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THE DEVELOPMENT OF THE NETWORK AND THE CONCEPT OF BLENDED EDUCATION IN BRAZIL: POLICIES, TECHNOLOGIES AND CRITICAL PERSPECTIVES

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Abstract: This article analyzes the development of blended education (HE, as it is called) in Brazil, with a focus on public policies, technologies, and the role of artificial intelligence (AI). Through documentary analysis, the research investigates the concept of HE, its regulatory framework, the Innovation Network for Blended Education (RIEH), and pedagogical challenges. The results highlight the polysemy of the term and the technological and pedagogical challenges, including the role of Artificial Inteligence.

Keywords: Blended Education; Educational Policies; Artificial Intelligence in Education.

O DESENVOLVIMENTO DA REDE E DO CONCEITO DE EDUCAÇÃO HÍBRIDA NO BRASIL: POLÍTICAS, TECNOLOGIAS E PERSPECTIVAS CRÍTICAS

Resumo: Este artigo analisa o desenvolvimento da Educação Híbrida (EH) no Brasil, com foco em políticas públicas, tecnologias e o papel da Inteligência Artificial (IA). A pesquisa, realizada por meio de análise documental, investiga o conceito de EH, seu marco regulatório, a Rede de Inovação para a Educação Híbrida (RIEH) e os desafios pedagógicos. Os resultados apontam a polissemia do termo e os desafios tecnológicos e pedagógicos, incluindo a perspectiva da Inteligência Artificial.

Palavras-chave: Educação Híbrida; Políticas Educacionais; Inteligência Artificial na Educação.

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EL DESARROLLO DE LA RED Y DEL CONCEPTO DE EDUCACIÓN HÍBRIDA EN BRASIL: POLÍTICAS, TECNOLOGÍAS Y PERSPECTIVAS CRÍTICAS

Resumen: Este artículo analiza el desarrollo de la Educación Híbrida (EH) en Brasil, centrándose en las políticas públicas, las tecnologías y el papel de la Inteligencia Artificial (IA). La investigación, basada en un análisis documental, examina el concepto de EH, su marco regulatorio, la Red de Innovación para la Educación Híbrida (RIEH) y los desafíos pedagógicos. Los resultados ponen de manifiesto la polisemia del término y los desafíos tecnológicos y pedagógicos, entre los que se incluye la perspectiva de la Inteligencia Artificial.

Palabras clave: Educación Híbrida; Políticas Educativas; Inteligencia Artificial en la Educación.

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1 INTRODUCTION

Blended Education (HE, short term used in Brazil) has emerged as a prominent movement in the Brazilian educational landscape, significantly accelerated by social distancing measures imposed during the Coronavirus (Covid-19) pandemic. However, its roots lie in previous discussions about integrating Digital Information and Communication Technologies (DICTs) into teaching and learning processes (Nunes; Malagri, 2024). In this context, an in-depth analysis of the development of the HE network and concept in Brazil is not only relevant but also crucial. The choice of terminology around "blended" — whether "blended teaching," "blended learning," or "hybrid education" — transcends semantics. It implies distinct pedagogical, philosophical, and educational policy approaches that shape technological integration and the conception of education itself (Lima, 2024).

This discussion is particularly pertinent given the "terminological confusion" permeating the field, which obscures fundamental distinctions and impacts the formulation of cohesive public policies and meaningful pedagogical practices. Official documents such as the e-book "Educação Híbrida: Conceito e Orientações Pedagógicas" (Blended Education: Concept and Pedagogical Orientations) (Brasil, 2025b) and "Educação Híbrida em Contexto com a RIEH" (Blended Education in Context with the RIEH) (Lima, 2024) aim to provide guidelines and clarity. However, the topic's inherent complexity and various perspectives, including criticisms of a potential "Distance Education" (EaD, short-term used in Brazil) methodology with a mercantilist bias (Lima; Rodrigues; Cruz, 2021), necessitate investigative and critical analysis.

This article aims to analyze the development of the Blended Education network and its concept in Brazil thus far. Specifically, the article seeks to: (i) map and discuss the different conceptualizations of blended education present in official documents from the Ministry of Education (MEC) and the Innovation Network for Blended Education (RIEH), as well as in academic literature; (ii) analyze the political and regulatory framework supporting blended education in Brazil, including recent legislation such as Law No. 14,945/2024 and Ordinance No. 865/2022, which established the RIEH; (iii) describe the RIEH's structure, objectives, and resources as presented in federal government documents; and (iv) discuss the pedagogical and technological implications of blended education in the context of Artificial Intelligence.

