

ISSN 2764-9733 | DOI 10.5281/zenodo.23062426

iJEResearch

INTERNATIONAL JOURNAL OF EDUCATION AND RESEARCH

Volume 1 | Number 2 | Year 2026

iJEResearch
international journal of
education and research

iJEResearch
Journal of Scientific Articles

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Frequency

Semester

Language

The Journal publishes articles in English only

Editor

Journal edited by the iiEP - Instituto Internacional de Educação e Pesquisa

Thirst: Av. Pastor Martin Luther King Júnior, 126 (Torre 2000 Sala 104) - Del Castilho

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iJERResearch

International Journal of Education and Research

Vol. 1, Number 2, September - 2026 | Peer-Reviewed Journal

ISSN 2764-9733 | ijerresearch.org

DOI: 10.5281/zenodo.23061780

SOCIAL MOVEMENTS AND EDUCATION: CONTRIBUTIONS TO CITIZENSHIP FORMATION AND SOCIAL TRANSFORMATION

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ABSTRACT

This article analyzes the pedagogical dimension of social movements and their strategic relevance to building critical and emancipatory citizenship in Brazil. This qualitative, bibliographic study was based on the theoretical contributions of Maria da Glória Gohn, Paulo Freire, Miguel Arroyo, and Boaventura de Sousa Santos and supplemented by recent studies published between 2022 and 2025. The objective was to investigate how non-formal educational practices developed within collective struggles for rights challenge abyssal thinking and foster an ecology of knowledges. The results indicate that movements such as the Landless Rural Workers' Movement (MST) and the Homeless Workers' Movement (MTST) function as educational territories that validate life trajectories and experiential knowledge frequently rendered invisible by traditional education. These spaces go beyond political demands and become environments of epistemological innovation in which critical consciousness is produced through transformative praxis. The study concludes that connecting systematized school knowledge with the ethics of social resistance is essential to a pedagogy capable of responding to contemporary challenges, promoting cognitive justice, and strengthening democratic life.

Keywords: Social movements. Non-formal education. Ecology of knowledges. Citizenship education. Critical consciousness.

INTRODUCTION

Understanding contemporary education requires moving beyond the traditional view that confines teaching and learning within school walls. In Brazil, a country marked by persistent social, racial, territorial, and economic inequalities, social movements emerge not only as political actors but also as important educational agents. Within these movements, knowledge, identities, and participatory practices are collectively constructed, forming a pedagogy of resistance. Recent studies reinforce the view that non-formal education expands opportunities for social development by connecting learning with lived experience, dialogue, and participation (Pinheiro, 2023; Souza, Rocha, and Santos, 2024).

This broader understanding of education is grounded in the premise that education is essentially a transformative praxis (Freire, 1987). From this perspective, social movements are no longer viewed solely as channels for making demands; they are also recognized for their foundational pedagogical dimension. According to Gohn (2012), collective action has a multiplier effect within civil society by creating forms of citizenship that participants learn and disseminate throughout the social body. Contemporary research on Freirean popular education also shows that dialogue, critical problem-posing, and organized participation remain central to emancipatory practices developed with historically marginalized groups (Paulo, Carrillo, and Faria, 2025).

The legitimacy of these educational processes, however, faces the challenge of epistemological marginalization. Knowledge produced through working the land, urban occupations, community organizing, and cultural collectives is frequently discredited by a modern, Eurocentric scientific logic. In opposition to this "abyssal thinking," Boaventura de Sousa Santos (2007) proposes an ecology of knowledges in which scientific knowledge does not erase other forms of knowing but instead engages in dialogue with knowledge arising from the experiences of subordinated groups. A recent mapping of educational scholarship on the ecology of knowledges confirms its relevance to critical intercultural education and to making visible forms of knowledge historically neutralized by dominant institutions (Nascimento and Candau, 2024).

The pursuit of cognitive justice is complemented by Miguel Arroyo's argument that education must recognize people through their concrete life trajectories (Arroyo, 2012). Learners are not passive recipients. They possess a formative heritage built within the family, the workplace, their territory, their culture, and community life—knowledge that schools often silence through purported neutrality or standardization. The limited number of studies explicitly connecting childhood, popular education, and social movements also reveals that educational research has not sufficiently examined many collective formative experiences (Soares, 2022).

In this context, this study analyzes social movements as educational spaces for developing critical consciousness and social participation. It seeks to understand how practices developed in these settings contribute to human emancipation and the democratization of educational processes beyond school by validating other subjects and other pedagogies. Recent studies of rural movements and an MTST literacy initiative demonstrate that collective struggle can simultaneously produce political consciousness, educational practices, and access to rights (Guerreiro, Silva, and Carvalho, 2023; Alcântara and Brutscher, 2024).

METHODOLOGY

This study adopted a qualitative, bibliographic approach based on the critical analysis of scholarship at the intersection of Sociology and Education. This methodological choice made it possible to interpret the relationships among citizenship education, collective action, and learning in settings outside school without reducing social movements to isolated institutional experiences.

The analytical framework was based primarily on Maria da Glória Gohn's (2012) formulation of non-formal education, placed in dialogue with the ethical and political perspectives of Paulo Freire (1987), Boaventura de Sousa Santos (2007), and Miguel Arroyo (2012). The contributions of Dermeval Saviani (2016) and José Carlos Libâneo (1994) were also used to situate the functions and limitations of schooling in relation to education understood as a broader social practice. To update and diversify the discussion, ten studies published between 2022 and 2025 were incorporated, addressing popular education, rural and urban social movements, the ecology of knowledges, non-formal education, and cultural practices in marginalized urban communities.

The procedure consisted of locating, reading, and interpreting peer-reviewed books and scientific articles that connected the categories of social movements, citizenship, popular education, non-formal education, critical consciousness, and epistemological plurality. Priority was given to recent studies clearly related to the Brazilian context, while classic works were retained because they provide the conceptual foundation for the debate. The material was examined through hermeneutic and critical reading to identify convergences, tensions, and empirical illustrations of the formative role of collective action. This theoretical cross-analysis made it possible to discuss how these educational spaces promote emancipation and social transformation without treating education as a merely instrumental activity.

PRESENTATION AND DISCUSSION OF RESULTS

The pedagogy of resistance in motion

The intersection of social movements and education reveals that non-formal learning is not merely an appendage to schooling but a field in which autonomous knowledge is produced. When Arroyo's argument is considered alongside contemporary Brazilian experiences, it becomes clear that historically marginalized collective subjects do not enter struggles as "blank slates." They bring pedagogies of survival, work, culture, and solidarity that challenge rigid curricula and disrupt what the author calls the "large estate of knowledge." Research on childhood and popular education, as well as on collective resistance in rural areas, confirms the formative depth of these experiences and the need to increase their visibility in educational scholarship (Soares, 2022; Guerreiro, Silva, and Carvalho, 2023).

Education beyond school walls: the role of social movements

Reducing education to the physical boundaries of the classroom means disregarding the formative processes that shape people within their social realities. Challenging this restricted understanding, Arroyo (2012) describes learners as historically complex subjects whose life trajectories and resistance constitute a formative heritage that schools frequently render invisible. In the author's words:

School pedagogies have also advanced by recognizing that when Other Subjects—other children, adolescents, young people, and adults—arrive at schools and universities, they bring other forms of knowledge and other experiences of the world, and therefore other readings of the world, the city, and the countryside (Arroyo, 2012, p. 34).

For Arroyo (2012), schools must recognize that social movements produce knowledge capable of disrupting established hierarchies. Learning is not the exclusive privilege of academia or traditional curricula. Struggles for housing, land, work, and survival constitute powerful pedagogical settings. Experiences developed in teacher education and at an MTST popular school show how contact with collective organizations can give new meaning to professional preparation and connect literacy,

political participation, and dignity (Torres, 2024; Alcântara and Brutscher, 2024).

By challenging the "large estate of knowledge," social movements become territories in which citizenship education takes concrete form through social practices and active participation. Recognizing other actors and territories in the production of knowledge is therefore necessary to destabilize the mistaken idea that schools hold a monopoly on education.

Cultural movements in marginalized urban communities, including hip-hop collectives, funk networks, poetry gatherings, and community meetings, also serve as educational agents that validate historically marginalized knowledge. By addressing race, class, territory, and belonging, these groups transform life in marginalized communities into a formative heritage and challenge formal education to recognize other pedagogies of life. Recent studies on hip-hop pedagogy and urban art show that rap, freestyle battles, funk, and other cultural practices from marginalized communities can bring school learning closer to youth cultures, antiracist education, political development, and creative participation (Tejera and Siqueira Junior, 2025; Coêlho, 2025). The challenge is not merely to "include" these students, but to allow their knowledge to question and transform the curriculum.

In this context, social movements can no longer be understood solely as forces for political pressure. They must also be recognized as legitimate producers of knowledge. They constitute educational spaces in which learning is inseparable from collective practice. As Maria da Glória Gohn observes:

The fundamental change produced by the everyday practices of popular movements concerns the nature of social relations. This is not merely a process of individual learning that results in the politicization of participants. That is one of its most visible aspects. It involves the development of individual consciousness. The most important result, however, occurs at the collective level (Gohn, Maria da Glória, 2012, p. 16).

Social movements thus function as spaces of collective learning in which citizenship ceases to be an abstract concept and becomes a lived practice. Through participation, people develop a critical awareness of the structures around them and transform indignation into conscious social action. This participatory and contextual character also enables popular education to confront exclusion and respond critically to technological and social changes (Pinheiro, 2023).

Education that extends beyond institutional walls becomes especially evident through the concept of non-formal education. According to Gohn (2012), this modality is characterized by political intentionality and differs both from the bureaucratic rigidity of formal systems and from the unsystematic nature of everyday informal learning. Contemporary analyses add that its flexibility, collaboration, and capacity to respond to participants' circumstances can complement schooling and strengthen social development (Souza, Rocha, and Santos, 2024).

The central transformation occurs in the nature of social relationships. Learning is not only an individual process of politicization but also a collectively consolidated construction. In popular movements, people learn to participate by participating, making citizenship concrete through the exercise of claiming rights. The MTST experience in Recife illustrates this relationship by combining adult literacy, territorial organization, the right to housing, and human dignity within the same popular education project (Alcântara and Brutscher, 2024).

This discussion aligns with Arroyo's (2012) defense of a pedagogy that recognizes the human being as a whole. When knowledge produced through struggle and community life is validated, citizenship education no longer fits within rigid curricula and instead takes shape through social practices and active participation. The continued relevance of Freirean popular education confirms that dialogue and collective problem-posing remain central to emancipatory practices and public initiatives serving marginalized populations (Paulo, Carrillo, and Faria, 2025).

Invisibilized knowledge and the praxis of transformation

Understanding educational processes requires a perspective that extends beyond formal institutions and recognizes social movements as privileged spaces for producing knowledge and subjectivities. This pedagogy of conflict challenges academia's monopoly over legitimate knowledge and reveals experiences historically maintained in subordinated positions. In opposition to abyssal thinking, social movements create conditions for epistemological plurality. Recent research on the ecology of knowledges emphasizes that critical intercultural education depends on confronting standardization, monoculturalism, and the universalization of a single epistemological model (Nascimento and Candau, 2024).

The educational practices of the MTST and MST exemplify this dynamic by fostering dialogue between scientific rigor and urban, rural, community-based, and ancestral knowledge. In these contexts, Santos's (2007) ecology of knowledges becomes concrete: knowledge ceases to be static and becomes a dynamic instrument of liberation. Studies of Movimento 21 and an MTST literacy project demonstrate that popular education is built through resistance, territorial belonging, and the collective struggle for rights (Guerreiro, Silva, and Carvalho, 2023; Alcântara and Brutscher, 2024).

This break with Eurocentric logic challenges the practical production of absences. By validating knowledge previously rendered invisible, people resist the waste of experience and transform deprivation into collective power. Political participation thus becomes praxis: interpreting reality, taking collective action, and critically evaluating the effects of that action.

A dialogic pedagogy transforms the reading of reality from a passive exercise into a project of intervention. Education developed within social movements can therefore cultivate the critical transitive consciousness described by Freire (1987), enabling citizens to become subjects rather than objects of history. Gohn (2012) also emphasizes that this multiplying pedagogical process consolidates the critical consciousness necessary for citizenship. The contemporary renewal of Freire's legacy demonstrates that this perspective remains relevant to literacy education, teacher preparation, social movements, and public policy (Paulo, Carrillo, and Faria, 2025).

Tensions and complementarities: formal schooling and non-formal education

The relationship between schools and non-formal educational spaces constitutes a dialectical unity capable of strengthening comprehensive human development. Schools organize access to systematized knowledge, while social movements and other collective spaces give political and experiential substance to theoretical knowledge. Rather than being mutually exclusive, these modalities can complement each other when institutions recognize the flexibility, accessibility, and participatory nature of non-formal education (Souza, Rocha, and Santos, 2024).

For Saviani (2016), public schools have the social function of guaranteeing access to scholarly and universal knowledge because scientific understanding provides tools for interpreting society and class relations. This education, however, risks becoming abstract when it becomes detached from urgent social needs. The Freirean reading of the world must therefore accompany the reading of the word, and social movements provide territories of praxis in which systematized knowledge encounters direct action. Accounts of teacher preparation developed in collaboration with popular movements also indicate that academic education becomes more meaningful when it engages with collective struggles and concrete social contradictions (Torres, 2024).

José Carlos Libâneo emphasizes the relationship between education and society's formative processes, observing that human beings have historically established cooperative relationships to ensure their survival (Libâneo, 1994). This cooperation is educational because it produces shared

meanings, norms, skills, and forms of participation that precede and extend beyond formal schooling.

This complementarity therefore lies in the fact that schools can provide theoretical tools for interpreting reality, while collective action develops political subjects through experience. The point is not to replace formal education with non-formal education, but to recognize that social movements pressure schools to become more inclusive and responsive to contemporary demands. The ecology of knowledges strengthens this relationship by fostering exchange and mutual enrichment between socially valued school knowledge and other forms of knowing (Nascimento and Candau, 2024).

Challenges and limitations of education within social movements

Despite their formative potential, educational practices within social movements face obstacles that extend beyond logistical limitations. A central difficulty is institutional resistance to knowledge that does not conform to the metrics of formal education. The "large estate of knowledge" discussed by Arroyo (2012) excludes pedagogies of resistance by classifying them as merely political or unsystematic. The scarcity of studies directly connecting popular education, social movements, and specific groups such as children also shows how certain experiences remain peripheral to academic agendas (Soares, 2022).

Institutional refusal to validate the knowledge produced by social movements is not merely bureaucratic; it also promotes spatial and intellectual segregation. In analyzing how educational systems respond to these groups, Arroyo (2012) argues that the separation among social collectives has become radical:

It is not merely a matter of margins, but of being separated by walls and barriers. Margins and borders can be approached; walls and barriers prevent any attempt to cross. They are built by the groups on the inside to prevent any attempt by those on the outside to pass through (Arroyo, 2012, p. 43).

The image of walls helps explain why schools frequently fail to be inclusive. These walls take the form of rigid curricula, Eurocentric norms, and procedures through which institutions determine which knowledge can be validated. People involved in social movements are not merely at the margins of the system; their experiences may be actively prevented from receiving scientific and curricular recognition. Breaking down these boundaries requires more than pedagogical reform. It requires dismantling the epistemological barriers that prevent schools from recognizing themselves in students' struggles and lives. Inclusion must not be treated as a favor granted by the institution, but as recognition of people's dignity and the plurality of knowledges.

For Arroyo (2012), social movements do more than fight for rights; through struggle, they also produce knowledge, values, and pedagogies. The educational challenge is not simply to bring schools into the spaces occupied by social movements, but to allow the pedagogy of struggle to permeate the schools themselves. Experiences with rap, freestyle battles, hip-hop, and funk show that when cultural knowledge from marginalized communities enters educational practice with a critical purpose, it can promote antiracist learning, student participation, affirmation of identity, and connections between curriculum and territory (Tejera and Siqueira Junior, 2025; Coêlho, 2025).

Material hardship, discontinuous public support, and institutional instability can also limit the systematization and continuity of educational initiatives. Relationships with formal schools often remain fragmented, and lived struggles may be forced into rigid curricula instead of being welcomed through an ecology of knowledges. Rural and urban studies nevertheless show that social movements continue to develop educational responses under adverse conditions by connecting literacy, political education, territorial resistance, and the defense of rights (Guerreiro, Silva, and Carvalho, 2023; Alcântara and Brutscher, 2024). Another challenge is preventing non-formal education from being

reduced to survival training and losing the critical, emancipatory purpose defended by Freire (1987).

Overcoming these limitations requires that the relationship between systematized knowledge and knowledge gained through experience be treated not as a concession by schools but as a necessary dialectical unity. Building pedagogical bridges depends on formal institutions' ability to remain receptive to lessons from occupations, rural territories, cultural collectives, and marginalized urban communities. Critical intercultural education offers a viable direction by replacing epistemological hierarchy with dialogue, productive tension, and mutual learning among different forms of knowledge (Nascimento and Candau, 2024).

