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Socio-technical imaginaries and the future of teaching: how discourses of digital transformation reconstitute social practices from the present

Imaginarios sociotécnicos y futuro de la enseñanza: cómo los discursos de transformación digital

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Abstract

This study aims to analyze the discourses of teacher digital transformation disseminated by reference documents in the educational field, discussing the socio-technical imaginaries they promote in relation to the technosolutionist perspectives of the Brazilian educational context. An exploratory study based on Norman Fairclough's Critical Discourse Analysis method examines four documents by different authors, namely The End of School as You Know It: Education in 2050, by European EdTech GoStudent; Working and learning together, by the Organization for Economic Cooperation and Development (OECD); the *Estratégia Brasileira de Inteligência Artificial, by the Ministério da Ciência, Tecnologia e Inovações do Governo Brasileiro; and the Recomendações para implementação da BNCC Computação, by the Fundação Telefônica Vivo*. Semantic fields emerge from these materials, such as technological solutionism, in which teachers take on the role of *coaches,* while non-teachers provide specialized knowledge to students together with technology; at the same time, it guides the formation of digital skills in teachers in the present, making them a tool for accessing digital resources, in the present to make this future possible. Teaching, in an idealized future amidst the dynamics of digital privatization, is presented as separate from pedagogical decisions (to be made by algorithms), and restricted to motivating students' socio-emotional skills; at the same time, however, concerns are identified about the development of basic digital skills by teachers today, especially in the Brazilian scenario. The study corroborates the perception that discourses, more than texts, are ways of structuring social practices, which constitute conventions and norms, with the references analyzed manifesting socio-technical imaginaries, constituted in digital governance networks, which project a re-signification of teaching in a context in which education is situated as inseparable from digitalization.

Keywords: Education policies; Digital governance of education; Educational technosolutionism; The teaching profession.

Resumen

Este estudio tiene como objetivo analizar los discursos de transformación digital docente difundidos por documentos de referencia en el ámbito educativo, discutiendo los imaginarios sociotécnicos que se promueven en relación con las perspectivas tecnosolucionistas del contexto educativo brasileño. Es un estudio exploratorio basado en el método de Análisis Crítico del Discurso de Norman Fairclough que examina cuatro documentos de diferentes autores, a saber: The End of School as You Know It: Education in 2050, de la EdTech europea GoStudent; Working and learning together, de la Organización para la Cooperación y el Desarrollo Económico (OCDE); la *Estratégia Brasileira de Inteligência Artificial, del Ministério da Ciência, Tecnologia e Inovações del gobierno brasileño; y Recomendações para implementação da BNCC Computação, de la Fundação Telefônica Vivo*. De estos materiales surgen campos semánticos, como el solucionismo tecnológico, en el que el profesorado asume el papel de entrenadores y entrenadores, mientras que el no profesorado proporciona conocimientos especializados al alumnado junto con la tecnología; al mismo tiempo, orienta la formación de competencias digitales en el profesorado en el presente, convirtiéndolos en una herramienta de acceso a los recursos digitales para hacer posible este futuro. La enseñanza, en un futuro idealizado en medio de la dinámica de la privatización digital, se presenta separada de las decisiones pedagógicas (tomadas por algoritmos), y restringida a la motivación de las habilidades socioemocionales del estudiantado; sin embargo al mismo tiempo, , se identifican preocupaciones sobre el desarrollo de habilidades digitales básicas por parte del profesorado actualemente, especialmente en el escenario brasileño. El estudio corrobora la percepción de que los discursos, más que textos, son formas de estructuración de las prácticas sociales, que constituyen convenciones y normas, siendo que las referencias analizadas manifiestan imaginarios socio-técnicos, constituidos en redes de gobernanza digital, que proyectan una re-significación de la enseñanza en un contexto en que la educación se sitúa como inseparable de la digitalización.

Palabras clave: Políticas educativas; Gobernanza digital de la educación; Tecnosolucionismo educativo; Profesión docente.

1. Introduction

The socio-political and economic changes brought about globally by the Covid-19 pandemic have had an impact on different social segments. In education, the reorganization of pedagogical dynamics, which included remote and hybrid formats, reinforced the perception that all problems can be solved using digital resources, articulating what Morozov (2018) calls *technological solutionism* or *technosolutionism*. The techno-utopian premises of this concept understand algorithmic regulation as a pragmatic and objective way - based on answers pre-formatted by codes, sensors and artificial intelligence - of solving socio-historical problems, ignoring their complexity and interpreting reality through monocausal perspectives. This would guarantee the quality of all *services*, depoliticizing social problems while increasing digital surveillance and control and consolidating dependence on these resources, which are concentrated in the private sector.