This study is justified by the urgent need for an in-depth, critical understanding of blended

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education that goes beyond simply adopting technology and questions its foundations, potentialities, and risks for Brazilian education. The adopted methodology, based on Minayo's (2001) survey, consists of a documentary analysis of reference e-books and public documents. A search was also conducted on the Capes Journals Portal, limited to the period from 2019 to 2025. This search yielded 62 articles, 51 of which were open access. After analyzing their adherence to the concept of hybrid education, six articles were selected for the analysis. The study is complemented by other relevant sources on educational policies, technologies, and their intersection with Artificial Intelligence. The article is structured into sections that address the conceptual development of the "blended," the political-regulatory framework, the RIEH, pedagogical dimensions, challenges, and future perspectives, including the integration of Artificial Intelligence (AI). It is expected to contribute to an informed debate on the future of Blended Education in the country.

2.1 The Polysemy of the "Blended": Uncovering Concepts in Brazilian Education

The discussion on integrating technologies and different modalities into the Brazilian educational process is marked by notable terminological polysemy, particularly concerning the concept of "blended" (Lima; Rodrigues; Cruz, 2021). While this diversity reflects a field in effervescence and maturation, it can also generate ambiguities that hinder the formulation of public policies and the consolidation of innovative pedagogical practices. The survey revealed that distinguishing the differences between terms such as "Blended Teaching," "Blended Learning," and "Blended Education" is essential for a thorough analysis of the topic.

Historically, the notion of "blended teaching" has referred to an instrumental perspective described as a combination of presential and non-presential moments. This concept has sometimes been associated with traditional practices, such as "homework," but has been enhanced by the advent of Information and Communication Technologies (ICTs) (Brasil, 2021). In contrast, more recent documents from the Ministry of Education (MEC) and the Innovation Network for Blended Education (RIEH) have sought to refine this understanding. The Ministry of Education Manual defines blended education as

> [...] the combination and/or integration of pedagogical activities through presential education in physical school spaces and non-presential education mediated by teaching planning and action with the support of digital information and

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> communication technologies and online environments, which aim at innovation and expansion of times and spaces in the educational process (Brasil, 2025b, p. 8, our translation).

This definition emphasizes pedagogical intentionality and the teacher's central role, shifting away from merely juxtaposing modalities. In the same guiding document, the RIEH itself proposes an internal differentiation of the concept of blended education. In its Lato Sensu, blended education is viewed as an expanded concept that does not separate the ideas of EH, digital culture, and teaching and learning. This perspective recognizes the diversity of teaching and learning methods, some of which may involve digital technologies, and it values dialogue and respectful teacher mediation. Stricto sensu, blended education is conceptualized as an "ecosystem that prioritizes the careful combination of in-person pedagogical activities within and outside the educational institution, mediated by teaching action planning and the use of DICTs" (Brasil, 2025b, p. 40, our translation). This approach focuses on expanding time and space, as well as student protagonism. It is also important to distinguish blended education from "technology-mediated education," which, according to CNE/CEB Resolution No. 2/2024, refers to a pedagogical practice involving live classes transmitted from one location to other rooms with mediating teachers present at both locations. This practice is not to be confused with Distance Education (Brazil, 2025b).

Based on our analysis of the "Blended Education" survey conducted on the Capes Periodicals portal and government websites, we have formulated the following definitions:

Chart 1 - "Blended" Typologies

Term	Main Source/Origin	Synthetic Definition	Main Emphasis	Keywords
Blended Learning	MEC (Blended Education Framework, 2021)	Flexible, active, innovative pedagogical methodology, mediated by DICTs, integrating presential and non-presential moments for autonomy and protagonism.	Pedagogical (student process)	Flexibility, autonomy, protagonism, DICTs, BNCC