CONCLUSION

The analysis indicates that a rigid opposition between formal and non-formal education is insufficient to explain the complexity of contemporary learning. Social movements function as educational spaces that challenge academia's monopoly on knowledge and constitute territories of resistance, solidarity, and knowledge production. In these contexts, education ceases to function as a unilateral transfer of content—the banking model criticized by Freire—and becomes a means of reading and intervening in the world.

Recognizing historically marginalized people as producers of knowledge and culture is essential to cognitive justice and to overcoming the abyssal thinking present in educational institutions. The ecology of knowledges is not merely a theoretical aspiration. It is realized when life trajectories, community memories, work, cultural expressions, and political experiences enter into dialogue with systematized knowledge. Schools and universities should therefore not subordinate these forms of knowledge but establish relationships grounded in otherness, rigor, and mutual recognition.

Human emancipation requires epistemologically open educational institutions capable of learning from the streets, rural communities, occupations, and marginalized urban communities. Connecting scientific rigor with collective political experience strengthens both dimensions: it expands the social meaning of school knowledge and provides organized struggles with additional tools for interpreting reality. Through this dialogue, education can respond more fully to contemporary inequalities and serve as a means of freedom, democratic participation, and social transformation.

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STOCKOUTS AS SYSTEMIC INDICATORS: OMNICHANNEL CONSISTENCY AND INVENTORY MANAGEMENT IN PARAGUAYAN RETAIL

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ABSTRACT

Paraguayan retail is undergoing a change that goes beyond the adoption of digital channels: it extends to how companies coordinate work, share information, and make decisions. Tensions emerge when the commercial promise exceeds what operations can deliver, and they intensify when processes, systems, and decisions remain fragmented. Among the symptoms of this misalignment, stockouts stand out because they affect operational performance and erode customer trust. The conventional interpretation treats them as inventory-control failures. This study proposes an organizational and systemic perspective. Its purpose is to examine how omnichannel consistency, inventory management, and stockouts are related in Paraguayan retail, with attention to the organizational conditions that facilitate or hinder consistent execution. The study adopts a qualitative, documentary-analytical approach, complemented by professional experience in the sector. The analysis suggests that stockouts function as systemic indicators arising from three conditions: fragmented processes, inconsistent information, and decisions based on divergent objectives. Thus, omnichannel

consistency does not depend exclusively on technological investment and can be understood as an emergent property of organizational coherence. The study contributes a framework that reframes stockouts as structural signals.

Keywords: Omnichannel retail. Inventory management. Stockouts. Organizational alignment. Paraguay.

INTRODUCTION

The retail sector has changed substantially over the past ten years. Digital channels have expanded, e-commerce has moved from a niche to the mainstream, and customers now move across platforms within a single purchase decision (Brynjolfsson et al., 2013; Verhoef et al., 2015). The pace of this change varies by market, but its direction is consistent.

Customer expectations have followed. Today, customers expect to find the same product, at the same price, with the same delivery promise, wherever they search. Omnichannel strategies, once a differentiator, are now a competitive baseline. Implementing them, however, is a different challenge from describing them.

Effective omnichannel retail depends on the integration of processes, systems, and organizational structures to deliver a frictionless customer experience (Berman & Thelen, 2018; Hübner et al., 2016). Many organizations struggle at this point, and the gap widens in emerging markets, where digital tools often arrive faster than the organizational capabilities needed to use them effectively.

Paraguay is also experiencing the progressive adoption of digital channels in the retail sector. However, this evolution creates challenges related to the coordination of internal processes. The result is hybrid: digital interfaces layered over operating routines designed for another era. This friction is visible in inventory management, particularly in recurring stockouts.

Stockouts matter in omnichannel environments because they expose the gap between what is promised and what is delivered. That gap affects operational efficiency and, more enduringly, customer trust (Heizer et al., 2020; Christopher, 2016). A customer who finds a product advertised as available and then discovers during the purchase process that it is not may lower expectations and become less inclined to purchase again.

The conventional view treats a stockout as an inventory-control failure. This interpretation is insufficient to explain the complexity of the phenomenon.

It reasonably explains isolated incidents, but it does not account for why stockouts persist in organizations that have invested in better tools.

This study proposes that stockouts can be understood as visible manifestations of a deeper organizational misalignment. Three conditions contribute to their occurrence: fragmented processes, inconsistent information across sources, and decision structures based on divergent objectives. Together, they shape the organization's ability to sustain omnichannel consistency over time.

This article analyzes the relationship among omnichannel consistency, inventory management, and stockout reduction in Paraguayan retail. The objective is to provide an integrated organizational perspective that can inform both academic research and the day-to-day decisions managers actually face.

METHODOLOGY

This study adopts a qualitative approach with a documentary-analytical design and exploratory scope, complemented by accumulated professional experience in the Paraguayan retail sector as a contextualization resource. This choice reflects the nature of the research problem, because understanding stockouts as organizational phenomena requires interpreting the interaction among processes, information, and decisions.

The documentary corpus integrates peer-reviewed contributions from three converging fields: supply chain management, omnichannel retail, and organizational theory. These sources were selected for their conceptual relevance to the relationship among channel consistency, inventory

management, and organizational alignment. They were subsequently examined through a critical reading aimed at identifying recurring conceptual categories and relationships. The analysis followed an iterative conceptual coding process in which recurring themes were grouped into three organizing dimensions: process integration, information consistency, and decision alignment.

Professional experience was used exclusively as a resource for contextualizing and interpreting the phenomenon in the Paraguayan market. This component does not constitute fieldwork or an independent empirical source. Because this is a conceptual and exploratory study, its purpose is to build an integrated framework rather than test hypotheses or establish causal relationships. The limitations of the approach and the conditions required for subsequent empirical validation are addressed in the final considerations.

THEORETICAL FRAMEWORK

Omnichannel retail as a transformation of the management model

Omnichannel retail is not simply a stage that follows the multichannel approach; rather, it represents a structural change in how retail management is organized. Whereas multichannel approaches allow channels to operate in parallel with limited coordination, omnichannel approaches seek to provide consistent, frictionless interaction across the different customer touchpoints (Verhoef et al., 2015).

This transformation goes beyond the adoption of digital technologies because it entails reconfiguring organizational structures, processes, and decision-making mechanisms. Berman and Thelen (2018) note that effective omnichannel implementation requires alignment among marketing, operations, and information systems to maintain consistency in value delivery.

Distribution systems must also be redesigned. Options such as in-store pickup, home delivery, and cross-channel returns add operational complexity and require coordination among functions that previously operated independently (Hübner et al., 2016).

There is also a shift from channel-centered structures to customer-oriented structures. Although this transition may appear straightforward conceptually, in practice it challenges existing organizational silos because sales, logistics, and customer service must act as parts of an integrated system rather than optimizing only their own performance indicators.

Available evidence suggests that this transformation is often incomplete. Some organizations add digital channels without comprehensively redesigning their processes, resulting in hybrid configurations that can create execution inconsistencies. Inventory management and service delivery are two areas in which these inconsistencies become particularly visible.

Omnichannel consistency as an organizational outcome

Omnichannel consistency describes the degree of coherence perceived by customers in areas such as pricing, product availability, service conditions, and the overall shopping experience. Although it is manifested in the customer experience, the conditions that explain it are also found within the organization.

Berman and Thelen (2018) point out that consistency does not arise solely from integrating customer-facing interfaces. Internal processes and systems must also be synchronized. In this sense, what the customer perceives reflects the organization's internal ability to coordinate its resources, processes, and information.

Melero et al. (2016) show that inconsistencies across channels reduce customer trust and

negatively affect purchase intention. Differences in availability data between digital channels and physical stores, as well as discrepancies in prices or service conditions, do not always result from isolated errors. They may also be related to structural causes, such as fragmented information systems, insufficiently integrated processes, and the absence of shared decision-making criteria.

From this perspective, omnichannel consistency is not merely an outcome of channel design but an emergent property of organizational alignment. Consequently, the analytical focus shifts from customer-facing interfaces to the underlying organizational dynamics that help shape the customer experience.

Inventory management in omnichannel environments

Traditionally, inventory management has been understood as a balance between holding costs and service levels. In omnichannel environments, this balance becomes more complex because inventory becomes a central element of the value offered to customers rather than merely a component of operating cost.

Chopra and Meindl (2019) argue that inventory decisions should consider responsiveness and flexibility in addition to efficiency. Demand variability across multiple order-fulfillment and delivery options makes the traditional optimization logic insufficient.

Complexity increases because the same inventory must simultaneously serve transactions conducted through physical and digital channels. Simchi-Levi et al. (2021) identify the lack of integrated inventory visibility as one of the main sources of inefficiency in modern retail systems.

In the Paraguayan market context, the problem is not always related exclusively to the physical absence of the product. It may also arise from its location, allocation, or visibility across channels. In these cases, the inventory exists but is not available to the channel or customer demanding it.

Real-time data and analytics have increased requirements for inventory accuracy. However, the effectiveness of these tools depends on the quality of the data they process. In fragmented environments, data-driven systems may amplify existing inconsistencies rather than resolve them by generating technically precise reports from unreliable underlying information.

Stockouts as systemic indicators

A stockout occurs when a product is unavailable at the time demand arises. The traditional perspective focuses its analysis on replenishment processes and demand forecasting.

Omnichannel environments broaden this concept. In this context, a stockout may also include situations in which the information presented to the customer does not match actual inventory, such as when a product appears available in one channel but cannot be delivered, or when it physically exists but is not visible to the channel that requires it.

Heizer et al. (2020) document the direct impact of stockouts on customer satisfaction and operational performance. Christopher (2016) examines the same phenomenon from a supply chain perspective and notes that supply chain inefficiencies can manifest as service failures, among which product unavailability is one of the most visible.

From a systemic perspective, a stockout may indicate deeper deficiencies. It can help identify points at which coordination among processes, systems, and decision structures is experiencing difficulties.

For example, discrepancies between inventory data in physical and digital channels may be related to delayed system updates or insufficient data-governance practices. Likewise, promotional

campaigns implemented without first verifying inventory availability may generate demand that operations are unable to meet. In both cases, the stockout is the visible event, while organizational misalignment represents a possible underlying cause.

This perspective shifts the analytical focus from reactive correction to structural diagnosis. The question is no longer limited to how to correct a specific stockout; instead, it focuses on identifying which organizational elements contribute to its recurrence.

Process management and organizational alignment

Process management offers a way to overcome traditional functional silos. This approach proposes organizing work around value streams that cross different functional areas rather than structuring it exclusively around departments that optimize their results independently. In omnichannel retail, this perspective is especially relevant because the customer experience depends on processes that integrate sales, logistics, information technology, and customer service.

A process-oriented organization is structured around end-to-end workflows. Predominantly functional organizations, by contrast, may encourage each department to optimize its own performance indicators even when doing so negatively affects the system as a whole. This fragmentation creates barriers to coordination and encourages inconsistencies.

Moving toward process integration is not merely a structural exercise. It also requires cultural change that enables roles to be redefined, shared performance indicators to be established, and sustained collaboration practices to be developed among organizational units. Without these conditions, improvements implemented in inventory, digital platforms, or logistics may remain confined to specific areas and lose continuity over time.

Data governance and decision-making

Data governance plays a less visible but decisive role in this discussion. Its purpose is to help ensure that the information used in decision-making is reliable, consistent, and aligned with organizational needs. In omnichannel environments, where decisions increasingly depend on near-real-time data, information quality becomes an important condition of organizational performance.

Davenport and Ronanki (2018) maintain that advanced analytics and artificial intelligence produce meaningful results when supported by high-quality data and clearly defined processes. Without these conditions, technology can generate apparently precise results from unreliable inputs.

Sharda et al. (2020) extend this argument to organizational structure. Data-driven decision-making requires not only technical capability but also structures that support integration and shared interpretation of information across different functions.

In fragmented environments, these gaps may appear in everyday operations. Demand forecasts may differ across departments, inventory records may be inconsistent, and decisions may be based on incompatible versions of the same reality. As a result, some channels may experience overstock while others experience stockouts.

Therefore, data governance should be considered a fundamental element of omnichannel consistency rather than merely a maintenance function belonging to the information technology department. Proper implementation helps maintain accurate, accessible, and consistent information, providing a foundation for coordinated decision-making.

PRESENTATION AND ANALYSIS OF RESULTS

The analysis begins by questioning a common assumption: that technological capability is the primary driver of omnichannel performance. The review shifts attention toward organizational alignment as a central condition for achieving operational coherence. This relationship is particularly relevant in the Paraguayan context, characterized by the progressive adoption of digital channels and tools in the retail sector.

The growing availability of digital tools and advanced analytics solutions has not automatically translated into greater operational coherence. In some cases, new technologies are added to existing organizational structures with insufficient levels of integration, which may reinforce preexisting inconsistencies rather than resolve them.

Inventory management and recurring stockouts make this phenomenon visible. Although these events manifest at the operational level, their causes may be related to broader organizational conditions.

From this perspective, omnichannel retail is not exclusively a technological challenge but an organizational transformation that requires the simultaneous alignment of processes, information, and decision-making mechanisms.

The organizational nature of omnichannel challenges

The conceptual analysis suggests that several of the main barriers to omnichannel consistency are organizational rather than exclusively technological. Functional areas such as marketing, logistics, and operations may work with different objectives and performance indicators. This fragmentation limits coordination capacity and may affect consistency across channels.

A representative example is the design of promotional strategies without adequate coordination with inventory availability. This situation may produce increases in demand that operations cannot meet, customers encountering out-of-stock products, and items advertised in digital channels that ultimately are unavailable. As a result, service-level failures arise for which responsibility may not be clearly defined. At the same time, logistics operations may meet their efficiency indicators in isolation even when those indicators conflict with omnichannel service expectations.

These misalignments are not merely isolated operational errors; they may reflect structural tensions within the organization that manifest as failures perceived by customers. Addressing them requires moving from functional optimization toward systemic coordination, a transformation involving deeper changes than the simple acquisition of technological tools.

Inventory management as a point of organizational integration

Inventory management is a critical point of integration between commercial strategy and operational execution. In omnichannel environments, inventory is not a passive resource but an active component of value creation whose performance reflects the degree of coordination within the organization.

Effective inventory management depends on technical accuracy, but also on its integration with broader organizational processes. When inventory systems operate independently from commercial planning or customer service, the likelihood of inconsistencies increases.

One situation that may occur in practice is the existence of multiple, uncoordinated inventory records across different systems. These records represent the same physical reality but may provide divergent information. As a result, products may appear available when they actually are not,

transactions may fail, and customer trust may deteriorate. Likewise, inventory-allocation logic may respond to internal priorities rather than customer needs. This demonstrates the need to treat inventory management as a cross-functional process rather than an exclusively logistics activity.

Stockouts as manifestations of systemic misalignment

Stockouts can be reinterpreted from a systemic perspective. Traditionally, they have been considered operational inefficiencies. Although this interpretation is valid, it is insufficient to explain their recurring nature. Their persistence may reflect organizational difficulties in maintaining coherence among processes, information systems, and decision-making mechanisms.

The analysis identifies three main sources of misalignment. The first is process fragmentation, which occurs when commercial, logistics, and digital processes are not integrated end to end. The second is information inconsistency, generated when data from different systems do not agree. The third is decision-making misalignment, which occurs when decisions are made without shared criteria across the organization's different areas.

Figure 1. Three Dimensions of Organizational Misalignment

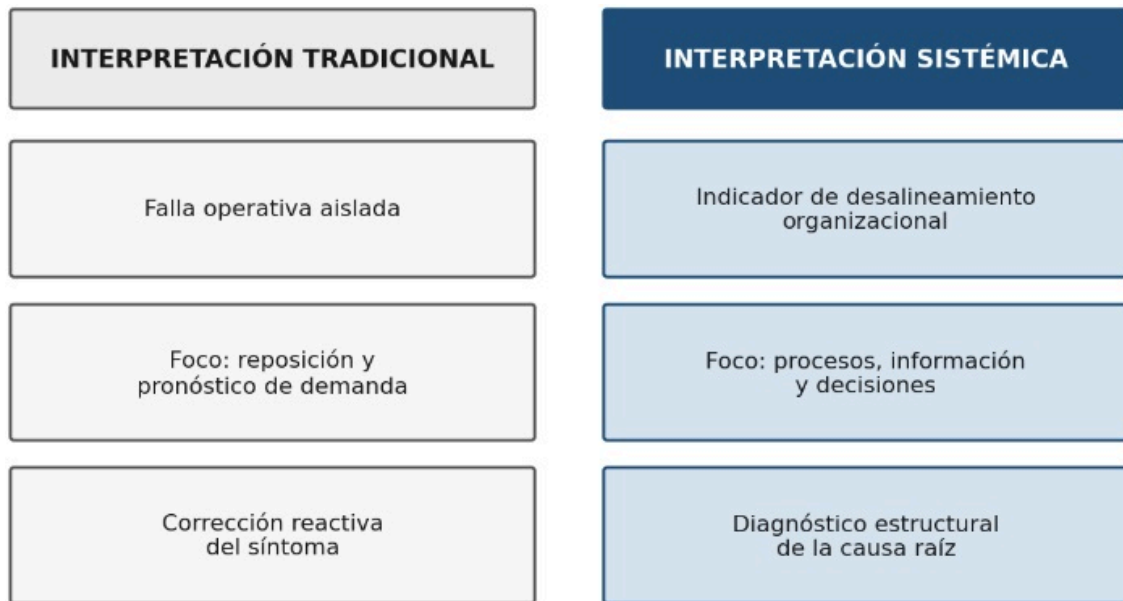


Source: Authors' own work (2026).