Different periods have their own attempts *to transform education*, with the digital transformation, as an ongoing phenomenon, being constituted, as Saura, Adrião and Argueiro (2024) discuss, by *digitization*, indicated as the adoption of technologies in education policies and practices, and by *datification*, that is, the production of data from educational practices, behaviors and actions. As the authors argue, after the 2008 crisis, this movement intensified, becoming even more widespread with the Covid-19 pandemic. Educational reforms have started to include these elements as a priority, not least because of the recent advances in Artificial Intelligence, especially ChatGPT (Saura; Adrião; Arguelho, 2024). In this context, transformations in teaching practices are required, imposing new conceptions and ways for teachers to exercise their profession.

In this study, we start from the premise that teaching is also re-signified by the discourses that are disseminated about technological solutionism in education, promoted by EdTechs, international organizations, foundations and institutes dedicated to directing public policies and by the state itself. The aim of this research is to analyze the discourses of digital teacher transformation disseminated by reference documents in the educational field by these actors, discussing the socio-technical imaginaries they promote in relation to the technosolutionist perspectives of the Brazilian educational context. It is understood that these processes, rather than influencing the purchase of platforms and other digital resources by education systems (seen as a way of updating and guaranteeing the quality of their pedagogical processes), have an impact on the way education, its objectives and its functions are conceived in this specific scenario.

An exploratory study based on Norman Fairclough's Critical Discourse Analysis method examines the documents The End of School as You Know It: Education in 2050, by European EdTech GoStudent; Working and learning together, by the Organization for Economic Cooperation and Development (OECD); *Estratégia Brasileira de Inteligência Artificial* (Brazilian Artificial Intelligence Strategy, in own translation), by the *Ministério da Ciência, Tecnologia e Inovações do Governo Brasileiro* - Brazilian government agency; and *Recomendações para implementação da BNCC Computação* (Recommendations for implementing the BNCC[1] Computing, in own translation too), by the Telefônica Vivo Foundation. The different types of actors who conceive the documents come from different positions on the future of education and teaching, broadening the scope of the investigation. To support its examination, the theoretical foundations of this research

1 *Base Nacional Comum Curricular* or National Common Curriculum Base, in English - the main state document guiding curricula.

are presented first, followed by a clarification of the methodological procedures and the construction of the argument.

2. The processes of educational privatization and digital solutionism

The rise of Big Tech is diagnosed by Morozov (2018) as a symptom of the global economic crisis, having been facilitated by global elites who aim for a "[...] political and economic compromise" (p. 145, own translation[2]) that provides financial recovery with more profitability. With the spread of the logic of digital solutionism, the implementation of digital platforms, artificial intelligence and Big Data has become a technical and neutral solution to complex contemporary issues, whether they are social, political, environmental or ethical. Concentrated in very specific groups, which are sovereign in the mastery of these resources and are eager to commercialize them, digital technologies are referred to as if the well-being and progress of society depended on them (Morozov, 2018).

And in their eagerness to meet these digitalization expectations, governments have formulated and implemented policies aimed at including these technologies, which ends up making them dependent on Big Tech and its tools. The field of education has been exposed to these processes even more intensely with the Covid-19 pandemic, which has forced an accelerated adoption of digital resources so that education systems can adapt their face-to-face dynamics to remote and hybrid modalities. As a result, hitherto analogue education privatization processes (aimed at redirecting the public agenda towards the insertion of managerial precepts and the sharing and sale of private products and services to the public sector) have reshaped their actions and started to include governance movements based on technological tools (Saura; Cancela; Parcerisa, 2023).

It is worth noting that Google, a leading corporation in actions that seek to *innovate* education, had already been developing services in the past, with "Google G-Suite for Education" having been launched in 2006 and replaced in 2021 by "Google Workspace for Education". Its package of solutions, which included Google Classroom, had been disseminated since then, with its technological structure being constituted and present on the political agenda before the pandemic, and bringing implications. In their study, Saura, Díez-Gutiérrez and Rivera-Vargas (2021) identified, with the use of Google Classroom, its potential as a tool for educational control, while at the same time implementing new data extraction dynamics and favoring the private group, which gained an advantage due to its cordial relations with public institutions.

Latin America is following these movements, with its governments making efforts to keep up with the digital transformation propagated in European and North American countries (and by their corporations) in order to avoid the digital divide - social differences that are established in countries with and without access to certain resources. Bonilla, Ficoseco and Jiménez (2024) problematize that, in a globalized scenario, the counter-hegemonic perspectives of the countries belonging to this group end up being detailed, with perspectives from the global North prevailing, not least because of their historical dependence on its technologies. Its materialization brings with it contradictions that are propagated, among other elements, in teacher training, which is generally insufficient and instrumental, affecting teacher performance.