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Hybrid Education	Lima; Rodrigues; Deus (2025).	Integration of pedagogical activities mediated by teaching action, expanding times/spaces, with digital/analog, in-person/virtual technologies.	Pedagogical (system, integration, teaching action)	Integration, teaching mediation, expansion of times/spaces, technologies, digital culture
Blended Teaching	MEC (Blended Education Framework, 2021)	Combination of presential teaching with remote activities.	Methodological (content delivery)	Combination, in-person classes, remote.
Semipresencial[1] Education	Legislation; Lima *et al.* (2021)	Modality that combines presential workload with distance activities, often regulated by specific percentages.	Regulatory, Modality	Distance education workload, EaD in presential courses.
OnLIFE Education	Schuster *et al.* (2024)	Approach that transcends the online/offline dichotomy, fluidly integrating learning experiences into a hyperconnected reality.	Integrative, Philosophical	Hyperconnectivity, fluidity, digital-physical integration, pedagogical reconfiguration

Source: Created by the authors (2025).

In this conceptual scenario, we emphasize the importance of clarity. We argue that terminological confusion and the absence of solid state definitions, particularly for semipresencial education, can undermine EaD and blended offerings. This paves the way for technologies to prioritize market interests at the expense of socially oriented perspectives on human development (Lima; Rodrigues; Cruz, 2021).

The authors' proposed immersion in Blended Education also presupposes an understanding of digital culture, which Gere (2008) and Santaella (2003) define as the influence of digital technologies on cultural practices, communication, and knowledge production. The involved technologies are diverse and range from analog to the most sophisticated digital information and communication technologies (DICTs), digital information, communication, and expression technologies (TICEs,

[1] Semipresencial, in Portuguese, refers to classes with elements of presential and distance education.

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short-term used in Brazil), and, more recently, artificial intelligence technology in education (TIAED, short-term used in Brazil and here after) (Brasil, 2025a, p. 12–13). The latter field is the central focus of one of the authors' ongoing doctoral research and presents a new horizon of possibilities and complexities for blended education. It demands investigations into how AI can be integrated in an ethical and pedagogically relevant way to enhance teaching and learning processes in this blended context.

2.2 Political-Regulatory Framework for Blended Education in Brazil

The survey found that the institutionalization and promotion of Blended Education (HE) in Brazil has been outlined progressively by a set of regulatory documents and government policies issued mainly by the Ministry of Education (MEC) and the National Education Council (CNE). This legal and guiding framework not only directs the implementation of HE models but also responds to contemporary demands for innovation and flexibility in education. These demands have been intensified by contexts such as the Covid-19 pandemic and the need to reorganize learning.

The chart below summarizes the important documents for understanding the political-regulatory framework.

Chart 2 - Guidelines and Objectives for Blended Education.

Document/Normative Act	Year	Issuing Body	Level of Education	Main Guidelines/Objectives for Hybrid Education
Reference Text Blended Education (Hybrid Learning)	2021	MEC	General (Basic and Higher Education)	Defines Hydrid Learning; guidelines for flexibility, autonomy, ICTs, teacher training, BNCC.
Reference Text Blended Education in Basic Education	2022	MEC	Basic Education	Guidelines for the hybrid process in Basic Education; articulation with BNCC; use of up to 20% of non-classroom load in Elementary Education; assessment; frequency.

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CNE/CP No. 14/2022	2022	CNE/CP	Higher Education	Guidelines for the hybrid process in Higher Education; definition; association with active pedagogies; distinction from distance learning; incorporation into PPI/PPC; frequency; evaluation.
Decree No. 11,079/2022	2022	President of the Republic	Basic Education	Establishes the National Policy for Learning Recovery; provides for the Ecosystem of Innovation and Digital Educational Solutions and the Innovation Network for Blended Education (RIEH).

Source: Created by the authors (2025).

One of the recent pillars is Law No. 14,945, of July 31, 2024, which introduced significant changes to High School education and addressed society's demand for new pedagogical approaches (Brasil, 2024a). Additionally, Law No. 14,533/2023 institutes the National Digital Education Policy and amends the Law of Lines of Direction and Bases of the Education (LDB — Law No. 9,394/1996). This amendment emphasizes digital education, guaranteed connectivity, and the development of digital literacy, content creation, communication, and collaboration skills. These elements are intrinsically linked to the possibilities of EH (Brasil, 2023).

CNE/CEB Resolution No. 2, issued on November 13, 2024, establishes the National Curricular Guidelines for High School (DCNEMs, short-term used in Brazil and hereafter) and is particularly relevant to the conceptualization of "technology-mediated education" and "Blended Education" (Brasil, 2024b).