These dimensions do not operate in isolation; rather, they form an interconnected system in which deficiencies in one dimension can spread to the others. For example, inaccurate inventory data may feed inadequate demand forecasts, lead to poor replenishment decisions, and ultimately generate stockouts. This sequence is not always visible to customers, although its effects may be directly manifested in their shopping experience.

The systemic perspective changes how organizational interventions are interpreted. Correcting individual symptoms, such as making a one-time adjustment to a forecast or accelerating a replenishment, may be insufficient to address the underlying mechanisms. Therefore, sustainable stockout reduction requires strengthening organizational alignment in addition to implementing specific operational adjustments.

Figure 2. Traditional versus Systemic Interpretation of Stockouts



Source: Authors' own work (2026)

A systemic interpretation of omnichannel inconsistency

Based on the analysis developed, omnichannel inconsistency can be interpreted as an emergent manifestation of organizational misalignment. Problems perceived by customers, such as inaccurate availability information, delivery delays, and price differences across channels, may constitute observable outcomes of structural deficiencies related to the management of processes, information, and decisions.

This perspective challenges approaches focused exclusively on optimizing individual components. As an alternative, it proposes an integrated intervention that considers the organization as an interdependent system. From a managerial standpoint, this entails reviewing organizational design, redefining roles, and establishing effective coordination mechanisms among different areas that are capable of responding appropriately under operational pressure.

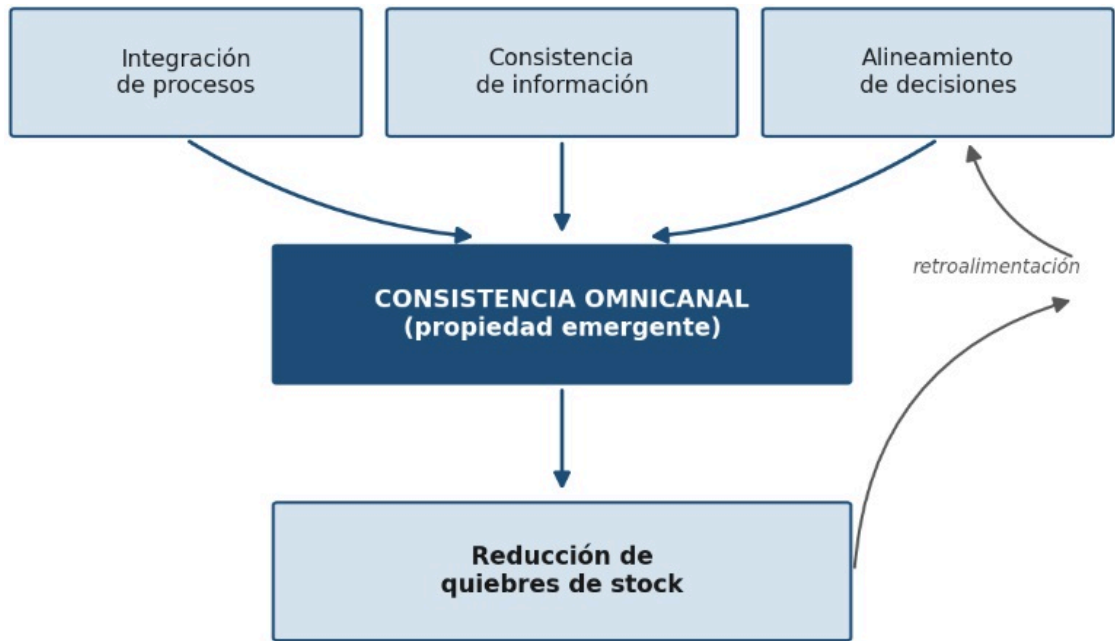
A conceptual framework: stockouts as systemic indicators

Based on the analysis, a conceptual framework is proposed in which stockouts function as systemic indicators of organizational misalignment. The framework is structured around three central dimensions: (1) process integration, (2) information consistency, and (3) decision alignment.

These dimensions interact dynamically. A weakness in any one of them may produce distortions in the others and subsequently manifest as an operational inconsistency, including stockouts. Within this framework, omnichannel consistency is not considered a direct and exclusive result of technological implementation, but rather an emergent property that becomes stronger when the organizational dimensions are aligned.

The framework provides a structure for diagnosing organizational problems and directing interventions toward their possible underlying causes rather than focusing solely on their visible manifestations. In this way, it can help identify difficulties that limit the implementation and continuity of improvement programs in the retail sector.

Figure 3. Systemic Organizational Alignment Framework for Omnichannel Consistency

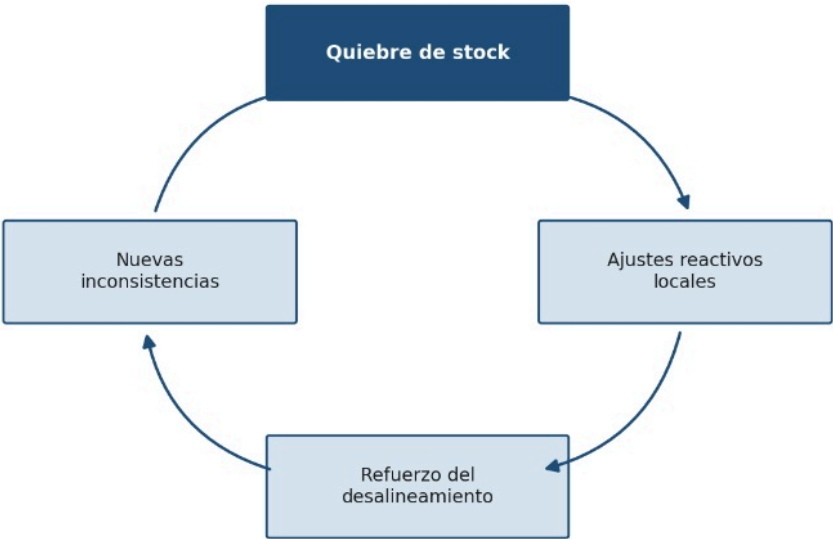


Source: Authors' own work (2026)

Figure 3 represents the proposed systemic logic. Stockouts are not interpreted solely as isolated operational failures but as possible outcomes of misalignment among organizational dimensions. Process integration, information consistency, and decision alignment interact to promote or constrain omnichannel consistency. When alignment weakens, inconsistencies may arise that ultimately manifest as stockouts.

The feedback loop represents a potentially recurring dynamic. Stockouts not only reflect existing problems; they may also influence subsequent decisions and adjustments. If these responses are limited to correcting the specific event without addressing its organizational causes, they may contribute to reproducing the same misalignment that caused the problem. Consequently, the system should not be interpreted as a static structure.

Figure 4. Feedback Loop: Stockouts and Organizational Adjustment



Source: Authors' own work (2026)

Managerial implications

Several implications for managerial practice follow from the proposed conceptual framework.

First, approaches focused exclusively on technology have limitations when they do not consider organizational alignment. Investments in digital tools and analytics should be accompanied by process integration and alignment of decision structures. Otherwise, they may intensify preexisting organizational deficiencies.

Second, data governance requires priority attention. The availability of reliable, consistent, and accessible information provides a foundation for effective decision-making and for maintaining coherence across channels.

Third, inventory management should be regarded as a cross-functional process. This requires close coordination among commercial, logistics, and digital functions, as well as a clear definition of responsibilities related to end-to-end process management.

Finally, the required transformation is both cultural and structural. Collaboration and shared accountability across functional areas are practices that take time to consolidate. Therefore, omnichannel transformation should be approached as a medium- and long-term organizational process rather than merely as a limited-duration initiative.

CONCLUSION

The analysis of the transformation of Paraguayan retail supports the conclusion that omnichannel consistency does not depend exclusively on the adoption of technology. Although digital tools and advanced analytics are increasingly accessible, their effectiveness is conditioned by organizations' ability to integrate processes, maintain consistent information, and coordinate their decisions.

From this perspective, stockouts can be interpreted as systemic manifestations of organizational misalignment rather than merely as isolated operational failures. Their recurrence may signal structural deficiencies related to fragmented processes, inconsistent information, and insufficiently coordinated decisions, which are unlikely to be resolved through isolated technological investments.

Under this interpretation, inventory management takes on a strategic role. It connects commercial intent with operational execution, and its effectiveness depends both on technical accuracy and on integration with organizational processes and structures.

Consequently, omnichannel consistency can be understood as an emergent property of organizational coherence. Improving retail performance requires complementing technological strategies with actions aimed at process integration, information consistency, and decision alignment.

Theoretical contribution

The study's main theoretical contribution is to propose interpreting stockouts as systemic indicators of organizational misalignment.

The literature has examined stockouts primarily from operational and logistics perspectives. This study integrates contributions from supply chain management, omnichannel retail, and organizational theory to provide a broader interpretation. By considering stockouts as phenomena emerging from the interaction among process integration, information consistency, and decision alignment, the study broadens the theoretical discussion through a multidimensional view of retail performance.

The proposed framework also helps connect operational and organizational approaches applied to the study of retail. From this perspective, internal coherence, in addition to technological capability,

is a central condition for service reliability in omnichannel environments. The framework provides a conceptual structure for analyzing this relationship.

Managerial contribution

From a managerial standpoint, the study offers several guidelines for organizational practice.

First, isolated technological solutions have limitations. Investments in digital tools and analytics should be complemented by actions aimed at integrating processes and aligning organizational structures. Otherwise, technology may become a costly and underused resource.

Second, data governance needs to be strengthened. The availability of reliable and consistent information is essential to support informed decisions and maintain alignment across channels. Therefore, this dimension should receive attention proportional to its importance within the omnichannel strategy.

Third, inventory management should be reframed as a cross-functional process. Coordination among commercial, logistics, and digital functions is an essential requirement for omnichannel management and requires a clear definition of responsibilities.

Finally, organizational transformation is a fundamental condition. Cultural change, shared performance indicators, and collaboration across functional areas help sustain structural changes over time.

Limitations and future research

Several limitations should be considered when interpreting the results of the analysis.

The study adopts a qualitative documentary-analytical approach, complemented by professional experience as a contextualization resource. This combination allows for a contextualized interpretation of the phenomenon but does not permit statistical generalizations or the establishment of causal relationships. Consequently, the framework should be considered an interpretive proposal rather than an empirically tested causal model.

The focus on Paraguayan retail also limits the direct transferability of the results. Other markets, with different levels of maturity, regulatory environments, and organizational cultures, may exhibit variations in these dynamics. Although the framework may serve as a reference in other contexts, its application will require adaptations and subsequent validation processes.

Future research can extend this work in several directions. Case studies and quantitative analyses could empirically evaluate the relationships proposed in the conceptual framework. Likewise, comparative studies across countries or retail formats could strengthen its transferability. Finally, analyzing emerging technologies, such as artificial intelligence and predictive analytics, under different organizational conditions could provide deeper insight into aspects that this study addresses only exploratorily.

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iJERResearch

International Journal of Education and Research

Vol. 1, Number 2, September - 2026 | Peer-Reviewed Journal

ISSN 2764-9733 | ijerresearch.org

DOI: 10.5281/zenodo.23062044

THE MERCOSUR EDUCATIONAL SYSTEM AND THE CHALLENGES OF CURRICULAR HARMONIZATION: AN ANALYSIS OF REGIONAL INTEGRATION AND ITS EVOLUTION

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ABSTRACT

This study analyzed the evolution and current challenges of the MERCOSUR Educational Sector (SEM), focusing on curricular harmonization and degree recognition among the member states. The central research question examined how the bloc's documentary framework reflects the pursuit of such harmonization and which regulatory obstacles continue to hinder the realization of regional educational citizenship. A qualitative documentary and bibliographic methodology was employed at an exploratory-descriptive level, based on content analysis of official agreements and regulations. The main findings indicate that, although significant progress has been made in establishing a regulatory foundation for academic mobility, practical implementation is hampered by national asymmetries, bureaucratic barriers, and the absence of unified information systems. The study concludes that harmonization requires moving beyond unilateral views of sovereignty toward shared regional systemic responsibility. Effective educational integration depends on continuous monitoring mechanisms that ensure transparency and mutual trust among the bloc's educational institutions.

Keywords: Curricular harmonization. Degree recognition. Educational cooperation. Regional integration. MERCOSUR educational sector (SEM).

INTRODUCTION

Regional integration within MERCOSUR, established by the Treaty of Asunción in 1991, outlined a vision that extends beyond mere economic and trade convergence, encompassing the educational and cultural spheres as fundamental pillars of sustainable development and social cohesion among the member states. In the contemporary context, education is understood as a strategic asset that underpins regional identity and the bloc's competitiveness in the face of globalization. The MERCOSUR Educational Sector (SEM) therefore emerged with the mission of coordinating a permanent space for collaboration aimed at facilitating student and professional mobility through the recognition of studies and degrees, thereby promoting what is known as regional citizenship.

Nevertheless, the historical trajectory of the SEM shows that building this common educational space is not a linear process, but rather a journey marked by structural complexities and national resistance. The diversity of educational systems, disparities in curricular structures, and heterogeneity of national legislation pose serious challenges to the intended harmonization. Political intentions expressed in agreements and ministerial declarations often encounter obstacles in the bureaucratic and technical realities of Ministries of Education and higher education institutions, resulting in a gap between regional standards and local practice. This fragmentation ultimately shifts the burden of integration to the individual—the student or professional—who faces study-validation procedures that are slow, costly, and sometimes ineffective.

The scientific and social relevance of this study rests on the need to uncover these obstacles through a critical analysis of the bloc's evolving documentary framework. Investigating regulatory asymmetries and the theoretical factors that advance or constrain integration is essential to provide evidence for more assertive and less exclusionary transnational policies. The tension between educational sovereignty and regional integration lies at the center of current pedagogical debate and calls for a redefinition of the role of universities and funding agencies in developing quality criteria that both respect national identities and converge toward regional standards of excellence.

Against this background, this article is based on the premise that technical cooperation and intercultural dialogue are the mechanisms capable of transforming integration—currently perceived by many as merely theoretical—into a tangible and productive reality for regional citizenship. The overall objective of this study is to analyze the evolution of the MERCOSUR Educational Sector (SEM), focusing on the regulatory and theoretical challenges of curricular harmonization and degree recognition in consolidating regional integration.

METHODOLOGY

This study was characterized as qualitative documentary and bibliographic research, adopting an exploratory-descriptive level of inquiry to analyze the phenomenon of regional integration. The research design focused on an exhaustive analysis of the bloc's official agreements, declarations, and regulations in order to examine the historical development and contemporary challenges of the MERCOSUR Educational Sector (SEM). The research universe comprised all regulations, resolutions, and minutes produced by the SEM and the Associated States concerning educational integration and harmonization. An intentional, nonprobability sample was used, consisting of the most consequential regulatory frameworks that explicitly address curricular harmonization and degree recognition.

The analytical corpus consisted of publicly available official materials, including the Treaty of Asunción (1991), minutes of meetings of the Common Market Council (CMC), ministerial declarations, and specific regulations on academic mobility and institutional cooperation. The inclusion criteria established the rigorous selection of documents directly focused on educational

issues, regional integration, and degree recognition. Conversely, the exclusion criteria eliminated materials of a purely commercial, customs-related, or foreign-policy nature that had no direct connection to or impact on the bloc's educational sector. The analytical process was structured in three interdependent stages: assembling and systematically organizing the documentary corpus; conducting an exhaustive exploration of the material through thematic coding; and critically interpreting the findings in light of the study objectives.

Content analysis was applied to process and categorize the information extracted from the collected material. Four central analytical categories were established: “Integration Mechanisms,” focused on cooperation programs; “National Asymmetries,” addressing differences among systems; “Bureaucratic Barriers,” referring to implementation obstacles; and “Cooperation Programs,” examining support for mobility. To ensure scientific rigor and precision in data processing, simple descriptive statistics were used to count the frequency of keywords and categories in the official documents. Regarding ethical criteria, the study maintained strict academic rigor and was exempt from review by the Research Ethics Committee (CEP/CONEP), pursuant to CNS Resolution No. 510/2016, because it relied exclusively on public, official, publicly available documents; the accuracy and proper citation of all sources were ensured.