2 In the original text: "[...] compromisso político e econômico" (Morozov, 2018, p. 45).

As Saura, Cancela and Parcerisa (2023) explain, these changes follow the dynamics of capitalism itself, which is expanding in this digital age. A capitalism that is not another, but which is continually expanding to overcome its crises and maintain its domination, including, in contemporary times, digital transformations and which "[...] expands in and through educational systems, through the digital privatization of education" (Saura *et al.*, 2024a, p. 141, own translation[3]). To support the construction of reflections on these advances of contemporary capitalism, specifically in terms of their implications for global educational policies, Saura *et al.* (2024a) develop a theoretical-conceptual apparatus based on the triad of democracy, state and ideology.

The authors reflect on how democratization develops in a specific way under neoliberalism, in social relations that limit democracy itself, and in educational contexts, its movements are subject to corporate matrices constituted by privatization processes, which disarticulate decisions from the protagonism of the contexts. As a result, democracy is not conceived as a process historically constructed in the experiences of individuals, but as an abstraction, which, with the expansion of digital goods (generally based on automation that can be linked to governance) requires reflection on these resources from a democratic sovereignty perspective.

The concept of social relations also defines the state in the argumentative construction of these researchers, because what was once understood as an institution has increasingly materialized through political networks, now also constituted by digital governance, which are made up of different actors, not always articulated only to state spheres (as Saura, Cancela and Parcerisa, 2023, explained). Recent political configurations, such as the 2008 crisis and the Covid-19 pandemic, have proliferated the actions of these subjects who have multiple forms and interests, with technology corporations, think tanks and startups, through their technological tools based on large volumes of data and algorithms, increasingly articulating themselves with international organizations and philanthropic foundations that were already part of the decision-making processes on the public agenda. According to Saura *et al.* (2024a, p. 144, own translation[4]), when thinking about what the state is in contemporary capitalism, the relations between the public and the private are considered, which "[...] are sustained by ideological determinations that are part of the broader social and economic changes that are configured through class processes, always in relation".

And this ideology, catalyzed in the digital age, is synthesized by Saura *et al.* (2024a) with the concept of sociotechnical imaginaries, by Sheila Jasanoff (Indo-American researcher in the field of Science and Technology), which refers to a vision of the future built collectively based on what is desirable. But when analyzing the advances of digitalization in the educational context, especially after the Covid-19 pandemic, the authors warn of a re-signification of this understanding. In another article, Saura, Cancela and Parcerisa (2023) diagnosed a kind of subversion of this concept, which is now defined by these authors as programmatic socio-technical imaginaries (global and/or national strategies that are implemented in education based on specific perceptions of development) and mercantile (images shared by private groups linked to the technology industry to articulate their products to what they conceptualize as the future of society and, consequently, of education).

3 In the original text: "[...] se expande nos e através dos sistemas educacionais, por meio da privatização digital da educação" (Saura *et al.*, 2024a, p. 141).

4 Original text: "[...] são sustentadas por determinações ideológicas que fazem parte das mudanças sociais e econômicas mais amplas que se configuram através de processos de classe, sempre em relação" (Saura *et al.*, 2024a, p. 144).

These symbolic constructions, disseminated as certain predictions, are presented as a means of identifying how capital, through processes of domination and power, materializes its expectations in education (Saura *et al.*, 2024a). This ideology is not separate from contemporary conceptions of democracy and the state and, from the perspective of this study, also influences the visions of teaching *for the future* reproduced in policies and documents that express programmatic socio-technical imaginaries through guidelines for education drawn up by a billionaire EdTech company, an international organization, the Brazilian state and a philanthropic entity linked to the private sector. In addition, this conceptual triad demonstrates how actors linked to the digital market have related to the public and philanthropic sectors, reconstituting democratic processes based on specific ideological biases, which include teaching in the idealizations portrayed by their guidelines.

In an attempt to document developments from this perspective, different researchers have investigated how teaching is situated in the face of these *futuristic* imaginaries. Ideland (2021), when analyzing discourses related to EdTech and the profile of the teacher imagined to work in a digital classroom, identified an idealized vision - which is also present in the development of educational products and in the very way of interpreting education in a society referred to as highly technological, as the author makes clear. Her study concluded that the *culture of Silicon Valley*[5] disseminated among the so-called *edupreneurs* the expectation that digital resources would make teachers dedicate themselves to motivating students (with a role similar to that of a *coach*), personalizing their educational path (understood as an individual construction) and attending to them in a flexible way (at school or not; on school days and times or not), according to their needs - with constant *feedback*. This is because the technologies would be used in processes mentioned as *bureaucratic*, in student assessment and in documenting the teaching routine.