Within the scope of development policies, Decree No. 12,391 of February 28, 2025, which established the National Pact for the Recomposition of Learning, states in Article 21 that "the implementation of educational offerings for the teaching and learning process will be supported by the Innovation Network for Blended Education" (Brasil, 2025a, art. 21, our translation). The Innovation Network for Blended Education (RIEH) was formally established by the Ministry of Education (MEC) Ordinance No. 865 on November 8, 2022. The RIEH aims to "promote the implementation of blended education strategies in all federative entities of the country" (Brasil, 2025a, p. 5, our translation) and contribute to the equitable and effective implementation of the New High School. The RIEH was also mentioned in Decree No. 11,079/2022 (revoked by Decree No.

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12,391/2025), which dealt with the National Policy for Learning Recovery in Basic Education (Brasil, 2022a).

For Higher Education, CNE/CP No. 14/2022 establishes general national guidelines for developing the hybrid teaching and learning process. It defines this process as a "flexible methodological approach organized using information and communication technologies (ICTs) that is active and innovative" (Brasil, 2022b, p. 12, our translation). This process is associated with active pedagogical principles and is distinct from traditional Distance Education (EaD).

However, this regulatory framework has been subject to critical analysis. Lima, Rodrigues and Cruz (2021) point out that there is concern that blended education, in some of its formats and discourses, may serve as a strategy to "methodologize" distance education. The authors argue that this approach aims to deregulate distance education by allowing technology-mediated education to be used more flexibly, often serving the interests of capital and the expansion of private higher education institutions without adequate quality assessment and monitoring. MEC Ordinance No. 2,117/2019, which increased the limit on distance education workload in undergraduate regular courses, is frequently cited in the context of flexibility (Lima; Rodrigues; Cruz, 2021).

This duality — between a pedagogical discourse that extols innovation and autonomy, and mechanisms that can facilitate precariousness — underscores the complexity of the field and the necessity of critically monitoring policies and their implementation. Therefore, the State's role becomes central not only in fostering innovation but also in carefully regulating, continuously assessing, and guaranteeing the quality and equity of Blended Education provision. This ensures that educational policies benefit the comprehensive education of students and the valorization of public education (Brasil, 2025a).

2.3 The Innovation Network for Blended Education (RIEH): Strategies and Resources

Central to the federal government's strategy to promote and disseminate Blended Education in Brazil, especially in the public education system, is the Innovation Network for Blended Education (RIEH). Formally established by MEC Ordinance No. 865/2022, RIEH is the result of a partnership between the Ministry of Education (MEC) and the Center for Excellence in Social Technologies (NEES) of the Federal University of Alagoas (UFAL). Its primary objectives include ensuring technical and technological infrastructure support for the equitable development of Blended

Education, improving the quality of educational offerings, and promoting the sharing of productions and access to content among the federative entities that adhere to the initiative (Brasil, 2025a). RIEH thus aims to build an ecosystem of innovation and digital educational solutions, as also signaled by Decree No. 11,079/2022. and its successor, Decree No. 12,391/2025.

The operationalization of RIEH is anchored in key components, designed to offer multifaceted support to education networks (Lima, 2024). Among them, the following stand out:

- **Innovation Centers:** These spaces are designed for pedagogical and creative activities that engage the school community and promote inclusion (Brasil, 2025a). They are equipped with technology for producing and transmitting audiovisual content. This technology includes robotic cameras controlled by joystick, chroma key (green/blue screen for visual effects), computers dedicated to managing material and displaying it on screens, a 60-inch touchscreen television for teachers to interact with digital materials (slides, notes), a computer for recording with OBS software for mixing and transmitting images, and a 32-inch LED television for providing video feedback or serving as a teleprompter (Lima, 2024). These centers serve as laboratories for producing Digital Educational Resources (DERs) and experimenting with new pedagogical practices.
- **RIEH Virtual Environment (AVA):** This is a platform designed for synchronous and asynchronous educational activities. The system is designed to be integrated at a national level, enabling public schools to access subjects and curricular units offered by partner institutions of the Network (Lima, 2024; Brasil, 2025a). The AVA aims to expand access to technology and multiply the possibilities for choosing content.
- **RIEH Repository:** Accessible on its official *website* through the path "Platforms" and then "Repository", it is the fundamental component for sharing content and Digital Educational Resources (DERs). It allows materials produced by the Education Departments (videos, animations, images, audios, texts, *podcasts*, lesson plans) to be made available in different formats. All DERs have an open license for use and adaptation (non-commercial), and the repository also encourages the sharing of lesson plans and user experiences through reports, promoting "social curation" and meeting the requirements of the General Data Protection Law (LGPD) (Lima, 2024; Brasil, 2025a).
- **National Blended Education Observatory:** Coordinated by the MEC in partnership with

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UFAL, this observatory aims to promote the implementation, integration and monitoring of activities developed by RIEH (Lima, 2024).