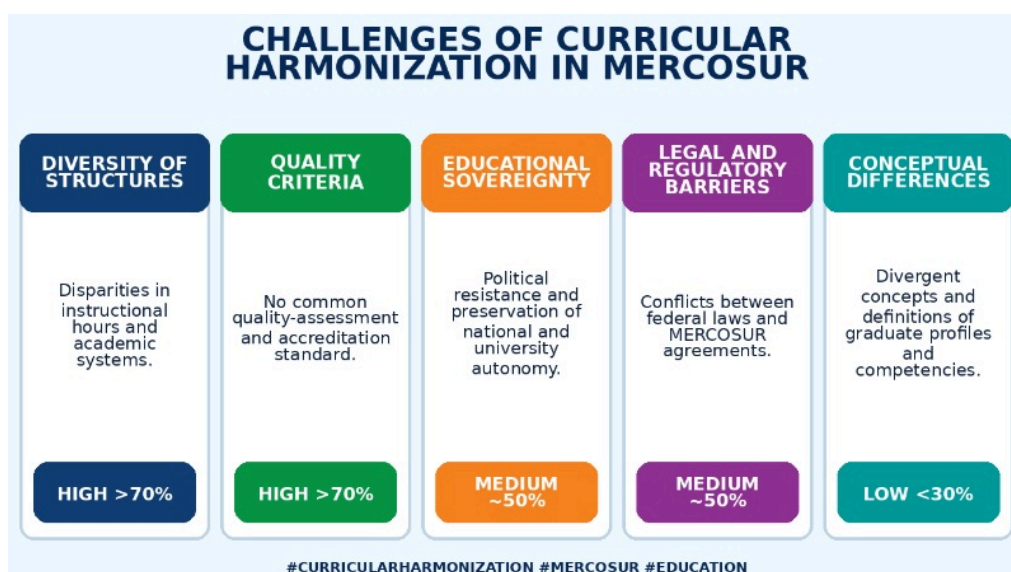
PRESENTATION AND DISCUSSION OF RESULTS

Curricular harmonization

The documentary and regulatory analysis conducted in this study identified that official bloc records treat curricular harmonization as the cornerstone and sine qua non requirement for successful regional educational integration. The convergence of knowledge and equivalence of competencies are not merely technical goals; they are prerequisites for consolidating a regional identity that transcends geographic borders.

Figure 1, developed from the methodological process of content analysis and term-frequency analysis, systematizes the main categories of challenges identified in the regulations examined—such as the Treaty of Asunción and SEM meeting minutes—that directly affect curricular convergence within MERCOSUR.

Figure 1: Matrix of Structural Challenges to Curricular Harmonization in MERCOSUR



Source: Prepared by the author based on the documentary analysis of the MERCOSUR Educational Sector (2025).

The data show that diversity of structures and the absence of unified quality criteria are the barriers most frequently identified in official documents and constitute serious impediments to seamless harmonization. Harmonization requires educational systems to converge toward common quality standards without erasing national identities or homogenizing cultures. This, in turn, demands systemic responsibility involving multiple institutional actors, from ministries to funding agencies.

Educational integration, under the paradigm analyzed, requires a broad reorganization of the educational space, including the restructuring of governance arrangements, validation mechanisms, and the political positions of states so that the cooperation system becomes truly effective. This means ensuring that all students and professionals can have their degrees recognized promptly and can participate actively and meaningfully in building regional citizenship. In the words of Almeida (2019):

Educational integration requires a broad reorganization of the educational space, including the restructuring of governance arrangements, validation mechanisms, and the political positions of states so that the cooperation system becomes truly effective. This means ensuring that all students and professionals can have their degrees recognized promptly and can participate actively and meaningfully in building regional citizenship. (ALMEIDA, 2019, p. 92)

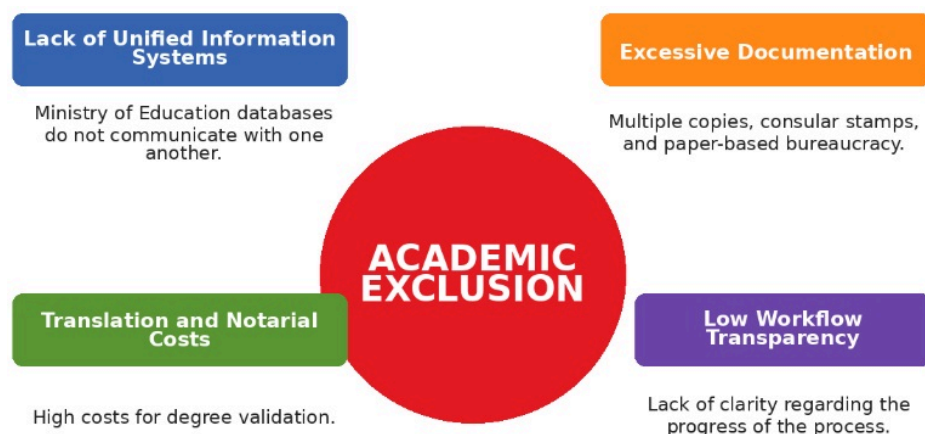
As Azevedo (2009) argues, integration within MERCOSUR faces a historical dilemma between market-oriented regulation—focused solely on the provision of services—and the construction of a public educational space, where curricular harmonization often runs up against the absence of supranational governance with binding authority. The lack of political coordination noted in the documents analyzed supports the view that nonconvergence generates isolation and weakens exchange programs, perpetuating a gap that disconnects education and training from the actual needs of an integrated regional labor market.

Degree Recognition

The recognition of degrees and diplomas is the fundamental technical and legal mechanism for making regional citizenship a reality, allowing intellectual capital to move freely across the borders of member states. However, the documentary analysis reveals that the transition from policy to practice is obstructed by a dense layer of procedural requirements that discourage academic and professional mobility.

Figure 2 systematizes the bureaucratic obstacles identified in the documentary processes of the MERCOSUR Educational Sector (SEM), highlighting the gap between political rhetoric and institutional implementation.

Figure 2: Matrix of Obstacles to the Automatic Recognition of Degrees in the SEM, 2025.



Prepared by the author based on an analysis of the MERCOSUR Educational Sector (2025).

(Interpretive description: The lack of unified information systems and limited transparency in validation workflows create a “perpetuation of the theoretical view of integration,” in which individuals bear the burden of state bureaucracy and fragmented data across the bloc's Ministries of Education.)

The results indicate that opaque procedures and limited timeliness of institutional responses are the most critical shortcomings of the current integration system. Although international agreements point toward automatic recognition for the purpose of continuing one's studies, national oversight bodies frequently impose revalidation criteria that disregard the principle of mutual trust. Overcoming these barriers requires mobility planning grounded in the rigorous validation of quality criteria and regional accreditation systems, such as ARCU-SUR, which ensure institutional credibility without undermining university autonomy.

Degree recognition, in its various forms, creates specific challenges in the area of curricular equivalence. Regulatory diversity requires information management to serve as the principal pillar for overcoming equivalence barriers, establishing a direct relationship between streamlined processes and a genuine increase in mobility flows. As Soares (2023) notes:

The recognition of degrees and diplomas, in its various forms, creates specific challenges in the areas of curricular equivalence and institutional credibility. Regulatory diversity requires information management to serve as the principal pillar for overcoming equivalence barriers, establishing a direct relationship between streamlined processes and a genuine increase in mobility flows (SOARES, 2023, p. 115).

Silveira (2016) supports this analysis by noting that the SEM has sought regulatory mechanisms to ensure quality; however, national asymmetries and the lack of integrated databases continue to create legal uncertainty for both institutions and graduates. The findings of this study confirm that informational and bureaucratic barriers prevent regional bodies from optimizing validation workflows, making the process selective and exclusionary for a large part of the academic community, whose members ultimately abandon mobility plans because of the cost and lengthy nature of the process.

Educational Cooperation and the Role of University Networks

This study analyzes educational cooperation within MERCOSUR as the driving force for reducing structural and pedagogical asymmetries among the member states. The documentary analysis revealed that the bloc relies on horizontal governance models grounded in solidarity and the sharing of best practices, which are essential to strengthening regional education.

Figure 3 details the support strategies identified as most effective in promoting integration, based on the records of the programs and university networks mapped in the study.

Figure 3: Strategies for Fostering Regional Integration and Observed Impacts

OBSTACLES TO AUTOMATIC DEGREE RECOGNITION IN MERCOSUR Main Challenges in Validating Degrees and Certificates in the Region		
OBSTACLE CATEGORY	DESCRIPTION OF THE CHALLENGE	MAIN IMPACTS
1. LACK OF UNIFIED INFORMATION SYSTEMS	Member-state Ministries of Education databases do not communicate with one another; digital integration is lacking.	Manual processes, slow verification, and a high risk of human error.
2. EXCESSIVE DOCUMENTATION	Multiple paper copies, consular stamps, authentication, and excessive documentary bureaucracy are required.	High administrative costs for applicants, frequent loss and misplacement of documents.
3. TRANSLATION AND NOTARIAL COSTS	Certified translations and notarized document validations are mandatory, generating high costs.	A financial barrier for students and professionals that makes the process more expensive.
4. LOW WORKFLOW TRANSPARENCY	Procedures lack clarity; online status tracking is unavailable and deadlines are undefined.	Uncertainty for applicants, difficulty planning careers, and a perception of inefficiency.

Diagnostic Study — MERCOSUR Corporate Perspective, 2025

Source: Prepared by the author based on the research project and analysis of SEM regulations (2025).

The data indicate that creating joint funding channels and using transparent calls for proposals are essential to translating regional needs into projects with tangible impact. Nevertheless, participation in discussion forums and the use of tools to monitor regional indicators still face engagement challenges, suggesting a partial disconnect between political bodies and the day-to-day practices of educational institutions.

The effectiveness of this integration depends on a paradigm shift that replaces unilateral logic with reciprocity. As the theoretical framework of this study indicates:

South-South Cooperation Theory will be firmly anchored in methodologies that promote horizontality, solidarity, and the sharing of best practices, all of which are essential to strengthening education within the bloc. The premise is to use cooperation as a focal point capable of generating and mobilizing joint projects in priority areas such as teacher education and technical education.

It is therefore concluded that the strategic use of information and the synergistic use of resources are indispensable tools for cooperation to promote genuine regional citizenship. The analysis of the strategies identified in the documentary research validates governance models that center academic mobility as the principal driver of integration.

CONCLUSION

The study concluded that the evolution of the MERCOSUR Educational Sector (SEM) has been characterized by robust regulatory development that has not yet been fully reflected in the everyday administrative and pedagogical practices of the member states. The objective of analyzing the challenges of curricular harmonization was achieved by demonstrating that the diversity of systems, national asymmetries, and persistent bureaucratic barriers act as forces of resistance to the consolidation of effective regional citizenship. The research showed that educational integration goes beyond merely signing international treaties; it requires a profound restructuring of political and institutional culture that privileges reciprocity and intercultural dialogue over the unilateral logic of educational sovereignty.

This study contributes to scholarship and the field of Education Sciences by critically mapping transparency gaps and identifying information management as the central strategic pillar for overcoming barriers to degree recognition. It advances the discussion by establishing a theoretical relationship between streamlined bureaucratic procedures and a genuine increase in mobility flows, providing a framework for analyzing comparative educational policies in regional blocs. In addition, the study strengthens the theoretical foundation for South-South Cooperation by validating horizontal governance models and university networks as essential mechanisms for mitigating asymmetries and promoting regional cohesion.

For future research, new studies should move beyond purely regulatory and documentary analysis and adopt empirical approaches that measure the actual impact of SEM policies on citizens' trajectories. Research should track graduates who have used regional mobility mechanisms in order to determine whether degree recognition has, in practice, enabled employment and academic advancement without the bureaucratic obstacles identified here. Such assessments would be essential to evaluate the effectiveness of regional citizenship beyond the language of legal instruments.

Within this framework, technological solutions should be implemented, including unified information systems and digital networks for real-time degree verification, to eliminate the need for slow and costly paper-based procedures. Another relevant line of inquiry would examine the continuing education of administrators and program coordinators within universities, seeking to understand how disseminating a culture of integration at the institutional level can reduce resistance. Understanding these mechanisms is a crucial step toward MERCOSUR's definitive consolidation of a common, supportive, and human-centered educational space.

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iJERResearch

International Journal of Education and Research

Vol. 1, Number 2, September - 2026 | Peer-Reviewed Journal

ISSN 2764-9733 | ijerresearch.org

DOI: 10.5281/zenodo.23062116

SCIENCE, TECHNOLOGY, EDUCATION, AND SOCIETY: AN INTEGRATED AND EXPANDED ANALYSIS OF TECHNOLOGICAL INNOVATIONS IN THE TEACHING-LEARNING PROCESS

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ABSTRACT

This scientific article sought to analyze, in an integrated manner, the complex relationship among Science, Technology, Education, and Society (STS), examining how the intentional incorporation of technological innovations redefines and enhances the contemporary teaching-learning process. The central research problem focused on pedagogical challenges and structural barriers to the use of technology at various educational levels. The method consisted of an in-depth literature review grounded in the analysis of a documentary corpus that included the author's previous studies and theoretical sources on multimedia resources, Instructional Design (ID), cognitive neuroscience, and curricular integration. The results showed that planning the use of technologies promotes more meaningful and lasting learning by making educational environments more dynamic and fostering student agency. The study concludes that the STS perspective requires technological integration to be accompanied by public policies that ensure equitable access, adequate infrastructure, and ongoing teacher education - fundamental elements for promoting inclusive education aligned with the challenges of human and social development.

Keywords: Technology. Meaningful learning. Educational equity.

INTRODUCTION

Contemporary society is marked by the restructuring of social, cultural, and economic relations, driven by rapid technological development and the consolidation of the network society, or digital society. In this context, the relationship among Science, Technology, Education, and Society (STS) transcends a mere academic subject and becomes a fundamental paradigm for understanding and coordinating discussions about educational innovation. As technology permeates everyday life, the educational system must incorporate it with clear and consistent pedagogical purposes and intentions in order to educate individuals who are competent and, above all, critical thinkers (Moran, 2012; Tedesco, 2004).

The social relevance of this topic lies in the urgent need for schools to align with the demands of the twenty-first century, preparing students not only to use digital tools instrumentally but also to develop critical awareness of their ethical, political, and economic implications. From a scientific standpoint, the study is justified by the need to connect and integrate concepts that, although interrelated, are frequently addressed in isolation: the benefits of Multimedia Resources (Santos & Santana-Menezes, 2022), the systematization of Instructional Design (ID) (Caiado et al., 2024), the foundations of Neuroscience applied to cognition (Gonçalves & Nogueira, 2015), and the Curricular Integration of technologies.

The STS perspective is the theoretical pillar guiding this investigation because it establishes that science and technology are social products and therefore are not neutral. From this standpoint, education is understood as a strategic space for developing the capacity to intervene in reality, countering technological determinism and the belief that technology alone will solve pedagogical problems.

On the contrary, the focus is on the teacher's pedagogical intentionality, with the teacher viewed as the principal agent in mediating knowledge. The research problem therefore consists of investigating the factors that limit or enhance this mediation, particularly unequal access and teacher education. The absence of public policies ensuring equitable access to technological infrastructure may widen social disparities, making the pursuit of digital inclusion an ethical and educational imperative.

Accordingly, this study aimed to analyze, in depth and in an integrated manner, the relationships among science, technology, education, and society; identify the impacts of technological integration - in its multimedia, instructional, and neurocognitive dimensions - on learning; and critically discuss the structural challenges and essential contributions to the contemporary educational landscape.

METHODOLOGY

The methodology used in this study was qualitative and based on a literature review design. This approach was selected because of the need to conduct a critical and integrated analysis of information and data already published in a documentary corpus relevant to the topic. The research universe consisted of academic publications and contemporary literature addressing the pedagogical use of digital technologies, their relationship with learning, Instructional Design, Neuroscience applied to Education, and the STS perspective.

The analytical corpus used for the theoretical foundation and discussion of the results was structured around four areas of thematic inquiry developed by the author in previous studies. These areas - Benefits of Multimedia, Instructional Design Using Technology, Neuroscience, Education and Technology, and Technologies Integrated into the Classroom - served as the primary analytical categories. They were complemented by secondary sources that provided theoretical and conceptual

support (Allan, 2015; Brito & Purificação, 2012; Castro & Mill, 2018; Moran, 2012; Tedesco, 2004).

The inclusion criteria encompassed publications that discuss the intentional and pedagogical use of technologies, their relationship with learning, teacher education, and the social implications for educational practice, in alignment with the STS perspective. Texts with a strictly technical or commercial focus and no connection to educational purposes were excluded. The analytical process consisted of an exploratory and systematic reading of the concepts and evidence presented in the primary studies, followed by thematic categorization and organization. The data were subsequently connected and compared with the STS theoretical framework to develop the theoretical foundation and expanded results.

Regarding ethical considerations, because this study was exclusively bibliographic and did not involve the direct or indirect collection of data from human participants or the use of private information, it was conducted in accordance with academic integrity guidelines and did not require submission to a Research Ethics Committee, as provided by Resolution No. 510/2016 of the Brazilian National Health Council.

PRESENTATION AND DISCUSSION OF RESULTS

The analysis of the studies and theoretical framework identified four essential areas of convergence for understanding educational innovation. The discussion of the results is based on the articulation of these areas, always through the lens of Science-Technology-Society (STS), which serves as both a catalyst and an ethical standard for technological applications.

The Multivector Structure of Meaningful Learning with Technology

The effectiveness of technological integration in education does not lie in the device itself, but in the synergistic combination of cognitive and pedagogical factors. The results showed that the planned use of technology promotes meaningful learning by stimulating the brain in ways that traditional methods do not achieve and by structuring instruction in an adaptable manner.

Table 1 summarizes the interconnection among the theoretical foundations analyzed and their direct contributions to the development of a teaching-learning methodology aligned with the digital age.