In his analysis, he reverberated the perspective that digitalization in educational contexts would result in a *googlified* teacher - someone familiar with platforms and willing to use them - who is more concerned with *soft* skills and *value skills*, which focus on leadership, proactivity, creativity and innovation, and less on specific skills, focused on technical knowledge. Those interviewed by Ideland (2021) reported that a class shared by a whole group of students in the same room (as is the case today) would be outdated, and that there should even be a greater number of teachers in institutions to *make it easier to* monitor the personal learning paths developed by students, simulating more horizontal relationships like those of a network society. In these discourses, there would be less bureaucratization and control, and more flexibility and autonomy for teachers in digital classrooms (Ideland, 2021).

When analysing the interest in applying technologies linked to Big Data in US education, Roberts-Mahoney, Means and Garrison (2016) also identify the trend towards personalization, which they refer to as *Netflixing* - in reference to the *streaming* service. In their analysis, they point out that student preference data would be collected and stored by digital resources, making it possible to guide their teaching processes based on individual expectations. In addition, the authors warn, this data will become an object of profit insofar as it is of interest to corporate entities linked not only to the techno-educational market.

5 It is characterized by a belief in technology associated with precepts such as entrepreneurship, flexibility and creativity. In the article, Ideland (2021) also associates this concept with flat hierarchies in management, with Google being one of the companies that prides itself on following these premises.

The scenario investigated by these authors places the teacher in charge of two functions. The first, which is close to Ideland's (2021) perspective, sees the teacher as a *coach* who must guide students so that they learn based on their interests and by the means that seem most convenient to them, helping them in their decision-making. And the second is that of a data collector, insofar as they accompany students in their dedication to the platforms on which pedagogical decisions are made by algorithms. Technology and even non-teachers (experts on whom the student's activities are based, whether mediated by digital resources or not) are seen as more relevant than the teacher, who becomes just a link between the subjects and the platforms (Roberts-Mahoney; Means; Garrison, 2016).

This reframing of teaching, however, has implications. As Roberts-Mahoney, Means and Garrison (2016) emphasize, "[...] personalized learning technology favors reductionist, mechanistic, linear, anti-intellectual, anti-relational, and prescriptive approaches to teaching and learning" (p. 13). They use an instrumental approach, in which the teacher themselves becomes a *tool*, to the extent that digital resources are seen as responsible for learning. This perception is also highlighted by research such as that by Knox, Williamson and Bayne (2019), which indicates a return to behaviorism[6] with the adoption of this dynamic, with a simplification of the very concept of learning, restricting it to conditioning, in the narratives on which the technologies are based.

These theoretical constructions express points of departure that contextualize the analysis of the discourses present in references that modulate the educational agenda, contemporaneously pointing to a necessary (and urgent) digital transformation. In doing so, the set of documents selected for this study also situates a specific dynamic for teaching in a future linked to the presence of resources such as Artificial Intelligence, Virtual Reality and the Internet of Things in the classrooms of educational institutions, including public ones in emerging economies marked by inequality, as is the case in Brazil.

3. How do discourses on digital transformation portray the *teacher of the future*?

Understanding that socially-constituted conceptions of the state and democracy express ideologies which, at the same time, have propagated the idea that education in the future will develop from digital resources, with a technosolutionism solving its problems, this section identifies and compares discourses that address the teacher characterized in this scenario. Discourse, for Fairclough (2001), is not characterized as an individual or situational phenomenon, but as a social practice. As such, it becomes a form of action on the world and on others, as well as being a mode of representation and signification. A discourse is constituted in dialectic with the social structure, in its norms, conventions, relationships, identities and institutions, as a "[...] mode of political and ideological practice" (p. 94, own translation[7]), by establishing, affirming and transforming power relations and also naturalizing, maintaining and altering their meanings.

6 A concept popularized by the American psychologist Burrhus Frederic Skinner, referring to the modulation of behavior through repetitive punishments and incentives. More information can be found in one of his main works, *Science and human behavior*, first published in 1953, available at: https://www.bfskinner.org/newtestsite/wp-content/uploads/2014/02/ScienceHumanBehavior.pdf .

7 In the original text: "[...] modo de prática política e ideológica" (Fairclough, 2001, p. 94).

Three stages are defined by the British linguist to analyze a discourse, following the triad that characterizes it. The first step involves *textual analysis*, which explores the linguistic structure of the text and identifies power relations, ideologies or implicit assumptions in its linguistic elements. This is followed by *discursive practice analysis*, which examines the processes of production, distribution and consumption of this discourse in order to verify how it challenges or reaffirms certain social practices. And finally, *social practice analysis* should be carried out, which relates the elements of discourse to social structures, questioning inequalities, power relations and the way in which it ratifies or alters the prevailing social order. These movements will be used to analyze four types of documents, which indicate the ways in which teachers are projected into *the future*.