The concept of Innovation adopted by RIEH transcends the mere application of new technologies. According to Lima (2024, p. 15, our translation), innovation at RIEH involves "developing actions, projects, programs, and activities in educational practices differently from previous developments", aiming to "add new value and contribute to social, collective, political, and empowering learning for students in an educational context" (Brasil, 2025b, p. 21–22, our translation). Although digital technologies are predominant in this process, innovation can occur with or without them (Lima, 2024).

In this context of fostering innovation and making advanced technological resources available, such as those in the Innovation Centers, the groundwork is laid for investigating the integration of Artificial Intelligence. The question is how AI engines and TIAED tools could be incorporated into RIEH proposals, whether in creating more adaptive and interactive DERs in the repository or supporting content production in the centers. RIEH's proposed infrastructure and network can serve as a national laboratory for developing and critically evaluating AI applications in blended education, in line with the principles of equity and pedagogical quality.

2.4 Pedagogical Guidelines and Implications of Blended Education

The effectiveness of Blended Education (HE) transcends the simple incorporation of technological devices, residing fundamentally in its pedagogical conception and implementation. Guiding documents of RIEH and the results of the survey converge in stating that HE is, in its essence, "more pedagogical than technological" (Brasil, 2025b, p. 8, our translation). This implies an intrinsic valorization of teaching work, educational intentions and interactions that promote meaningful learning (Brasil, 2025b).

One of the pillars of this approach is the centrality of teacher mediation and the active participation of those involved. Overcoming the traditional view of teachers as mere transmitters of knowledge, the EH approach proposes teachers as mediators and organizers of the educational process, as Lima (2024) points out. For example, Toschi (2021) suggests replacing the traditional pedagogical triangle with the "pedagogical spiral." In this spiral, the teacher, student, and knowledge

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dynamically interconnect with media (digital or not) and networks in an ongoing process without predefined limits (Brasil, 2025b). This dynamic involves two types of mediation: Didactic mediation, led by the teacher, who creates conditions and means for students to relate to knowledge; and cognitive mediation, the students' effort to understand content, activated by desire to learn and proposed strategies (Brasil, 2025b). Therefore, the protagonism is shared: the teacher is the planner and mediator, and the student is the agent of his or her learning.

Several methodologies and pedagogical approaches are advocated to foster this dynamic. One of the most notable is the Pedagogy of Question or Challenge, inspired by Paulo Freire, Antonio Faundez (2013), and Bernard Charlot (2005) and promoted by Toschi in Brasil's work (2025a). This approach is based on the principle that genuine, challenging questions spark curiosity, critical reflection, and knowledge construction. It allows students to express their understanding and doubts through respectful, uncensored dialogue (Brasil, 2025b). Similarly, the participatory methodology, as systematized by Araújo (2017), emphasizes participation, sharing, collaboration, and cooperation. It begins and ends with social practice, assigning the teacher a crucial role as organizer and mediator (Lima, 2024).

The implementation of these approaches requires flexible and intentional planning. As Lima (2024) and the RIEH guidelines (Brasil, 2025b) propose, effective planning requires considering various elements, including learning objectives, pedagogical design, technologies to be used, time organization (synchronous and asynchronous), space organization (in-person, virtual, and other environments), activity development and settings, and continuous monitoring and evaluation (Lima, 2024; Brasil, 2025b). Essential principles include clarity of objectives, connection between in-person and remote activities, balance between individual and collaborative work, appropriate adaptation to tools, and focus on engagement. Furthermore, aspects such as inclusion and attention to students' affective, social, and emotional dimensions must permeate the entire process (Lima, 2024).