THEORETICAL FOUNDATION	CONTRIBUTION TO TEACHING AND LEARNING	RELATIONSHIP TO TECHNOLOGY
Multimedia Resources	Dynamism, attractiveness, flexibility, and accessibility.	A combination of sensory stimuli (visual and auditory) that engages attention and memory.
Instructional Design (ID)	Coherence, systematization, personalization, and alignment of the learning pathway.	Digital platforms and software are used to track progress and adapt content to each learner's pace.
Cognitive Neuroscience	Enhancement of synapses, attention, motivation, and memory consolidation.	Interactive tools (VR and gamification) stimulate neurotransmitter release (dopamine) and facilitate cognitive organization.
STS Perspective	Critical awareness, equity, and opposition to technological determinism.	Ethical and political guidance for using technology to promote social inclusion and civic education.

Source: Prepared by the author (2026), based on Santos and Santana-Menezes (2022), Caiado et al. (2024), Gonçalves and Nogueira (2015), and Moreira (2020).

The analysis of Table 1 demonstrates that the success of a technological intervention depends on integrating all of its columns. The dynamism of Multimedia Resources (Santos & Santana-Menezes, 2022) is fundamental to engagement, but their application must be systematically planned through Instructional Design (Caiado et al., 2024), which ensures that objectives remain coherent. This coherence, in turn, should draw on findings from Neuroscience, which confirms the value of interactive activities for neurotransmitter release and the strengthening of long-term memory (Gonçalves & Nogueira, 2015).

The contribution of technology to neurocognition is widely emphasized, as interactive tools such as Padlet in collaborative contexts intensify the exchange of ideas (Klein & Vosgerau, 2018) and facilitate the formation of new neural connections. This scientific foundation equips teachers to move beyond the role of mere transmitters and instead organize learning situations with intentionality, coherence, and a focus on evidence.

In addition, contemporary literature emphasizes that the use of technology must be connected to the development of intellectual autonomy and the active construction of meaning. From this perspective, Moreira (2020) provides a meaningful synthesis of the role of technologies in meaningful learning, as presented in the following quotation:

The use of educational technologies must be understood not as an isolated resource, but as an element within an interconnected system of pedagogical relationships. When critically integrated into planning, technology contributes to cognitive reorganization, expands the learner's capacity to construct meaning, and enables prior knowledge to interact with new information. This process goes beyond instrumental use and becomes a formative practice sustained by interactions, reflections, and experiences that continue over time. (Moreira, 2020, p. 47)

This conception reinforces that technology does not operate autonomously; it depends on careful pedagogical mediation and a methodological structure capable of guiding meaningful experiences. Virtual environments, simulators, and multimodal resources expand opportunities for experimentation, stimulate critical thinking, and create conditions for students to develop their own strategies for investigation and problem-solving. In this context, instructional design connects objectives, content, and digital resources, creating inclusive and dynamic learning pathways aligned with the demands of contemporary society.

Student agency, personalization, and the sociopedagogical dimension

When properly implemented, technology has profound effects on the sociopedagogical dimension, particularly by strengthening student autonomy and agency. Students, who belong to a generation deeply immersed in digital culture, find in multimedia resources fertile ground for actively constructing knowledge. Rather than remaining passive recipients, they develop investigative, creative, and collaborative competencies, assuming greater intellectual independence (Moran, 2012). This change shifts the focus of the educational process and places students at the center, allowing their experiences, curiosity, and learning pace to guide pedagogical work.

Although technology provides the means for this transformation, it does not operate in isolation. Instructional Design is essential for structuring flexible, coherent, and intentionally planned learning pathways. Models such as blended learning increase the capacity to personalize activities, explore multiple forms of expression, and create more meaningful experiences, especially when combined with collaborative and problem-posing practices (Castro & Mill, 2018).

Thus, personalization becomes an element that goes beyond the technical dimension and serves as a guiding principle for instruction that is more inclusive and responsive to individual differences.

The STS perspective reinforces this need by recognizing that the integration of science,

technology, and society requires consideration of the cultural, ethical, and political dimensions that shape education. From this perspective, personalizing instruction means more than adjusting a learning pathway; it means recognizing each student's uniqueness, context, history, and actual opportunities for participation. Personalization therefore functions as a strategy for mitigating inequality, expanding access, promoting equity, and strengthening the emancipatory potential of schools.

Specialized literature emphasizes that this process requires careful attention to diversity and to the material conditions that influence learning. The use of digital platforms, adaptive pathways, and collaborative environments, for example, allows students to progress at different paces, explore additional content, and revisit concepts whenever necessary. This expands instructional time and shifts the focus from lectures to an interactive dynamic in which teachers monitor individual pathways and mediate learning needs more precisely.

This conception is supported by studies that discuss personalization from a comprehensive perspective. Bacich and Moran (2018) summarize this understanding in the following quotation, which illustrates the breadth and social commitment involved in the process:

Personalization does not mean individualizing instruction in isolation or fragmenting the educational experience. It occurs when teachers create conditions for each student to progress at their own pace, using different forms of expression, digital resources, and collaborative practices. In this process, technology does not replace the educator; on the contrary, it expands the educator's capacity to monitor, guide, and offer appropriate challenges, making learning fairer, more meaningful, and more accessible. (Bacich & Moran, 2018, p. 63)

This approach reinforces that student agency does not emerge spontaneously; it requires a pedagogical environment that encourages decision-making, self-management, and the collective construction of solutions. Autonomy develops as students understand their learning objectives, identify their difficulties, seek strategies to overcome them, and establish critical relationships with knowledge. In this process, technology contributes by providing tools that expand opportunities for investigation, experimentation, and original production.

Virtual learning environments, simulators, creation applications, collaborative platforms, and automated feedback systems help students assume greater responsibility for their learning pathways. At the same time, they strengthen social-emotional competencies such as cooperation, organization, persistence, and communication, which are essential to comprehensive development. The sociopedagogical nature of this movement becomes evident when these practices promote active participation, foster a sense of belonging to the school community, and expand dialogue among peers.

From the teacher's perspective, this context requires new forms of pedagogical intervention. The teacher assumes the roles of mediator, content curator, experience designer, and facilitator of reflective processes. Rather than centralizing knowledge, the teacher creates conditions for learning to occur in multiple spaces, at different times, and through various formats. This reorganization does not diminish the educator's role; on the contrary, it values that role and reinforces the need for conscious, well-founded planning that is responsive to the demands of the digital age.

Thus, student agency and personalization constitute an integrated movement that redefines the school environment, promotes dialogic practices, and guides teaching toward a more equitable and inclusive perspective connected to contemporary realities. When applied with pedagogical intentionality, technology becomes an axis of transformation that expands opportunities and strengthens the social role of education.

The STS perspective and addressing structural and equity challenges

The principal conclusion of the analysis, viewed through the STS perspective, is that the effectiveness of technological innovation is constrained by structural challenges that perpetuate digital exclusion and unequal opportunities. Although contemporary discourse values the transformative potential of educational technologies, their implementation remains conditioned by political, economic, and institutional factors that often extend beyond the individual teacher's sphere of action. In this sense, it is clear that democratizing access to technologies involves more than making them available; it requires a critical understanding of the social mechanisms that produce and sustain inequalities.

Table 2 describes the main challenges identified and the strategies required to overcome them, following guidance derived from a critical educational policy grounded in equity, social justice, and inclusion.

IDENTIFIED STRUCTURAL CHALLENGE	SOCIAL IMPLICATION (STS PERSPECTIVE)	REQUIRED STRATEGY
Low Quality of and Access to Infrastructure	Widening social disparities and digital exclusion, penalizing students from low socioeconomic backgrounds.	Develop public policies for major investment in high-quality broadband, equipment, and maintenance throughout the school system.
Insufficient Teacher Education	Superficial use or rejection of technology, resulting in a failure to redefine methodology.	Provide continuous and permanent education that goes beyond technical operation and focuses on pedagogical intentionality and ID.
Curricular and Structural Resistance	Risk of replacing a traditional method without changing the essence of teaching - substitution without transformation.	Redefine teacher identity and the curriculum, transforming teachers into mediators and the curriculum into a means of accessing technology and high-quality knowledge (Rocha, 2009).

Source: Prepared by the author (2026), based on Júnior (2018) and Rocha (2009)

As shown in Table 2, the central challenge is no longer the acceptance of technology, but the equitable management of its use. Expanding the availability of devices and digital resources does not by itself overcome educational inequality, particularly when structural factors such as income, location, infrastructure availability, and teacher education determine who can fully benefit from these resources. Thus, the discussion shifts from technical access to an analysis of the actual conditions of use, participation, and continuity, which are essential elements of the STS perspective.

As an agent of change, the teacher needs solid and ongoing education to master the full range of possibilities offered by digital technologies (Júnior, 2018). In many contexts, however, teacher education remains limited to technical training and does not address the pedagogical, ethical, and political dimensions of technological integration. For the STS approach, this limitation reveals a structural problem: the absence of professional-development policies that recognize teachers as critical agents capable of transforming traditional practices and promoting more democratic learning.

In addition, curricular and institutional resistance continues to represent a significant barrier to innovation. Many schools reproduce rigid, inflexible models disconnected from contemporary demands, restricting the potential of technologies to practices of substitution rather than transformation. In this regard, Rocha (2009) emphasizes the importance of breaking with rigid

structures and understanding the curriculum as a dynamic, cultural, and political space. This perspective can be observed in the following quotation:

Curricular transformation cannot be reduced to simply adding technologies to everyday school life. It entails reinterpreting teachers' professional identity and understanding the curriculum as a social construction and a space for access to high-quality knowledge. Digital resources must be guided by democratic practices that question inequalities, promote active participation, and expand educational horizons. Without this substantive change, any innovation remains superficial and restricted to a select few. (Rocha, 2009, p. 112)

This reflection shows that technological innovation, when not accompanied by profound structural changes, tends to reinforce inequalities rather than overcome them. For this reason, the STS perspective calls for a broader understanding of educational policies, recognizing that technology fulfills its democratizing role only when connected to three fundamental dimensions: adequate infrastructure, qualified teacher education, and critical pedagogical intentionality. Without this three-part foundation - infrastructure, education, and intentionality - the transformative potential of technology risks becoming a privilege limited to well-resourced urban schools, thereby deepening historical disparities.

Under these conditions, innovation operates more as a mechanism of social distinction than as an instrument of inclusion. Ensuring infrastructure is not limited to providing equipment; it also involves ongoing maintenance, stable connectivity, technical support, and territorial expansion policies that include schools in rural, riverside, or vulnerable communities.

Likewise, teacher education must be ongoing, reflective, and context-specific, enabling teachers to recognize technology as a tool for mediation, expression, and social construction rather than as a merely technical resource. Such education makes it possible to plan more conscious and ethical pedagogical interventions committed to meaningful learning.

Finally, pedagogical intentionality ensures that technology is integrated into the curriculum in alignment with broad educational objectives, valuing critical thinking, participation, inclusion, and social justice. Only when these elements are coordinated does technology cease to be a privilege and become effective public policy capable of democratizing knowledge and strengthening educational practices guided by the STS perspective.

CONCLUSION

This study achieved its proposed objective by analyzing the implications of technological innovations for the teaching-learning process from the Science, Technology, and Society (STS) perspective. The analysis showed that technologies can foster more meaningful, participatory, and contextualized learning when used in a planned manner and connected to pedagogical foundations, including contributions from Instructional Design and Neuroscience.

Technology, however, does not in itself constitute a solution to educational challenges. From the STS perspective, its use is related to social, cultural, economic, and political factors and may contribute either to the democratization of knowledge or to the reproduction of inequalities. In this context, teacher mediation is fundamental to ensuring the critical, ethical, and inclusive use of technological resources.

The study concludes that technological innovation can contribute to the transformation of education when connected to intentional pedagogical practices and public policies committed to equity, inclusion, and teacher education. Empirical research in different educational contexts is recommended to deepen understanding of the effects of these innovations on learning and social transformation.

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iJERResearch

International Journal of Education and Research

Vol. 1, Number 2, September - 2026 | Peer-Reviewed Journal

ISSN 2764-9733 | ijerresearch.org

DOI: 10.5281/zenodo.23062217

THE MENTAL HEALTH OF EARLY CHILDHOOD EDUCATION TEACHERS: PSYCHOLOGICAL DISTRESS, WORKING CONDITIONS, AND INSTITUTIONAL POLICIES

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ABSTRACT

This article analyzes the mental health of Early Childhood Education teachers from a critical, broad, and intersectoral perspective. Drawing on authors such as Ferreira, Freud, Campos, and Viegas, as well as the DSM-5-TR, it examines teachers' psychological distress not as an individual pathology, but as a legitimate expression of the structural and institutional tensions that permeate pedagogical work. This qualitative literature review identified three central categories: a broad conception of mental health; working conditions as factors contributing to illness; and the inadequacy of public care policies. The findings showed that teachers' psychological distress is associated with work intensification, emotional overload, loss of autonomy, and the absence of permanent institutional spaces for listening and support. The study also highlights the precarious nature of government policies addressing teachers' emotional health, which are characterized by isolated, informational, and nonpreventive initiatives. It concludes that ensuring educators' mental health is a collective responsibility, requires integrated and continuous policies, and is indispensable to the quality of public education. Caring for teachers means caring for education.

Keywords: Mental Health. Early Childhood Education. Psychological Distress. Teaching Work. Public Policies.

INTRODUCTION

Mental health has become a central issue in discussions about the well-being of education professionals, particularly in the context of public Early Childhood Education. This stage requires teachers to possess not only cognitive skills, but also an intense affective and physical commitment, making them particularly vulnerable to adverse conditions in the school environment. The COVID-19 pandemic further exposed these professionals' emotional vulnerabilities, underscoring the urgent need to understand and promote mental health in educational settings.

According to the World Health Organization (WHO, 2022), mental health is a state of well-being in which individuals recognize their abilities, cope with the normal stresses of life, work productively, and contribute to their communities. However, this broad definition faces challenges in everyday school life, where teachers frequently encounter exhausting work schedules, a lack of institutional support, and multiple emotional demands.

As early as 1930, Freud (2021 [1930]) warned that psychological suffering is an unavoidable part of social life, especially when the demands of work and culture conflict with individual desires and needs. Complementing this perspective, Ferreira (2021) distinguishes psychological distress from mental illness, emphasizing that the former is a natural and legitimate response to adverse conditions, whereas the latter indicates more severe impairment of emotional health.

This article aims to analyze the definition and importance of mental health in educational settings, especially with regard to teachers in public Early Childhood Education. It seeks to understand the effects of working conditions on these professionals' mental health and to discuss the need for institutional policies that promote teacher care and well-being.

METHODOLOGY

This study is characterized as qualitative, bibliographic, and exploratory research that seeks to understand and analyze conceptions of and impacts on mental health in the context of teachers working in public Early Childhood Education. The choice of a qualitative approach is justified by the need to investigate subjective, social, and institutional aspects related to these professionals' psychological distress and emotional health.

The research corpus consisted of secondary sources selected according to criteria of thematic relevance, currency, and contribution to understanding the object of study. Books, scientific articles, official World Health Organization documents (WHO, 2022), and classic works such as Freud (2021 [1930]) were analyzed. The time frame encompassed publications from 2021 to 2024, ensuring that the discussion remained current.

The sources were selected from recognized academic databases, including SciELO, Google Scholar, and institutional repositories, using keywords related to mental health, psychological distress, early childhood education, teaching work, and public policies. Sources that were strictly clinical or focused exclusively on individual treatments were excluded in order to prioritize a sociopsychological and institutional perspective.

Content Analysis based on Farias Filho and Arruda Filho (2013) was used to analyze the bibliographic data. This methodology enabled an in-depth understanding of the multiple dimensions of mental health in the school environment by connecting the subjective aspects of psychological distress with the structural conditions of teaching work and institutional responses.

PRESENTATION AND DISCUSSION OF RESULTS

The analysis of the selected bibliographic material identified three central categories for addressing the mental health of Early Childhood Education teachers: (1) a broad conception of mental health; (2) working conditions and teachers' psychological distress; and (3) the inadequacy of institutional policies for care and emotional support.

A broad conception of mental health

The World Health Organization (WHO, 2022) defines mental health as a state of well-being that extends beyond the mere absence of mental disorders and encompasses an individual's ability to recognize their own potential, cope with the stresses of everyday life, carry out activities productively, and participate in community life. This conception expands the traditional understanding of mental health, which is often associated with the presence or absence of illness, by recognizing that psychological well-being is also related to the social, relational, and environmental conditions in which an individual lives.

From this perspective, mental health should be understood as a multidimensional phenomenon involving emotional, cognitive, social, and relational aspects. It is therefore not a permanent state of happiness or an absence of conflict, but a condition that enables individuals to develop resources for coping with different life situations and to maintain their participation in personal, social, and professional activities (WHO, 2022). This understanding is especially important when analyzing workers' mental health because the work environment and working conditions are significant dimensions of everyday life.

Ferreira (2021) complements this understanding by emphasizing that mental health involves emotional and cognitive balance, allowing individuals to recognize their own abilities and face the challenges encountered throughout their lives. This balance, however, does not mean the absence of difficulties, conflicts, or negative emotions. Suffering is part of the human experience and may arise in response to adverse situations, changes, losses, interpersonal conflicts, or circumstances that, at a particular moment, exceed the resources available for coping. It is therefore necessary to distinguish experiences of psychological distress from the existence of a mental disorder itself (Ferreira, 2021).

