. The indices around the organizations in the sample reached, on average, 87.66% in relation to compliance with associated practices regarding the provision of content in digital media; about 87% in relation to practices of offering public services in the digital sphere; and approximately 83.33% regarding practices associated with usability and accessibility on its platforms, with INEP being the agency that achieved the highest average in relation to the parameters evaluated.

The results found by Gomes, Moreira, and Filho (2023) reveal that the Southeast region is the location that most concentrates organizations, however, the Midwest concentrates, proportionally, the largest number of level A organizations (highest digital governance score). The adoption of social participation mechanisms on platforms, such as means of feedback and popular consultation, is the main practice that must be established to achieve better rates and development of digital governance. It is a measure that is in the implementation of e-democracy.

Oliveira and Junior (2020), in the development of studies on the circumstances faced by Education in the face of the covid-19 pandemic, found that the pandemic not only highlighted the well-known social, racial, regional, and educational inequalities that the country harbors, but also deepened the disparity between social classes and increased the gap between the richest and the poorest. In this way, this complex and challenging situation ranges from the lack of access to technological support for professionals as well as students.

Oliveira and Junior (2020) report that the inexperience of teachers and the lack of prior training and qualification for the use of technologies, for the development of remote work, as well as the vulnerable situation of many student families, are obstacles that prevent the development of effective digital governance. It should be noted that proposing

resources for access to research can contribute to seeking solutions to reach a better future, since the present has often been troubled with regard to these issues.

Establishing scientific knowledge becomes indispensable to the involvement of the subjects inserted in this context. That is, it is necessary to carry out dialogues with school communities, both with students, families, education professionals, union representations in order to find significant mechanisms for the arrival of these digital improvements in education, respecting the limitations and conditions imposed.

CHALLENGES FOR THE EFFECTIVE MATERIALIZATION OF DIGITAL GOVERNANCE IN EDUCATION

Chart 5 - Challenges pointed out by the studies for the materialization of DG in education

Article	Challenges
Gomes; Moreira; Son (2020)	Promote citizen participation in digital government, inequality of access and management of interactive spaces that arise from citizen participation, which is crucial to achieve accountability.
Silva et al. (2023)	Inequality in access to Technology; the instability in teaching models; the working conditions of teachers; The complexity of educational governance made it difficult to effectively coordinate actions.
Santos et al. (2022)	Lack of adequate training to effectively integrate digital technologies; limited use of digital resources; resistance to change; lack of infrastructure and access to quality internet, as well as technological devices, in addition to inequality in access.

Source: Prepared by the authors with data from the research.

For Gomes, Moreira and Filho (2020) there are several contemporary challenges for the establishment of digital democracy. These authors demonstrate that even in portals directly oriented to the promotion of successful practices with the objective of achieving: "democratization of access to information and expansion of citizen participation", as suggested by the work of Freitas, Lima, & Lima, (2015, p. 639), is a complicated task. The practical example is the e-Democracy portal, of the Chamber of Deputies, in which the participation of the deputies themselves inserts limitations. (Leonnel, Costa, Tonelli, Leme, & Amâncio, 2018, p. 213)

Gomes, Moreira and Filho (2020) despite the initiatives aimed at encouraging popular participation, the scope is still limited. This minimizes political decisions directly, for numerous reasons, and reinforces that the incorporation of information and communication technologies alone does not effectively guarantee democratic participation.

When evaluating the educational sphere, Santos et al. (2022) in their studies, find that it is important to invest in the Brazilian educational system, especially in relation to teacher training. There must be training aimed not only at the development of the technical aspect of the use of technologies, but also to prepare professionals to make decisions about how such practices should be used pedagogically.

Therefore, several actions are needed to transform digital governance as a whole. Gomes, Moreira, and Filho (2020) point out that for the public manager, incorporating technologies considerably into the provision of services is essential. The transparency that must be included in the gap in action of public organizations is called "e-democracy". Direct interaction between citizens and government is a strategy for the latter to make more collective decisions and, thus, face public challenges. Denying these interactions is not inserting means for manifestation in government platforms, reducing information of strategic potential.

For Gomes et al. (2020), it is necessary to promote mechanisms that provide development about political decisions based on interactions between government and citizens. For education organizations, such as those participating in this study, it is to be expected that a large part of their digital services, offered to users in the form of electronic bulletin boards (such as dissemination of results, consultation services, issuance of documents, etc.), will remain unchanged.

Santos et al. (2023) develop that one of the main reasons that prevent effective governance development is inequality in relation to access to the internet and technological resources, with a clear discrepancy of class, race and ethnicity, gender, and geographic location. According to Kenski (2015), when analyzing the impacts of the liberation of the internet in Brazil in the last 20 years, he already reflected on the limits of the national experience: the inequality in the conditions of access and the use of resources and devices available on the internet.

Santos et al. (2023) also reflect that the difficulties of developing coherent educational governance are extremely complex. For the author, the pandemic period has exposed social and educational inequalities, decentralization of educational management accompanied by unilateral accountability between federated entities.

To this end, in addition to structurally equalizing the mechanisms of information and communication technology to enable digital governance, it is extremely necessary to reduce the conditions of inequalities that are predominant in Brazil. It is not enough to

improve platforms and websites, to include spaces for digital public opinion, when in practice, society in its majority, still does not have access to these fields of debates and opinions.

FINAL CONSIDERATIONS

The analysis of digital governance practices and/or systems in education in the national scenario, based on the selected articles, made it possible to identify few advances regarding the use of information and communication technologies in Brazilian education. Although the pandemic period determined that the production of education should change at the time, opting for the remote modality, it was highlighted that Brazil, in general, still does not have the technical and technological preparation to operate effectively with technologies,

Based on the analysis of the selected articles, it is highlighted that in all spheres, whether municipal, state or national, it is still necessary to improve and develop practices that can add to Education as a whole. In none of the cases analyzed, was there a Department of Education that fully subsidized the teaching-learning process through digital governance.

For the materialization of digital governance in Brazilian education to occur, a solid educational planning is required, which considers several fundamental aspects, such as: the reduction of social and technological inequality, the presence of an adequate technological infrastructure, the training of education professionals, the student body and the community, as well as the establishment of the guarantee of information security.

The technological disparity that exists in educational institutions is evident, even at national levels, when the premises of digital governance are sought. It is essential to develop comprehensive digital inclusion plans, offer continuing education to educators and establish strategic partnerships with companies and institutions, aiming to ensure access to technologies.

Digital governance is considered an expanding field that offers benefits to public administration and society in general, as well as enabling the construction of e-democracy, whose collective participation must be integrated and accessible. However, for it to be effectively implemented, it is necessary to propose the reduction of social and digital inequalities, so that the whole society in all its spheres can have access. In

addition, there needs to be training, modernisation, security and digital inclusion that ensure that all citizens have equal access to digital technologies.

Digital governance in education in Brazil can still be considered a growing topic and under constant discussion. The analysis of the selected articles demonstrated the importance of integrating technological systems in school management and pedagogical practices, as well as raising questions about the effective participation of school actors, especially after the pandemic period that signaled that other modalities of education production should be available in contemporary times (remote teaching).

It is clear that digitalization in education can promote more inclusive and quality education, enabling significant improvements in the teaching-learning process. It is essential that the Brazilian Departments of Education continue to seek investments and solutions that establish digital governance systems and practices, aiming at an education that is more adapted to current demands and preparing students for the challenges of the digital world, since it is about compliance with rights provided for by law.

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