This vision culminates in the conception of a Blended Education Ecosystem, as proposed by RIEH and Lima (2024). This ecosystem

> [...] prioritizes the careful combination and integration of content and pedagogical activities in person at the educational institution and may be combined with activities outside of it, including the use of the Innovation Center, the Virtual Learning Environment, and materials from the Digital Repository in a relational and continuous way. These activities are mediated and organized by teaching action planning and the connection between the use of digital technologies and the practice of digital culture. The goal is to expand the times and spaces of the educational process while respecting student protagonism and their time and space,

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> whether individually or collectively (Lima, 2024, p. 19-20; Brasil, 2025b, p. 26, our translation).

The pedagogical guidelines, therefore, point to a Blended Education that moves away from transmissive and technical models, seeking to build richer, more participatory, flexible learning experiences that are connected with the demands of digital culture and the needs of teachers and students.

2.5 Challenges, Impacts of Artificial Intelligence and Future Perspectives

Despite the innovative potential and policy guidelines driving Blended Education (HE) in Brazil, effectively and equitably implementing it faces critical challenges. The transition to hybrid models occurs within an educational landscape marked by profound inequalities and structural deficiencies. Depending on how they are implemented, new approaches can either mitigate or exacerbate these issues.

Data from Cetic.br's 2023 TIC Educação survey indicates the necessity of public policies that extend beyond merely ensuring school connectivity. The study indicates that digital exclusion and poor infrastructure are clear obstacles that exacerbate educational disparities since unequal access to devices and quality internet hinders students' participation (Cetic.br, 2023). Therefore, it is crucial to invest in improving connectivity, purchasing equipment, maintaining it, and training teachers to promote the meaningful and transformative use of technology in teaching and learning.

Additionally, teacher training has emerged as a persistent bottleneck. There is still an insufficient amount of adequate training for the pedagogical use of digital technologies and the development of blended methodologies that promote engagement and participatory learning. Simply transposing in-person practices to the digital environment limits the transformative potential of HE, requiring robust, ongoing training to prepare educators to act as mediators and "experience designers" of teaching and learning processes in this new context (Brasil, 2025b).

Beyond the availability of materials, the perception of technology's role in education often neglects its deeper dimensions. Digital technologies, and more recently, Artificial Intelligence, are often viewed primarily as instrumental tools to optimize teaching and education or innovate pedagogical practices. This limited perspective hinders the critical understanding of the complex sociotechnical systems involved and the interests shaping them. It obscures the power relations and

dependencies that may arise from adopting certain infrastructures and platforms, especially when they are controlled by a few global actors. In the educational context, "there is little epistemological discussion of technology, as well as its functional and operational requirements, and even less of its mechanisms of geopolitical, economic and ideological power" (Barbosa; Gonsales, 2024, p. 3, our translation).

The issues of quality and commodification also permeate the debate. If not accompanied by robust regulatory and evaluation mechanisms focused on pedagogical quality, the flexibility provided by HE — sometimes confused with distance education or technology-mediated education — can lead to a streamlining of training and favor market interests at the expense of comprehensive human development, as warned by Lima, Rodrigues and Cruz (2021). Additionally, including students with specific educational needs presents particular challenges. This requires accessible digital resources, specific training for educators and interpreters, and methodologies that consider their unique needs. This would overcome the difficulties observed in the education of deaf people during social distancing due to the Covid-19 pandemic, for example.

Adding a new layer of complexity and potential to this scenario is artificial intelligence (AI). The interface between AI and blended education is a promising field of study for one of the authors of this article, but it demands critical analysis. AI technology in education can offer opportunities to individualize learning paths, provide adaptive feedback, automate administrative tasks, and create innovative support tools for students and teachers (Brasil, 2025b; Lima, 2024). However, integrating AI raises crucial ethical and pedagogical questions: How can we ensure equitable access to and use of these tools? How can we mitigate algorithmic biases that perpetuate inequalities? What impact will it have on teacher autonomy and human interaction? How can we ensure the privacy and security of student data? Therefore, the development of specific public policies and ethical guidelines for the use of AI in education is an urgent necessity so that its potential can be harnessed responsibly and beneficially in the context of Blended Education.