This distinction is essential because not every manifestation of emotional distress constitutes an illness or mental disorder. Feelings such as sadness, fear, worry, anxiety, and stress may be part of normal human responses to difficult events. Clinical understanding requires consideration of the intensity and persistence of these manifestations, as well as their effects on an individual's functioning and on the different contexts in which that person lives (APA, 2022).

In this regard, the DSM-5-TR - Diagnostic and Statistical Manual of Mental Disorders, Text Revision - helps distinguish expected emotional manifestations from conditions that may constitute mental disorders. The manual establishes specific diagnostic criteria and considers, among other factors, the presence of clinically significant distress or impairment in social, occupational, or other important areas of functioning (APA, 2022). Thus, identifying isolated symptoms is not sufficient to characterize a mental disorder; a professional evaluation considering the full set of manifestations is required.

Considering context is also essential to understanding experiences related to mental health. Individuals do not experience emotions in isolation, but in constant interaction with their social, family, professional, and cultural realities. Accordingly, conflict, overload, instability, relational difficulties, or adverse conditions may affect psychological well-being, although it is not appropriate to establish an automatic causal relationship between a particular external condition and the

development of a mental disorder (WHO, 2022; APA, 2022).

This understanding becomes particularly relevant when examining the professional context of teaching. A teacher's work involves various dimensions beyond the performance of pedagogical activities. Teachers maintain ongoing relationships with children, families, colleagues, and administrators; plan instruction; monitor learning processes; manage conflict situations; and respond to institutional and social demands. In Early Childhood Education, these demands are also associated with the specific characteristics of working with young children, which simultaneously involves education, care, supervision, and relationship building.

Thus, the concrete conditions under which work is performed may contribute to teachers' experiences of well-being or distress. Activity overload, institutional demands, structural difficulties, conflict in professional relationships, insufficient resources, lack of recognition, and pressure to meet multiple demands may create tension in everyday professional life. This does not mean that these factors, in isolation, cause mental illness, but it does recognize that working conditions form part of the context in which experiences of health, distress, and illness may develop (WHO, 2022; Ferreira, 2021).

Along these lines, Ferreira (2021) emphasizes the importance of considering social and institutional aspects when seeking to understand mental health. Psychological distress should not be analyzed exclusively as an individual difficulty because it may be related to an individual's experiences in different spheres of participation. In the professional context, this perspective makes it possible to understand that caring for workers' mental health cannot be reduced to the individual responsibility of developing strategies to endure pressure or adversity.

It is therefore important to distinguish among mental health, psychological distress, and mental disorder. Mental health refers to a broad condition of well-being and capacity to function; psychological distress concerns experiences of emotional pain, discomfort, anguish, or difficulty coping that may occur at different moments in life; and a mental disorder corresponds to a clinical condition that must be identified through assessment and specific diagnostic criteria (WHO, 2022; Ferreira, 2021; APA, 2022).

This distinction is especially important in studies investigating teachers' health because reports of anxiety, stress, sadness, sleep disturbances, feelings of exhaustion, or psychosomatic manifestations are not, by themselves, sufficient to establish the existence of a mental disorder. Such manifestations must be understood by considering their frequency, intensity, duration, context, and possible effects on the individual's personal and professional life (APA, 2022).

At the same time, recognizing that particular distress does not necessarily correspond to a clinical diagnosis does not mean minimizing its importance. Psychological distress may compromise quality of life, interpersonal relationships, professional performance, and perceived well-being, and may indicate a need for compassionate reception, listening, and support. Care initiatives therefore need not depend on the existence of a diagnosis, because promoting mental health also involves prevention, support, and improvements in living and working conditions (WHO, 2022; Ferreira, 2021).

This approach also makes it possible to question excessively individualizing perspectives on teachers' distress. Although personal coping resources are important, they do not replace the responsibility of institutions and public policies to create conditions favorable to mental health. Promoting mental health at work requires attention to professional relationships, the organization of activities, worker participation, material conditions, professional recognition, and the availability of institutional spaces for dialogue and support (WHO, 2022).

In educational settings, promoting mental health therefore means going beyond isolated measures directed at individual teachers. The organization of work and the conditions under which teaching is

performed must be considered. Creating professional environments that foster respectful relationships, communication, participation, recognition, and support can help establish conditions that are more conducive to the well-being of education workers (WHO, 2022; Ferreira, 2021).

Integrating the contributions of the World Health Organization, Ferreira, and the DSM-5-TR therefore makes it possible to understand mental health as a complex and multidimensional phenomenon. Mental health is not limited to the absence of disorders, just as psychological distress should not automatically be interpreted as mental illness. These concepts are related but distinct and must be analyzed by considering both individual characteristics and the social, relational, and institutional contexts in which people live (WHO, 2022; Ferreira, 2021; APA, 2022).

This understanding is fundamental to analyzing the mental health of Early Childhood Education teachers because teaching involves intense human interaction, educational responsibility, emotional demands, and institutional requirements. Considering these different dimensions enables a more careful analysis of professionals' experiences of distress and avoids both normalizing their suffering and immediately pathologizing it.

Thus, promoting teachers' mental health should be understood as a responsibility shared among individuals, institutions, and public policymakers. Care should not be provided only after distress has intensified or a diagnosis has been established; it should also be provided through preventive measures and the promotion of work environments that foster well-being. This perspective contributes to building healthier educational spaces and valuing the professionals responsible for educational work (WHO, 2022; Ferreira, 2021).

Working conditions and teachers' psychological distress

The working conditions of Early Childhood Education teachers, characterized by long hours, multiple responsibilities, limited professional recognition, and a lack of institutional support, contribute significantly to psychological distress. These factors frequently trigger anxiety, chronic stress, emotional exhaustion, and, in more severe cases, mental illness (Campos and Viegas, 2021).

In their investigation of mental health in teaching work, Campos and Viegas (2021) show that intensified activities, task overload, and limited pedagogical autonomy are structural factors that compromise teachers' subjectivity.

When teachers are deprived of the freedom, creativity, and sufficient planning time needed to practice their profession, the meaning of their work is disrupted. This loss of meaning in educational practice deepens feelings of frustration, powerlessness, and emotional strain, turning teaching into an often exhausting and dehumanizing experience, as described by Campos and Viegas (2021).

Ferreira (2021) proposes an essential distinction between psychological distress and mental illness, understanding the former as a subjective response, situated in context, to the objective conditions of professional practice. According to the author, psychological distress serves as a signal from the body and mind in response to situations perceived as threatening, disproportionate, or unsustainable, but which do not yet constitute a pathological clinical condition, as in the case of mental illness.

Distinguishing distress from pathology is fundamental to developing institutional strategies for care, prevention, and support, particularly in teaching, a profession marked by constant emotional and symbolic demands (Ferreira, 2021).

This interpretation aligns with the Freudian perspective presented in *Civilization and Its Discontents*, written in 1930, in which Freud (2021 [1930]) argues that suffering is inherent to the human condition, but intensifies when individual desires are continually repressed by social and

cultural demands. From this standpoint, work can be a source of either fulfillment or oppression, depending on the material and symbolic conditions that shape it.

When the contributions of Ferreira, Freud, Campos, and Viegas are considered together, they converge in their criticism of reductive and individualizing approaches to psychological distress. For these authors, distress is not a personal "defect," but an authentic response to the obstacles and contradictions present in labor relations and institutional models. Freud (2021 [1930]) denounces the repression of desires in the face of civilizational demands; Ferreira (2021) interprets distress as a necessary signal calling for the transformation of working conditions; and Campos and Viegas (2021) identify intensification, overload, and loss of autonomy as central sources of distress.

Teachers' psychological distress should therefore not be addressed solely at the individual level, but understood as an expression of institutional dysfunction that requires collective, political, and structural intervention, according to Campos and Viegas (2021) and Ferreira (2021). Promoting mental health among Early Childhood Education teachers necessarily involves valuing teaching work, expanding teachers' autonomy, recognizing the emotional conditions that permeate daily school life, and implementing integrated public policies for care and support (Campos and Viegas, 2021; Ferreira, 2021).

Loss and Lyra (2023) emphasize that teaching is considered one of the most stressful professions in the world, alongside health care and public safety, because of work overload, low salaries, inadequate infrastructure, and interpersonal problems in the school environment. These factors make emotional management a constant demand for teachers and negatively affect their mental health.

According to Loss and Lyra (2023), the longstanding lack of qualified education in emotional matters and of policies encouraging attention to teachers' mental health impedes the development of self-care and emotional intelligence, thereby entrenching teachers' psychological distress.

The inadequacy of institutional policies for care and emotional support

The literature analysis indicates that, although psychological distress among Early Childhood Education teachers is widely recognized, institutional policies for promoting mental health remain rudimentary, fragmented, and often inadequate to address the complexity of school realities. Isolated initiatives, generally based on palliative or emergency measures, do not provide a structured response to the emotional needs of education professionals (Loss and Lyra, 2023).

Campos and Viegas (2021) emphasize that the absence of permanent strategies for support and prevention aggravates emotional vulnerability while relieving government authorities and educational institutions of responsibility for creating a genuinely healthy work environment.

Rendering teachers' psychological distress invisible contributes to the normalization of illness by treating emotional strain as inherent to the profession rather than recognizing it as a direct consequence of precarious conditions, work intensification, and insufficient institutional support (Campos and Viegas, 2021).

To a large extent, this omission reflects a managerial and productivity-oriented logic in educational policies, in which measurable performance - such as targets, indicators, and external assessments - takes precedence over care for the person who teaches. From this perspective, teachers' distress is silenced, depoliticized, and individualized, as though it resulted from personal weaknesses rather than structural factors permeating everyday school life (Campos and Viegas, 2021).

Both Campos and Viegas (2021) and Loss and Lyra (2023) indicate that the absence of integrated policies demonstrates the urgent need to rethink the role of educational institutions in promoting mental health as a right of education workers. This entails investing in continuous programs of

qualified listening, providing permanent spaces for professional learning and reflection on pedagogical practice, guaranteeing time for collective planning, and fostering mutual-care practices in everyday school life.

In this context, promoting mental health in teaching work should be understood as a collective and intersectoral responsibility connecting education, health, and social assistance, particularly in Early Childhood Education. Recognizing the centrality of emotional health in educational practice is a fundamental step toward transforming working conditions and ensuring the retention and well-being of education professionals (Loss and Lyra, 2023).

Loss and Lyra (2023) state that Brazil has no effective government public policies specifically directed toward teachers' emotional care. The few existing initiatives are predominantly informational or palliative, focusing on general guidance without a structure for preventive and continuous action. There is a structural gap in the provision of permanent programs for listening, emotional management, and psychological support within school systems.

Deficiencies in initial and continuing education concerning emotional well-being also compromise teachers' ability to recognize, name, and manage their own emotional states, directly affecting interpersonal relationships, the quality of pedagogical interactions, and the school environment as a whole. This educational gap underscores the urgent need for public policies that institutionalize emotional education as an inseparable dimension of teacher preparation and professional recognition (Loss and Lyra, 2023).

As an alternative, the authors cited above propose adopting self-education and preventive practices, such as reflective narratives and sensitive listening, institutionalized within school systems as permanent strategies for strengthening teacher well-being and collectively addressing distress.

These proposals should be coordinated with existing legal guidelines, such as Federal Law No. 14,819/2024, which establishes the National Psychosocial Care Policy in School Communities and seeks to promote the mental health of students, teachers, and other members of the school community. This legislation represents progress by recognizing that the school environment must also be a space for care and emotional protection. For teachers in particular, the law proposes a sensitive approach to working conditions and the emotional demands arising from teaching (Brazil, 2024).

The law provides for integrated and intersectoral measures to promote, prevent, and provide mental health care, to be developed collaboratively among the fields of education, health, and social assistance. In this regard, institutional conditions must be ensured for welcoming educators and providing them with psychological follow-up, while respecting their individual circumstances and offering support in response to factors contributing to psychological distress, such as work overload, precarious employment conditions, and the profession's multiple demands.

In addition, the policy calls for continuing education for education professionals focused on mental health and well-being, enabling teachers to become active agents in building a culture of care in the school environment. Thus, Law No. 14,819/2024 not only recognizes teachers' psychological distress but also establishes concrete guidelines for implementing strategies to address it, thereby contributing to professional recognition and improved working and teaching-learning conditions (Brazil, 2024).

Promoting teachers' mental health is not an institutional concession, but an ethical, pedagogical, and fundamental requirement. It means ensuring humane working conditions and fulfilling the right to quality education. As long as mental health continues to be treated as an individual issue, projects for inclusive, human-centered, and transformative education will remain compromised (Loss and Lyra, 2023).

CONCLUSION

This article sought to analyze the mental health of Early Childhood Education teachers from a broad, critical, and interdisciplinary perspective. Based on the specialized literature, it was possible to identify that teachers' psychological distress does not arise exclusively from individual vulnerabilities, but is directly related to objective working conditions, task intensification, emotional overload, and the absence of structured institutional care policies.

By connecting the authors' contributions with current legislation, the study found that psychological distress should be recognized as a legitimate, context-dependent phenomenon that reveals the institutional contradictions permeating teaching practice. This understanding moves beyond a pathologizing and individualizing logic and proposes that mental health care be treated as a collective, political, and pedagogical issue.

The study also found that public policies promoting teachers' emotional health are still incipient, uncoordinated, and predominantly palliative. Institutional neglect of teachers' psychological distress contributes to its normalization and perpetuation, especially in Early Childhood Education, a stage that requires intense affective and emotional engagement from educators. The absence of education concerning emotional well-being, combined with the lack of permanent programs for listening, compassionate reception, and psychological support, compromises not only professionals' well-being but also the quality of pedagogical relationships and the school environment as a whole.

Promoting teachers' mental health should therefore be understood as a permanent ethical and intersectoral responsibility requiring public investment, a review of working conditions, and the reorganization of institutional practices. Educational policies must connect professional recognition with the creation of school cultures that acknowledge vulnerability as part of the human condition rather than as a sign of weakness or individual deviance.

Ensuring the mental health of Early Childhood Education teachers also means guaranteeing the right to education characterized by quality, care, meaning, and dignity. It means recognizing that human-centered education is not possible when educators become ill while practicing their profession.

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iJERResearch

International Journal of Education and Research

Vol. 1, Number 2, September - 2026 | Peer-Reviewed Journal

ISSN 2764-9733 | ijerresearch.org

DOI: 10.5281/zenodo.23062322

PHILOSOPHICAL, HISTORICAL, SOCIAL, AND CULTURAL FOUNDATIONS OF EDUCATION: INFLUENCES ON THE DEVELOPMENT OF CONTEMPORARY PEDAGOGICAL PRACTICES

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ABSTRACT

This article analyzes how the philosophical, historical, social, and cultural foundations of education influence the development of contemporary pedagogical practices. The investigation was conducted through a narrative literature review using a qualitative and interpretive approach. The corpus comprised scientific articles and institutional documents published in Portuguese between 2022 and 2025, selected for their thematic relevance and full-text availability from academic or official sources. The results show that pedagogical practice is not a neutral application of techniques, because it expresses conceptions of human beings, knowledge, society, culture, and justice. The historical dimension makes it possible to recognize continuities and disputes within school organization. The social dimension reveals how economic, racial, and territorial inequalities permeate the conditions of teaching and learning. The cultural dimension highlights the need for dialogic and intercultural curricula. The study concludes that integrating these foundations supports more conscious, contextualized, and democratic teaching decisions, from planning through assessment, and provides criteria for distinguishing pedagogical innovation from the mere adoption of resources or methodologies.

Keywords: Philosophy of Education. History of Education. Educational Inequalities. Culture. Pedagogical Practices.

INTRODUCTION

Contemporary education takes place in a reality marked by technological change, cultural plurality, the rapid circulation of information, and persistent inequalities. In this context, teaching now deals simultaneously with new forms of language, different modes of participation, and longstanding disparities in access to knowledge. Schools remain responsible for intellectual, ethical, and social development, but face pressure for immediate results, curricular standardization, and the constant adoption of new trends. Luppi, Behrens, and Prigol (2022) show that overcoming the fragmentation of knowledge requires practices that value collaboration, interdisciplinarity, and reflection on the act of knowing itself. This perspective shifts the debate away from the isolated choice of methods and toward an understanding of the assumptions that guide educational action.

Pedagogical practice is frequently presented as a set of procedures intended to organize content, activities, and assessments. This description is insufficient because every teaching decision contains a conception of human development. When selecting content, defining a form of participation, or establishing assessment criteria, teachers assign value to particular forms of knowledge and ways of learning. Velasco (2022) notes that the philosophy of education examines educational purposes, while the fields of teaching inquire into learners, content, and methodologies. Bringing these levels together makes it possible to understand that "how to teach" cannot be separated from "why to teach" and "whom to teach."

The historical dimension broadens this analysis because school institutions, curricula, and professional identities were formed through long-term processes. Bencostta (2023) emphasizes that the history of education reveals regional experiences, disputes over memory, and forms of subordination that remain largely invisible in general narratives. Historical knowledge prevents school routines from being treated as natural or inevitable. Grade-level organization, the centrality of oral exposition, the allocation of time, the disciplining of bodies, and the hierarchy among forms of knowledge result from accumulated choices and can be examined critically. Understanding their origins does not mean rejecting all tradition, but recognizing the socially constructed nature of schooling.