Before going into this process, it is important to situate the nature of these documents and their authors, which portray forms of governance based on political networks that articulate groups with different configurations, but which share the objective of reshaping education systems for a future characterized as digital (Saura *et al*., 2024a). Made up of an *EdTech*, an international organization, a philanthropic entity and the state itself, this group of organizations with different identities disseminates unique socio-technical imaginaries (Saura; Cancela; Parcerisa, 2023). Coming from different institutional spaces, with the former involved in guiding educational policies at a global level and the latter focused on the Brazilian scenario, they denote the materialization of a notion of the state which, based on contemporary capitalism, comes to be understood as a social relationship (Saura *et al*., 2024a). In it, the public and private constitute a governance sustained by ideological determinations that express social and economic changes, which are currently based on versions of the future commanded by technology, which directs their investments and actions (Saura; Cancela; Parcerisa, 2023).

These interrelations materialize in techno-educational agendas that intertwine the objectives of national and global entities (and vice versa), both public and private. Due to the complexity of their compositions, Saura *et al* (2024b) classify the way in which those considered private (and which tend to be understood as one in academic analyses) are constituted into different typologies. As the authors put it, there are private actors linked to Big Techs, which are large global corporations (such as Meta, Google and Microsoft) and do not have the field of education as the center of their business, but develop technologies that disseminate (and accompany) ideological discourses of digital transformation in education. Another typology is that of "[...] companies of significant size that differ from Big Tech in that they are corporations that operate mainly in the education markets" (p. 23, own translation[8]), such as GoStudent and Coursera. And those associated with the EdTech financial industry by being involved in investment funds, financial conglomerates, startup accelerators and venture capitalism, such as HolonIQ and Crunchbase (Saura *et al*, 2024b).

In this discussion, the inclusion of a document from GoStudent represents the socio-technical imaginaries of the teacher *for the future of* the EdTech industry, a platform that offers online tutoring and where anyone over the age of 18 can sign up to become a *teacher* (with no minimum training requirement). The OECD (Organization for Economic Cooperation and Development) denotes the ideological perspectives that international organizations have defended by influencing the educational policies of different countries based on their socio-political and economic conceptions. The Ministry

8 In the original: "[...] empresas de dimensiones significativas que se diferencian de las Big Tech, al ser corporaciones que operan principalmente en los mercados de la educación" (p. 23).

of Science, Technology and Innovation represents government actions and its involvement in the debate on the potential of using AI and its role in developing research, innovation and solutions. And the Telefônica Vivo Foundation makes explicit the way in which collaborative communities have been formed, specifically in the Brazilian context, led by actors who call themselves philanthropic and who aim to direct educational policies and practices based on the trajectories of private sector *entrepreneurs* and their business solutions to complex problems (Estormovski; Albrecht da Silveira; Zardo Morescho, 2022).

These actors constitute relationships, direct or otherwise, by disseminating programmatic socio-technical imaginaries (Saura; Cancela; Parcerisa, 2023) that link the future of education to technological solutionism, as will be discussed in the following topics, which analyze their textual and discursive constructions, and then discuss their implications for the constitution of social practices regarding teaching projected in their guidelines.

3.1 Socio-technical programmatic imaginaries of teaching in the discourses of global actors

The first document selected is entitled The End of School as You Know It: Education in 2050, by GoStudent, characterized as the first European unicorn[9] in the EdTech sector. The material sets out a ten-year panorama with very futuristic implications: it mentions the adoption of Artificial Intelligence in education in the 2020s; the autonomous performance of tasks by AI from 2030 onwards; the popularization of the Metaverse in the 2040s, with immersive learning overlapping physical and digital worlds; and, in the 2050s, it foresees human-brain integration, in which knowledge will belong to a group and can be downloaded directly to the subjects. There would be no physical classrooms and no language barriers (with instant translation accompanying speech), with a specific connotation of teaching.

For EdTech, in the future, "Teachers will move upstream from a facilitating role to a personal coaching role, on-hand as a guide to the learner, to help co-pilot alongside AI-assistance. Additionally they will take on the responsibility of nurturing the mental and emotional wellbeing of students" (p. 5). His perspective is that genetics will be integrated with AI to identify learning strategies, and it is also AI that will define learning themes and rhythms, with pedagogical decisions not being listed among the teacher's responsibilities. "The more technical and vocational our 21st century essential skills become, the more likely it is that people will learn by experience and not by explanations" (p. 15), GoStudent justifies. At the same time, however, the material indicates that highly knowledgeable professionals (referred to as non-teachers) would favour the personalization of learning, promoting student access to the disciplinary knowledge identified as being of interest in their personal journey.