Despite the challenges, blended education remains an approach with the potential to make education more flexible, engaging, and aligned with 21st-century culture. However, consolidating it as a strategy to improve quality and equity requires overcoming structural obstacles and adopting genuinely innovative pedagogical models. As UNESCO (2023) points out, international experience reinforces the need for public policies that guarantee infrastructure, ongoing teacher training, adapted curricula, and sustainable financing. Technology should be a tool for learning and inclusion, not an

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end in itself. In the Latin American context, HE is seen as an opportunity to expand access; however, it requires greater investment in research and professional development for teachers. Brazil's path forward appears to necessitate collaboration among administrators, educators, and researchers, coupled with ongoing, rigorous monitoring of policies and practices. This will ensure that HE, whether enhanced by AI or not, contributes effectively to a more equitable and transformative educational landscape.

3 CONSIDERATIONS

Throughout this article, we critically analyzed the development of the Blended Education (HE) network and the evolution of its concept in Brazil. This path has been marked by advances, tensions, and persistent challenges. Our investigation revealed a significant amount of ambiguity surrounding the term "blended," with different conceptualizations, such as "blendd teaching," "blended learning," "blended education" (in its broad and strict meanings), and "technology-mediated education" (Brasil, 2025b; Lima, 2024). These different conceptualizations coexist and sometimes generate ambiguities that impact everything from the formulation of public policies to the implementation of pedagogical practices. The importance of conceptual clarity that transcends mere technological incorporation and focuses on pedagogical intentionality was highlighted, as advocated in the documents of the Innovation Network for Blended Education (RIEH) (Brasil, 2025b; Lima, 2024) and by researchers in the field (Lima; Rodrigues; Cruz, 2021).

Although the political-regulatory framework for distance education in Brazil demonstrates an effort to institutionalize and promote it, especially through the establishment of the RIEH (Brasil, 2022c) and the enactment of recent laws and guidelines (Brasil, 2024a; Brasil, 2023), it also sparks critical debates. The analysis revealed valid concerns about the methodology of distance education (EaD) and the risks of expansion driven by market interests at the expense of quality and equity (Lima; Rodrigues; Cruz, 2021). In this context, the RIEH emerges as a strategic government initiative with the potential to provide technical support, infrastructure, and a resource and training ecosystem (Brasil, 2025b). However, its success depends on its reach and the capacity of educational networks to critically adopt its proposals.

From a pedagogical point of view, the idea that blended education (HE) should be "more pedagogical than technological" was reiterated (Brasil, 2025b, p. 8, our translation). Approaches such

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as question/challenge pedagogy (Brasil, 2025), qualified teacher mediation, and participatory methodologies (Araújo, 2017; Lima, 2024) are essential for blended education (HE) to promote engagement, autonomy, and meaningful learning. The conception of a "Blended Education Ecosystem," which integrates various times, spaces, resources, and intentions, points to a promising path (Lima, 2024; Brasil, 2025b). Nevertheless, this path requires flexible planning and a focus on students' needs.

However, realizing this potential is hindered by significant structural challenges, such as digital exclusion; the precariousness of technological infrastructure in many schools; the urgent need for ongoing teacher training specific to the hybrid context (Brasil, 2025b); and the risk of exacerbating inequalities if inclusion is not a central pillar. The emergence of Artificial Intelligence (AI) adds a new dimension to this scenario by offering opportunities for personalization and innovation, as well as ethical and pedagogical challenges that urgently need to be debated and regulated. Ongoing doctoral research seeks to further explore this intersection by investigating how AI, including TIAED (Brasil, 2025a), can be integrated into HE to enhance learning without exacerbating inequalities or compromising the autonomy and critical role of educators and students.

In short, the development of blended education in Brazil is a complex and controversial process. For it to result in genuinely transformative and equitable advances, there must be a collective commitment to overcoming the identified challenges. This requires consistent public policies with adequate funding, robust investment in infrastructure and universal connectivity, and teacher training programs that prepare educators to critically mediate technologies (transcending the context of digital citizenship). Additionally, it requires the promotion of research and the development of contextually relevant and inclusive hybrid pedagogical models. Maintaining critical vigilance regarding the direction of HE, especially concerning the influence of AI, and engaging multiple stakeholders—including managers, educators, researchers, students, and civil society—are essential for realizing the promise of innovation in quality education for all Brazilians. Future research could focus on the long-term impact of RIEH policies, comparative studies of different EH models implemented in Brazil, and the development of ethical and pedagogical guidelines for applying Artificial Intelligence in blended education contexts.

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