The social and cultural dimensions also prevent an abstract interpretation of the educational process. Lima (2024) distinguishes among established rights, enacted rights, and rights actually exercised, showing that formal guarantees do not ensure their everyday realization. Candau and Ivenicki (2024) add that cultural differences, identities, and power relations must be incorporated into educational research and practice. Thus, a pedagogical proposal may be formally open to everyone while still producing silences, unequal expectations, or barriers to participation. The challenge is to connect universal principles of rights with careful attention to individuals' actual circumstances and experiences.

The rationale for this study derives from the need to bring these four dimensions together within a common interpretation. In some educational literature, philosophical foundations, the history of education, sociology, and cultural studies appear as separate components of teacher education. In schools, however, their effects are combined. An assessment based solely on reproducing information expresses a conception of knowledge, perpetuates a school tradition, distributes opportunities for success, and favors particular cultural repertoires. Silva Junior (2023) argues that the educational experience is dialogic and transformative, requiring openness to interpretation and encounters with others. This contribution reinforces the relevance of foundations capable of guiding concrete choices.

Against this background, the following research question was defined: How do the philosophical, historical, social, and cultural foundations of education influence the development of more conscious, contextualized, and democratic contemporary pedagogical practices? The question does not assume

that theory automatically determines teachers' actions. Instead, it seeks to identify mediations among educational ideas, historical processes, social structures, cultural repertoires, and instructional decisions. Fiorese and Trevisol (2024) demonstrate that the very concept of pedagogical innovation is polysemous and can be reduced to the use of novelty or technology when formative criteria are absent. An analysis of educational foundations provides precisely the points of reference needed to evaluate the coherence and scope of practices.

The overall objective was to analyze the influence of the philosophical, historical, social, and cultural foundations of education on the development of contemporary pedagogical practices. The specific objectives were to understand conceptions of human development, knowledge, and dialogue in recent philosophical debate; identify historical continuities and social conditions that affect the organization of teaching; and discuss how cultural diversity, inequality, and innovation can be considered in planning, mediation, and learning assessment. Pedreira and Cruz (2024) indicate that teachers' educational trajectories and motivations influence how the philosophy of education is taught and understood, confirming the importance of relating education, professional experience, and practice.

METHODOLOGY

The study was conducted through a narrative literature review with a qualitative approach, exploratory objective, and interpretive orientation. This design was selected because the research problem required the integration of contributions from different fields and an understanding of the conceptual relationships between educational foundations and pedagogical practices. The study did not seek to measure the effects of a specific intervention or conduct an exhaustive bibliometric survey. Rather, it sought to construct an argumentative synthesis connecting the philosophy of education, history of education, social inequalities, interculturality, teacher education, and pedagogical innovation.

The searches were conducted in August 2026 in SciELO, institutional repositories, and official websites of public and educational organizations. Combinations of the descriptors "philosophy of education," "history of education," "social foundations of education," "educational inequalities," "interculturality," "teacher education," and "pedagogical practices" were used. Publications in Portuguese released from 2022 onward were included if their full text was accessible and they were directly related to at least one of the study areas. Duplicate texts, materials without identifiable authorship or dates, publications before 2022, and studies whose focus did not permit discussion of educational implications were excluded.

The final corpus comprised 18 references, including scientific articles, reports, and institutional documents. Reading occurred in three stages. First, titles, abstracts, and keywords were examined to confirm relevance. Second, the full texts were read and their objectives, central concepts, results, and implications for practice were recorded. Third, the evidence was organized into four thematic areas: meanings of education and knowledge; the historicity of the school form; inequality and the right to education; and cultural diversity and pedagogical innovation. This organization made it possible to compare convergences, tensions, and complementarities.

The analysis was conducted through thematic interpretation and critical synthesis. The publications were not treated as isolated pieces, but as situated responses to contemporary educational problems. Statistical and institutional documents were used to contextualize inequalities and policies, while the articles provided conceptual categories and research results. One acknowledged limitation is that a narrative review depends on the researcher's interpretive choices and does not cover all available publications. To mitigate this limitation, the period, language,

sources, selection criteria, and analytical areas were explicitly stated.

PRESENTATION AND DISCUSSION OF RESULTS

Pedagogical practice as a philosophical choice

The literature synthesis first showed that pedagogical practice always involves philosophical choices, even when they are not explicitly stated. Planning a lesson means determining what deserves to be known, how students will be recognized, and which relationships will be considered legitimate. Velasco (2022) helps distinguish the question of educational purposes from questions about content and methods, but also demonstrates that these levels intersect. A methodology centered solely on predetermined answers tends to associate knowledge with reproduction. An inquiry-based proposal assumes that learning includes formulating problems, presenting arguments, revising hypotheses, and constructing meaning with teacher mediation.

This result calls into question the idea of instructional neutrality. Techniques do not carry a single meaning; rather, they acquire meaning within a conception of education. A lecture can organize concepts needed for an investigation, just as a group activity can preserve passivity if students merely divide repetitive tasks. Silva Junior (2023) offers a more consistent criterion by emphasizing dialogue, interpretation, and transformation. The quality of a practice depends on how it broadens understanding, creates openness to others, and enables participants to reconstruct their horizons, not merely on the format selected by the teacher.

Human development therefore emerges as a process connecting reason, experience, ethics, and language. Hermann (2023) shows that values and feelings participate in moral action and can be developed through educational experience. This dimension has implications for controversial topics, school relationships, and assessment. Teachers must create conditions for positions to be justified and compared with knowledge without turning dialogue into an absence of standards. Listening and rigor are not opposites. Listening recognizes the student as an interlocutor, while rigor requires concepts, evidence, coherence, and responsibility for what is asserted.

Philosophical reflection also changes the understanding of teacher authority. From a transmissive perspective, authority may be confused with control over speech and obedience. From a dialogic perspective, it rests on a commitment to organize learning experiences, present knowledge, uphold standards, and assume responsibility for the conditions of the pedagogical encounter. Luppi, Behrens, and Prigol (2022) identify an emphasis on mediation, cooperation, and interdisciplinarity in educational processes. These elements do not diminish the teacher's role. On the contrary, they make it more complex because they require diagnosis, careful selection, monitoring, and an ability to intervene without replacing the student's intellectual activity.

Another finding was the need to overcome fragmentation without erasing the specific characteristics of different fields of knowledge. Interdisciplinarity does not consist of bringing topics together superficially, but of formulating problems that require different perspectives. In an activity on educational inequalities, for example, statistical data may be analyzed with mathematical tools, interpreted historically, and discussed in light of concepts of justice. Luppi, Behrens, and Prigol (2022) connect the reform of thought with awareness of errors and illusions in knowledge. This attitude supports practices in which conclusions remain open to evidence-based revision.

The analysis also revealed that educational objectives must appear clearly in planning. Broad expressions such as "developing critical citizens" become empty when they are not translated into observable actions. A coherent objective may call for comparing sources, constructing arguments, listening to divergent perspectives, and making justified decisions. Pedreira and Cruz (2024) show that teacher educators' trajectories and motivations influence the teaching of philosophy of education.

This suggests that planning should include moments of professional self-reflection in which teachers examine the sources of their choices and the experiences underpinning their expectations of students.

History as a tool for denaturalization

The second area of results showed that historical foundations serve as a tool for denaturalizing the school. Apparently technical routines bear the marks of social projects and specific historical periods. The rigid distribution of time, separation of knowledge into disciplines, predominance of individual assessments, and centrality of certain narratives are not universal responses. Bencostta (2023) demonstrates that expanding the subjects, regions, and sources included in the history of education changes what counts as a relevant educational experience. For teachers, understanding this historicity creates space to ask which routines continue to serve current objectives and which persist merely because of institutional habit.

Denaturalization does not lead to a simple opposition between tradition and novelty. Some traditional practices can perform important functions, such as systematizing concepts, preserving memory, and ensuring educational progression. Problems arise when they are applied without examining their purpose and context. Fiorese and Trevisol (2024) identify various criteria attributed to innovation, including agency, rupture, technology, research, and active methodologies. The authors conclude that not everything presented as innovative produces pedagogical change. History helps identify continuities hidden beneath new terminology and evaluate transformations according to what they actually change in teaching and learning relationships.

This interpretation is particularly relevant in the context of digital culture. Soares, Cardoso, and Mueller (2022) connect history instruction, identities, and virtual information culture, emphasizing the need for critical praxis. The availability of short videos, images, maps, and digitized documents expands classroom possibilities, but also facilitates fragmentation, decontextualization, and the circulation of falsehoods. Historically grounded practices guide students in investigating the origin, authorship, date, intent, silences, and reception of materials. Technology then serves analysis rather than determining the pace and depth of learning.

Historical foundations also affect the selection of content. Traditional curricula often present certain groups only when they come into contact with dominant institutions, thereby limiting their historical agency. Oliveira and Almeida (2023) show that intercultural practices addressing Indigenous peoples can reshape students' perceptions and challenge stereotypical representations. This work requires sources produced by Indigenous people, attention to the present day, and criticism of the idea of a single and unchanging culture. Curricular revision moves beyond merely adding topics and begins to question the perspective from which knowledge was organized.

At the instructional level, the history of education can be incorporated into continuing education through the analysis of school documents, professional accounts, textbooks from different periods, and changes in physical spaces. Such materials make it possible to connect institutional memory with current problems. Bencostta (2023) calls attention to the preservation of collections and the localized production of knowledge. A school that investigates its own history recognizes continuities, conflicts, community contributions, and documentary absences. This activity can strengthen belonging without producing a celebratory narrative, provided that it includes critical questions and multiple voices.

The results also indicate that historicity helps moderate hasty judgments about students and families. Participation difficulties, learning gaps, and conflicts do not emerge in a vacuum. They may reflect histories of exclusion, discontinuous policies, and accumulated distrust. Lima (2024) notes that rights as practiced depend on concrete conditions, not merely on their legal formulation. Understanding historical processes does not remove individuals' responsibility, but distributes the

analysis more fairly by recognizing the conditions that expand or restrict their possibilities for action.

Inequalities, rights, and learning expectations

The third area showed that social foundations must be integrated into the core of pedagogical planning. National data confirm that access, continuity, and learning are distributed unequally. IBGE (2022) demonstrates persistent differences by color or race, while Inep (2024) presents a broad and heterogeneous basic education system. Araújo, Malbouisson, and Souza (2024) show that childhood circumstances influence academic performance. These data do not replace a diagnosis of the class, but they prevent performance from being attributed exclusively to individual merit, talent, or interest.

Lima (2024) argues that meritocracy can undermine the democratic realization of the right to education when it turns unequal results into proof of merit. In practice, this occurs when schools provide everyone with the same amount of time, materials, and explanations, disregard different starting points, and interpret the outcome as a pure expression of effort. Equity-oriented pedagogy maintains common learning objectives while diversifying forms of mediation. Additional support, concept review, accessible materials, flexible time, and varied ways of demonstrating knowledge do not lower expectations. They create the conditions under which expectations become attainable for more students.

Ernica, Rodrigues, and Soares (2025) show that rising averages can coexist with increasing internal inequalities. This finding changes the interpretation of school results. A class may improve overall while students in vulnerable situations fall further behind their peers. Teachers therefore need to examine distribution, individual progress, and error patterns, not only the average. Simple diagnostic records can identify which skills have been consolidated and which groups need intervention. Assessment serves a formative function when it produces information for replanning rather than merely classifying students.

Teacher capacity and institutional conditions constitute another part of the problem. Costa and Brandão (2024) note that vulnerable contexts often combine inadequate preparation, more precarious employment arrangements, and difficulties retaining professionals. Expecting individual initiative to compensate indefinitely for these conditions produces overload and instability. High-quality practices depend on collaborative planning time, pedagogical coordination, access to materials, team continuity, and professional-development policies. Teachers remain responsible, but their responsibility must be understood within a network of institutional and public responsibilities.

The report by Todos Pela Educação (2024) reinforces the need to monitor goals, trajectories, and inequalities in basic education. For schools, indicators should be converted into localized pedagogical questions. Failure, attendance, and dropout rates can be analyzed by educational stage, class, and student profile while preserving confidentiality. The objective is not to label groups, but to identify recurring barriers. When data are discussed collectively, they become planning tools. When used solely to compare schools or hold professionals accountable, they may encourage selection, teaching to the test, and the concealment of the most difficult problems.

Racial inequality requires specific attention because it operates through material conditions and symbolic expectations. IBGE (2022) shows that differences in access to rights and opportunities remain strongly related to color or race. In everyday school life, prejudice may appear in the selection of examples, distribution of speaking opportunities, interpretation of behavior, and performance expectations. Antidiscriminatory practice requires reviewing materials, observing interactions, and intervening when stereotypes arise. It also requires high expectations accompanied by support, avoiding both neglect and the paternalistic reduction of the curriculum.

Culture, identity, and the intercultural curriculum

The fourth area showed that culture cannot be treated as a festive addition to the curriculum. Candau and Ivenicki (2024) understand an intercultural perspective as a way of analyzing identities, differences, and power relations in educational processes. This implies recognizing that the curriculum is already culturally situated, even when presented as universal and neutral. The central question is not whether culture will enter the school, but which cultures will be legitimized, how they will be represented, and who will have the authority to interpret them. Intercultural practice combines the right to common knowledge with openness to different experiences and ways of producing meaning.

Oliveira and Almeida (2023) provide a concrete example by discussing Indigenous themes in a public school. The intervention they analyzed showed that students' perceptions can be revised when pedagogical work challenges stereotypes and brings diverse narratives into closer contact. The result suggests that representation must be accompanied by contextualization. Including images or commemorative dates without examining historical and contemporary relationships may reinforce exoticization. A critical approach presents plurality among peoples, Indigenous authorship, struggles for rights, knowledge production, and current presence in rural and urban settings.

Interculturality also changes pedagogical communication. Forms of language familiar to students can serve as a starting point, but should not limit the horizon of learning. Schools are responsible for broadening repertoires and teaching forms of language valued in different social spheres. Silva Junior (2023) contributes by conceiving understanding as an encounter between horizons. Teachers begin with what students say and know, introduce concepts and sources that challenge initial interpretations, and guide a shared process of development. Thus, welcoming students does not mean automatically affirming every opinion, but creating conditions for opinions to be examined and transformed.

An intercultural curriculum requires attention to bibliographic and visual selections. The authors, historical figures, scientists, and artists presented throughout the year communicate who can produce knowledge and occupy prominent positions. Candau and Ivenicki (2024) advocate educational research capable of revealing networks of oppression and coloniality. In practice, curricular review can map presences and absences, compare perspectives on the same topic, and include works by historically marginalized groups. The objective is not to replace one closed canon with another, but to broaden problems, sources, and opportunities for intellectual identification.

Assessment also has a cultural dimension. Questions framed within excessively specific contexts may measure social familiarity rather than the intended knowledge. Oral participation, in turn, may favor students accustomed to particular communication codes. Recognizing this influence does not require abandoning common standards. It requires making criteria explicit, offering varied examples, allowing preparation, and combining assessment instruments. Ernica, Rodrigues, and Soares (2025) show the importance of examining inequalities within results. This principle can guide the revision of items and activities that produce systematic patterns of difficulty not explained by the learning objective.

In school relationships, an intercultural perspective requires clear protocols for addressing discrimination and conflict. Dialogue should not be used to relativize violations, but to understand what occurred, hold individuals accountable for their conduct, and rebuild relationships when possible. Lima (2024) connects rights as practiced with democracy and warns of mechanisms that produce new inequalities. A democratic school combines participation with the protection of rights. This means ensuring students have a voice without transferring institutional responsibilities to them and maintaining ethical points of reference that preserve dignity, safety, and opportunities for

learning.

Integrating educational foundations into teaching practice

Integrating the results makes it possible to propose a sequence of reflection for pedagogical practice. Philosophical foundations inquire into the purposes of education and conceptions of knowledge. Historical foundations investigate the origins and continuities of routines. Social foundations analyze the distribution of opportunities, resources, and outcomes. Cultural foundations examine representations, forms of language, and relationships among differences. Applied together, these questions help teachers evaluate objectives, content, mediation, and assessment instruments. The aim is not to add four bureaucratic steps to the lesson plan, but to develop a professional habit of evidence-based decision-making.

A coherent practice begins with diagnosis, defines essential learning, and selects experiences compatible with the objectives. During mediation, the teacher monitors participation, records questions, and adjusts support. During assessment, the teacher examines conceptual mastery, capacity for application, and inequalities in progress. Fiorese and Trevisol (2024) show that innovation must go beyond an immediate association with novelty. In light of the foundations analyzed, an innovation is pedagogically relevant when it expands intellectual participation, improves understanding, addresses barriers to access, and remains ethically consistent with the right to education.

Technology can contribute to this integration when used with clear intent. UNESCO (2023) warns that its educational value depends on the conditions and purposes of its use. Soares, Cardoso, and Mueller (2022) note that virtual information culture involves identities and social relationships, requiring critical interpretation. Planning should therefore provide for source verification, data protection, accessibility, and alternatives for students with limited connectivity. The choice of technology ceases to be an automatic sign of modernity and is instead evaluated according to its actual contribution to learning and equity.