In Working and learning together, the future is presented as linked to advanced technologies, while at the same time being uncertain and constantly changing, requiring training so that students, from the present, develop both flexibility and mastery of digital skills. He provides guidelines for rethinking what he calls the *human resources* for schools, in which he reflects on how changes should be thought of in policies, since reforms don't always guarantee the expected benefits, tend to take a long time to be implemented and cause resistance among groups who feel disadvantaged by them. This perception denotes his experience in proposing solutions for educational systems and his concern for actually implementing them, which reverberates in his main strategy

9 Designation of startups that reach a market value of 1 billion dollars (Carrilo, n.p.).

for developing the digital competences expected in teachers: *coach* processes between teachers (OECD, 2019, p.31).

> The majority of skills required of teachers are not easily transmitted in a set number of training days. Therefore, regular coaching, mentoring and collaboration opportunities hold particular promise for promoting reflection and practice improvement among teachers. The critical aspect is that such ongoing learning experiences are aligned to school (and potentially system) goals.

It doesn't specify as many futurisms in teaching as GoStudent's proposal, but it does indicate the imminent development of digital skills by teachers. To this end, it points to the introduction of constant teacher assessment, the inclusion of technologies to meet bureaucratic demands, initial training processes with greater practical incursion, and *the coaching of* more experienced teachers with better results to help others with greater difficulties, in order to develop the skills required to master these resources among current professionals. In addition, in order for teachers to effectively implement the changes he recommends, he proposes linking their results to financial advantages: "[...] performance-based compensation is meant to motivate teachers to improve their practice and raise students' achievement by rewarding effective teaching" (p. 23), seeking to accelerate and guarantee this process.

3.2 The digital transformation of teachers in the discourses of actors centered on the Brazilian context

Including Brazilian documents in the analysis, we look at the *Estratégia Brasileira de Inteligência Artificial* - EBIA, which, following a trend also identified in other countries[10] , seeks to design the future based on qualifying access and incorporating digital resources into the different social segments. EBIA places educational policies among the priority areas with a view to promoting social benefits from scientific advances and solving problems through technology. The future is referred to as being dependent on Artificial Intelligence, with technologies being indicated as responsible for scientific progress and as a means of solving problems, with children and young people being the human capital of tomorrow and therefore having to develop digital skills.

The EBIA mentions that, for the students who will make up *this century's* workforce, mastery of digital communication tools and the use of networks, with the critical evaluation of information, would be basic to training, but would be little addressed in the Brazilian educational context. Digital literacy (a term used in the document to associate these and other skills for using these resources) needs to be included in teacher training so that it can become a pedagogical tool. Mentioning documents from the OECD, another international organization - Unesco (United Nations Educational, Scientific and Cultural Organization) - and the BNCC (National Common Curriculum Base - a state document guiding curricula) as references, it indicates that it is necessary to:

10 Saura, Cancela and Parcerisa (2023) mention how the Spanish government has launched documents such as Estrategia Nacional de Inteligencia Artificial, España 2026 and España 2050, with similar objectives to the Brazilian document analyzed.

> [...] advance discussions on topics such as digital educational resources, adaptive platforms, innovative pedagogical practices and the importance of reframing teacher training processes to deal with the challenges arising from the inclusion of technology and AI as a pedagogical tool in the classroom (p. 28, own translation[11]).

However, it highlights the "[...] need to review and define the role and skills required of teachers, taking into account that human interaction and collaboration between teachers and students remains a central aspect of education" (p. 28, own translation[12]). For this reason, among its strategies, it indicates both instrumental and socio-emotional aspects, as when it recommends "[...] instituting technological training programs for teachers and educators" while at the same time proposing "[...] encouraging the development of interpersonal and emotional skills, such as creativity and critical thinking (*soft skills)*". It also proposes "[...] evaluating the possibility of updating the BNCC so that it more clearly incorporates elements related to computational thinking and computer programming" (p. 30, own translation[13]). This last strategy was put into effect with the publication of the supplement to the National Common Curricular Base, or *BNCC Computação*, in 2022 by the *Ministério da Educação* - Ministry of Education, which lists premises, axes, objects of knowledge, competences, skills and explanations about them, with the Telefônica Vivo Foundation publishing the Recommendations for Implementation of the *BNCC Computação* as a means of facilitating its appropriation by teachers.

Seeking to bring the prerogatives of this document closer to the context of the classroom and thus favor their implementation, the Foundation criticizes the lack of promotion of digital literacy in Brazilian educational policies, but praises recent advances. The document states that the challenges for the 21st century require training for a job market dependent on mastery of Artificial Intelligence and digital systems. It mentions the constitution of a specific citizenship for a connected society, in which young people need to be prepared for an economy that is also described as digital.

The text starts from the perception that working on digital competences can be a challenge for teachers, seeking to bring the prerogatives of the *BNCC Computação* closer to the classroom context. It points to the need for a teaching profile that masters digital resources and states that it is necessary to ensure compliance with the guidelines, with monitoring of their implementation. She also points out that computing should be included in curricula across the board, however, she perceives "[...] the difficulty of ensuring that teachers comply with the inclusion of these skills in their teaching plans", which is why she recommends instituting a curricular component aimed at this, making it "[...] possible to guarantee more rigorous monitoring of the skills that are being

11 In the original text: "[...] avançar nas discussões acerca de temas como recursos educacionais digitais, plataformas adaptativas, práticas pedagógicas inovadoras e a importância de ressignificação dos processos de formação de professores para lidar com os desafios decorrentes da inserção da tecnologia e da IA como ferramenta pedagógica em sala de aula" (p. 28).

12 In the original text: "[...] necessidade de revisar e definir o papel e as competências necessárias dos professores, levando em conta que a interação humana e colaboração entre professores e alunos permanece como aspecto central da educação" (p. 28).

13 In the original text: "[...] estimular o desenvolvimento de habilidades interpessoais e emocionais, como criatividade e pensamento crítico (*soft skills*)" [...] "[...] avaliar a possibilidade de atualização da BNCC de modo que incorpore de maneira mais clara elementos relacionados ao pensamento computacional e à programação de computadores".

developed" (p. 18, own translation[14]). Thus, it ends up corroborating the premises of the OECD document, denoting the interrelationships between these actors and the socio-technical imaginaries they express in their discourses on digital transformation.

3.3 Discourses as beacons of social practices: convergences and divergences regarding a *teacher for the future*

Based on the concept of text as social practice proposed by Fairclough (2001), the documents presented in this summary are seen in their textual and discursive aspects as forms of action, representation and signification of the world, which express a dialectical movement with the social structure in which meanings, conventions, identities and power relations are (re)defined. As the four documents are official institutional productions, they use language that tries to express a certain *neutrality*, presenting, in a standardized and articulated way, a scenario that is treated as *obvious,* in which digital technologies play a leading role in education and teachers need to adapt to in order to help their students. The texts, in general, are structured without referencing recognized scholars in the field of education, but are based on the assumption that the job market will increasingly demand professionals who master digital resources and the school would be the place where this training should take place.

In their production and distribution processes, even though they come from different institutional spaces, the documents are aimed at policy makers (especially the first three) and also at those who actually implement them, such as the last material, which *translates* a policy into a language that it considers closer to that of teachers in order to make its proposals a reality. Converging on the digital future, they reaffirm how social practices, specifically those in the field of education, would be intrinsically associated with digitization, Artificial Intelligence and datification, with teachers needing to be prepared for this, which is associated with the development of digital competences.

In this sense, a first analytical category that brings the writings together is *technological solutionism* - also called *technosolutionism*, a theoretical construction by Morozov (2018). Digital resources are seen as inherent to pedagogical processes in order to qualify education and make it suitable for what is expected of the future, as if, through these resources, any problem or difficulty could be solved. Technological solutionism also reverberates the concern with training human resources (and their efficiency) for a labor market indicated as highly technological, with the school being the space for training its human capital, confirming the reproduction of contemporary capitalist ideology in education (Saura; Cancela; Parcerisa, 2023).

In relation to this first field of meaning, the documents reaffirm the need to *train teachers in digital skills* to keep up with these transformations, which are imminent and undeniable, making these requirements a condition for digitization to take place in schools. In order to guarantee this, strategies are proposed such as initial training aimed at the practical use of digital resources; coaching processes, in which practising teachers with better results help others; and constant teacher assessment, presented as a way of monitoring (and charging for) progress in obtaining and applying these skills in everyday school life. More than a training process, there is a renewed concern with teacher *training* aimed at handling basic tools, starting with the development of digital skills, digital literacy and

14 In the original: "[...] a dificuldade de garantir que os professores cumpram com a inclusão dessas habilidades em seus planos de ensino" (p. 18) [...] "[...] possível garantir um acompanhamento mais rigoroso sobre as habilidades que estão sendo desenvolvidas" (p. 18).

the inclusion of these resources among teaching materials. As much as this appears to be a necessity *for the future*, it needs to start in the present - a point that converges in the last three documents - so that the perception of EdTEch GoStudent is realized.

Among this actor's perspectives, the semantic field reveals a *distancing* of the teacher from activities that include learning and decisions about it, since, for the unicorn, AI will identify demands and *deficits* in the student's education and remedy them through objective and efficient language. Furthermore, the teacher is not mentioned as the one who has a set of specific knowledge and pedagogical skills to create learning situations. As represented in the speeches of the other actors, it is up to the teacher to master the digital tools, becoming a link between them and the students - a finding that also reverberated in the studies by Roberts-Mahoney, Means and Garrison (2016) and Knox, Williamson and Bayne (2019).

At the same time, professionals from different areas, who are not necessarily prepared to teach, are considered to help these students in their *experiences*, since they would have the specialized knowledge for an educational trajectory that is seen as individual. This was also highlighted in the studies by Roberts-Mahoney, Means and Garrison (2016), who, by identifying the education of the future as a personalized experience, mapped the inclusion of non-teachers. Personalization, in turn, is another of the characteristics that emerges from the documents analysed, and is fundamental to the socio-technical imaginary constituted in this scenario, as already diagnosed in the studies by Ideland (2021) and Roberts-Mahoney, Means and Garrison (2016), since technologies would allow students to dedicate themselves to subjects of their interest.

This shifts the role of the teacher from that of a holder of knowledge (such as the one who *explains* a subject) to that of a *coach* who *motivates* and cares about their well-being, which reaffirms the conformation of an *expendable teaching profession*, with learning being detached from explanation and teaching action and the teacher becoming, as GoStudent points out, a *coach*. Although the other documents do not address this point with such transparency, they reaffirm this element by emphasizing socio-emotional competences in their guidelines, making their development intertwined with that of digital competences. Ideland (2021) had already identified this trend in his research, in which, in addition to attending to the student in a flexible way, the teaching priority should be *soft* and *value skills,* rather than disciplinary knowledge or competences.

Providing programmatic socio-technical imaginaries (Saura; Cancela; Parcerisa, 2023) by informing and directing governments on the positions they should adopt in their policies, and the means for them to be effectively implemented, the documents also express a context in which it is not only the teacher who seems to be indicated as unnecessary, but the school itself. In the speeches, the personalization of learning is emphasized as a means for each student to carry out a specific training path, at different times and in different spaces from their peers and not necessarily linked to a class and a teacher. With a future qualified as uncertain and constantly changing, individualization and competitiveness, hallmarks of neoliberalism in its current form, appear to be aggravated, without a common training perspective.

The vision of a technological future to which schools and teachers must adapt, although better described in some documents than others, is shared in this framework of documents, ratifying the *technological solutionism* discussed by Morozov (2018) in the field of education. However, the OECD, EBIA and the proposal that represents Brazilian civil society organizations are still concerned with developing basic skills in teachers so

that they can act in a digital classroom in the future. Being more pragmatic and instrumental, these three documents are at odds with GoStudent's futuristic contextualization, which sees schools and teaching itself as already permeated by AI and as spaces in which, in the next 25 years, human-brain integration should materialize (GoStudent, n.p. b).

4. Conclusion

The perceptions of the documents analyzed, more than mere speeches, structure social practices, constituting identities, conventions and norms (Fairclough, 2001) for education, which become references to follow. By corroborating these socio-technical programmatic imaginaries developed by digital governance political networks (Saura; Cancela; Parcerisa, 2023), they also reaffirm their ideology, which reproduces macro-structured strategies, at a global or national level, that limit democracy itself, as educational contexts are disregarded, as well as their singularities and difficulties, in favour of conceptions constituted in digital privatization processes (Saura *et al.*, 2024a). In the case of Brazil, these movements are exacerbated by the country's socio-historical development based on inequalities that persist (and are not questioned by the references examined), with everyday school life being one of the spaces in which disparities become explicit.

Teaching, in an idealized future in the midst of digital privatization dynamics, is presented as separate from pedagogical decisions (to be made by algorithms), and restricted to motivating students' socio-emotional skills; at the same time, however, there are concerns about the development of basic digital skills by teachers today, especially in the Brazilian scenario. In a scenario idealized as highly digitalized, they express the controversies between the expectations of programmatic socio-technical imaginaries (Saura; Cancela; Parcerisa, 2023) regarding a technological solutionism (Morozov, 2018) and the socio-educational context of Brazilian schools, especially public schools.

Even though, with the Covid-19 pandemic, many resources have been incorporated into everyday life by teachers and students, concerns about teacher training gaps in digital skills are highlighted in Brazilian and international materials. In addition, although structural limitations are not discussed in depth in the publications (nor are they the focus of this study), difficulties in using digital resources may express their absence in institutions or limitations (including time and support) so that they can be understood in their pedagogical sense and considered for everyday planning. Also, the digital transformation of the teacher aimed at in the materials investigated shows how the processes of digital educational privatization consolidate the disregard of teachers in decision-making on the public agenda. From an instrumental point of view, these professionals are seen as reproducers of content and techniques, and should only be trained to handle resources, which corroborates the *moral* devaluation of the profession.

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