CONCLUSION

The study analyzed how philosophical, historical, social, and cultural foundations influence the development of contemporary pedagogical practices. The review showed that these foundations are not forms of knowledge removed from everyday school life. They provide criteria for interpreting and guiding decisions concerning objectives, curriculum, mediation, authority, participation, and assessment. The research question was answered by demonstrating that more conscious, contextualized, and democratic practices emerge when teachers connect educational purposes, the historicity of schools, the social conditions of learning, and cultural plurality.

The overall objective was achieved by integrating the four areas. The first specific objective showed that human development, knowledge, and dialogue require a connection among conceptual rigor, listening, and the transformation of understanding. The second showed that school routines and results must be examined in light of historical processes and concrete inequalities. The third enabled discussion of diversity and innovation as commitments permeating all planning rather than as occasional activities. The literature indicated that novelty acquires pedagogical value only when it positively changes the conditions of participation and learning.

As a contribution, the article proposes understanding teaching as an intellectual, ethical, and political practice supported by justifiable decisions. This understanding avoids two reductive views: the belief that sound principles eliminate the need for instructional organization, and the idea that efficient techniques can dispense with purposes and context. Pedagogical practice must bring together

foundations and procedures. It must also maintain high expectations, provide differentiated support, examine internal inequalities, and select points of reference that broaden students' cultural representation.

The narrative review has limitations arising from its time frame, language, and interpretive selection. Future studies may investigate how teachers mobilize these foundations and analyze interventions that connect equity, interculturality, and formative assessment. Even so, the results support a central conclusion: reflecting on educational foundations improves planning, reduces superficial adherence to trends, and strengthens coherent responses to contemporary educational challenges.

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ADHERENCE TO AND DISCONTINUATION OF LEPROSY TREATMENT IN THE MUNICIPALITY OF PILAR, ALAGOAS (2021–2025): CLINICAL-EPIDEMIOLOGICAL PROFILE AND OUTCOME-RELATED CHARACTERISTICS ACCORDING TO SINAN/DATASUS DATA

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ABSTRACT

Leprosy remains an important public health problem, particularly in settings characterized by social vulnerability, delayed diagnosis, and challenges in treatment continuity. This study aimed to analyze the clinical and epidemiological profile of leprosy cases among residents of Pilar, Alagoas, from 2021 to 2025, describing patterns of treatment completion, cure, and treatment abandonment, as well as the sociodemographic, clinical, and operational characteristics related to these outcomes. This was an epidemiological, observational, retrospective, descriptive, and quantitative study based on secondary data from the Notifiable Diseases Information System (SINAN), made available through TABNET/DATASUS. A total of 32 new cases were analyzed. The highest numbers of diagnoses occurred in 2022 and 2023. The cases were characterized by a predominance of individuals identified as brown (pardo), a higher concentration among adults, a high frequency of low educational attainment, and higher proportions of multibacillary cases and the borderline clinical form. Most cases were detected through spontaneous presentation or referral. Regarding treatment outcomes, 25 cases were classified as cured, three as treatment abandonment, and four had no recorded type of discharge. Among the

evaluable cohorts, the 2023 and 2024 cohorts achieved 100% cure, whereas the 2025 cohort showed a lower cure proportion and a higher proportion of treatment abandonment. The findings indicate that, despite the predominance of cure, challenges remain in early diagnosis, treatment follow-up, contact surveillance, and data quality.

Keywords: Leprosy. Treatment adherence. Treatment abandonment.

INTRODUCTION

Leprosy remains a neglected tropical disease of major public health relevance, despite being curable and having free treatment available. Caused primarily by *Mycobacterium leprae*, it has a chronic course, tropism for the skin and peripheral nerves, and the potential to cause sensory, motor, and autonomic changes, physical disabilities, and psychosocial repercussions. In 2024, 188 countries, areas, and territories reported 172,717 new cases, of which 9,397 occurred in children and 9,157 already presented grade 2 physical disability at diagnosis (World Health Organization, 2025). These indicators show that active transmission, late diagnosis, and preventable sequelae persist in different settings, requiring elimination to be understood not merely as a numerical reduction, but as sustained interruption of transmission, prevention of disabilities, and efforts to address stigma.

Brazil occupies a central position in this scenario, since in 2024 alone, 22,129 new cases were recorded, corresponding to a detection rate of 10.41 per 100,000 inhabitants; among them, 921 occurred in children under 15 years of age, with a rate of 2.19 per 100,000 in this population (Brasil, 2026a). The occurrence of leprosy in children is particularly relevant because it serves as a marker of recent transmission and of failures in the timely detection of sources of infection in the territory. In addition, the concentration of the disease in socially vulnerable areas confirms that leprosy cannot be explained solely by biological factors. Housing conditions, income, education, access to health services, discrimination, and the organization of the health care network influence the risk of illness, the timing of diagnosis, and continuity of care (Jesus et al., 2023).

Leprosy treatment is based on multidrug therapy, consisting of rifampicin, dapsone, and clofazimine. Six doses are recommended for cases classified as paucibacillary, whereas multibacillary cases receive 12 doses, according to the criteria established by the Brazilian Ministry of Health (Brasil, 2022). Appropriate treatment cures the disease, interrupts the chain of transmission after treatment is initiated, and helps prevent progression of neural impairment and disabilities. However, treatment completion depends not only on the availability of medications, but also on continuous follow-up provided by health services.

In this context, adherence should not be understood as simple patient compliance with the medication prescription. Continuation in treatment may be influenced by understanding of the disease, perceived improvement, occurrence of adverse events, the relationship with the health care team, family support, socioeconomic conditions, accessibility of services, and the health care network's capacity to identify and follow patients who miss appointments. Cruz and Franchi (2025), when investigating people who discontinued multidrug therapy, identified factors related to nonadherence, including lack of perceived improvement and questioning of the diagnosis. These findings reinforce the need for clear communication, health education, and longitudinal follow-up throughout treatment.

Social inequalities must also be considered when understanding different therapeutic trajectories. Jesus et al. (2023) emphasize that social vulnerability, stigma, and difficulties in accessing services may overlap and produce trajectories marked by late diagnosis, difficulties in continuity of care, and a greater risk of disabilities. Thus, sociodemographic and clinical characteristics should not be interpreted in isolation, but rather within the social and health care context in which people affected by leprosy live.

In Brazil, treatment discontinuation remains an important challenge for disease control. Between 2014 and 2023, 241,460 new cases belonging to follow-up cohorts were analyzed, of which 14,766, equivalent to 6.1%, were closed as treatment discontinuation. Among these records, 78.1% were multibacillary, 43.9% had been detected through spontaneous demand, and 7.5% presented grade 2 physical disability at diagnosis. During the same period, the national proportion of treatment

discontinuation increased from 4.5% to 8.0%, while in the Northeast it rose from 4.4% to 7.6%. In Alagoas, it increased from 3.6% to 4.6%, showing a statistically stationary trend over the period analyzed (Brasil, 2025a). These data demonstrate that, even in locations where percentages remain within parameters considered satisfactory, treatment interruption continues to require surveillance, especially because of differences among municipalities.

The period from 2021 to 2025 deserves attention because it includes years still marked by the effects of the COVID-19 pandemic and the subsequent reorganization of health services. Leprosy detection declined markedly during the public health emergency, followed by recovery in subsequent years. Changes in health service utilization, interruption of community activities, reduced contact examination, and difficulties in accessing Primary Health Care may have affected patient diagnosis and follow-up (Brasil, 2025b). Silvério et al. (2024), when analyzing the follow-up of people affected by leprosy during the pandemic, identified weaknesses related to the availability of health professionals and medications and to users' understanding of the disease. Therefore, fluctuations observed in the first years covered by this study should also be interpreted in light of the functioning of health services, without automatically attributing these variations to changes in disease transmission.

In the state of Alagoas, Lima et al. (2025) identified a significant reduction, between 2010 and 2022, in prevalence, overall detection, and detection among children under 15 years of age. Annual reductions were 2.89% for prevalence, 4.43% for overall detection, and 6.03% for detection among children under 15. However, spatial analysis revealed substantial heterogeneity among municipalities and different stages in the elimination process. In 2022, only 27 municipalities were classified as non-endemic, while the others remained at stages requiring actions aimed at interrupting transmission, achieving elimination, or conducting post-elimination surveillance. The authors also emphasize that low numbers or absence of notifications do not necessarily mean absence of transmission, since underdiagnosis, limited active case-finding capacity, and weaknesses in surveillance systems may affect the records.

In this regard, a specific analysis of Pilar is relevant because state-level indicators may not fully reflect the municipality's epidemiological and health care reality. The use of SINAN data made available through TABNET is an important tool for this investigation because it brings together epidemiological, clinical, and operational information related to leprosy, such as year of diagnosis, sex, age group, race/skin color, education, operational classification, clinical form, mode of detection, grade of physical disability at diagnosis, slit-skin smear, initial treatment regimen, number of skin lesions, and type of case closure. This information makes it possible to characterize the case profile, examine closure patterns, and conduct descriptive comparisons between cases closed as cure and treatment discontinuation.

Thus, investigating new leprosy cases among residents of Pilar, Alagoas, between 2021 and 2025 makes it possible to characterize the recent dynamics of the disease at the municipal level and identify relevant aspects of treatment follow-up. The analysis allows examination of the temporal distribution of diagnoses, the patients' sociodemographic and clinical-epidemiological profile, modes of detection, the presence of disabilities at diagnosis, and case-closure patterns. It also makes it possible to compare, exclusively descriptively, the characteristics of patients whose cases ended in cure or treatment discontinuation and to assess the proportions of these outcomes in cohorts with an adequate follow-up period.

Therefore, this study aims to analyze the clinical-epidemiological profile of leprosy cases among residents of the municipality of Pilar, Alagoas, from 2021 to 2025, describing patterns of treatment completion, cure, and discontinuation, as well as sociodemographic, clinical, and operational characteristics related to these outcomes, based on SINAN data made available by DATASUS. The

relevance of this study lies in the possibility of developing a local understanding of cases and their treatment outcomes, providing information that may contribute to strengthening epidemiological surveillance, early diagnosis, patient follow-up, disability prevention, and strategies aimed at reducing treatment discontinuation.

METHODOLOGY

Study design and type

This was an epidemiological, observational, retrospective, descriptive, and quantitative study developed from secondary leprosy data recorded in the Notifiable Diseases Information System (SINAN) and publicly made available by the Department of Information and Informatics of the Brazilian Unified Health System (DATASUS) through the TABNET tool. The study was considered retrospective because it used information on previously recorded cases; descriptive because it characterized the clinical-epidemiological distribution and treatment outcomes; and quantitative because the data were organized into absolute frequencies, proportions, and annual distributions, without the use of inferential statistical methods.

The period of interest covered the years 2021 to 2025. This timeframe allowed analysis of five recent consecutive years, including different stages in the organization of health services after the onset of the COVID-19 pandemic and making it possible to observe changes in case distribution and treatment outcomes over time.

Data source and study population

The data source was TABNET/DATASUS, under the Epidemiology and Morbidity group, using SINAN information on leprosy cases. DATASUS makes consolidated SINAN data available through TABNET, a public tool designed to organize and tabulate health information according to filters defined by the researcher (Brasil, 2026).

The study population consisted of leprosy records for residents of the municipality of Pilar, state of Alagoas, from 2021 to 2025, according to data availability on the platform. Municipality of residence was selected so that the analysis would epidemiologically represent the population residing in Pilar, avoiding inclusion of people notified or followed at services located in the municipality but residing elsewhere. The study had a census-based approach because all aggregated records available in TABNET that met the established filters were used.

Selection criteria and filters used

Data were collected from the DATASUS portal, in the TABNET health information area, using the module dedicated to SINAN epidemiological data. The state of Alagoas, municipality of residence Pilar, and the years corresponding to 2021 through 2025 were selected. The content used in the tabulations was record frequency, and rows and columns were modified according to the variable under investigation.

For the general characterization of the epidemiological profile, cases recorded during the period and available in the leprosy tabulation were considered. When the analysis specifically addressed cure and treatment discontinuation indicators, new cases were prioritized, since official indicators for evaluating treatment effectiveness are calculated among new cases belonging to follow-up cohorts. This distinction was necessary because transfers, relapses, and other re-entries represent different epidemiological situations and could artificially alter cure or treatment discontinuation proportions.

The Brazilian Ministry of Health's Manual for Tabulation of Leprosy Indicators recommends that these outcomes be analyzed by considering new cases, municipality of residence, operational classification, and type of case closure (Brasil, 2026).

Leprosy records for residents of Pilar within the established period and presented by TABNET in the selected categories were included. For analyses of the general profile, ignored or unreported categories were retained when available, allowing assessment of data completeness. For the specific calculation of cure and treatment discontinuation indicators, the inclusion and exclusion criteria recommended by the Ministry of Health were followed, especially regarding mode of entry and type of case closure.

Transfers to other health units, municipalities, states, or countries, deaths, and diagnostic errors were not considered treatment discontinuation. Treatment discontinuation was also not presumed when the type of case closure was blank or missing, since lack of completion does not necessarily mean interruption of treatment. This decision avoided overestimating the treatment discontinuation outcome.

Analysis variables

Variables were selected according to their availability in TABNET and their relevance to characterizing the case profile and understanding patterns related to different treatment outcomes. In the sociodemographic component, sex, age group, race/skin color, and education were analyzed when available in the public tabulation.

In the clinical-epidemiological component, variables such as year of diagnosis or notification, mode of entry, mode of detection, operational classification, clinical form, grade of physical disability at diagnosis, treatment regimen, and other information presented by the system that allowed characterization of the disease and case follow-up were considered. For treatment assessment, the main variable used was type of case closure, comprising categories such as cure, transfers, death, treatment discontinuation, and diagnostic error. The official SINAN follow-up instrument also uses information such as operational classification, treatment regimen, number of doses, disability assessment, and type of case closure to monitor leprosy cases.

The categories 'ignored,' 'blank,' 'not assessed,' or equivalent were retained and presented whenever made available by TABNET. This strategy avoided artificial redistribution of cases among known categories and made it possible to assess limitations related to the quality of data completion.

Definition of adherence, cure, and treatment discontinuation outcomes

Because this study was based on aggregated TABNET data, treatment adherence was not interpreted as a directly measured individual variable. TABNET does not allow assessment of patient behavioral aspects, such as motivation to remain in treatment, correct home use of medications, or personal reasons for attending appointments. For this reason, adherence was operationalized based on outcomes available in the system, primarily using treatment completion through cure as a favorable indicator of therapeutic continuity.

The 'cure' category was considered according to the closure status reported in SINAN. According to the Ministry of Health, discharge due to cure presupposes compliance with treatment regularity criteria, considering the number of doses and the time established for the treatment regimen. Therefore, this study did not directly assign adherent status to each individual, but analyzed the proportion of treatment completion through cure as an operational indicator related to adherence.

Treatment discontinuation was defined according to the classification already recorded in SINAN. According to the Ministry of Health, discontinuation is defined, for paucibacillary cases, as absence from the health service for more than three consecutive months and, for multibacillary cases, for more than six consecutive months since the last visit, despite attempts to return the patient to follow-up. Thus, no study-specific criteria were created to determine discontinuation; only the classification made available by the system was used (Brasil, 2026).

When applicable, the treatment discontinuation proportion was calculated as the number of new cases closed as treatment discontinuation divided by the total number of eligible new cases in the respective cohort, multiplied by 100. Similarly, the cure proportion was obtained by dividing new cases closed as cure by the total number of new cases included in the analyzed cohort, multiplied by 100.

The parameters established by the Ministry of Health were used to interpret these indicators. For treatment discontinuation, proportions below 10% are classified as good; from 10% to 24.9%, fair; and 25% or higher, poor. For cure, a proportion of 90% or higher is considered good, 75% to 89.9% fair, and below 75% poor (Brasil, 2026).

Follow-up cohorts and handling of 2025 data

Specific care was taken in analyzing treatment outcomes because the year of diagnosis does not necessarily correspond to the year of treatment closure. The Ministry of Health recommends that cure and treatment discontinuation indicators be calculated by cohorts, considering paucibacillary and multibacillary cases separately because of differences in the time required for follow-up. For evaluation in a given year, PB cases diagnosed in the previous year and MB cases diagnosed two years earlier are considered (Brasil, 2026).

Accordingly, the 2021–2025 series was used in full to describe the epidemiological profile of cases diagnosed or recorded during the period. However, in the evaluation of cure and treatment discontinuation, records that had not yet had sufficient time for outcome determination were not automatically classified as lack of adherence. Particularly for 2025, cases without definitive closure were presented separately when necessary, avoiding interpretation of records still under follow-up as treatment discontinuation or therapeutic failure.

This procedure was especially important for multibacillary cases, which require a longer follow-up period. Thus, only cohorts with sufficient follow-up time were used in consolidated cure and treatment discontinuation calculations, preserving indicator comparability and reducing the risk of underestimating treatment completion.

Data processing and analysis

Tables produced in TABNET were exported and organized in Microsoft Excel spreadsheets. After extraction, the applied filters, selected years, municipality of residence, and variable categories were checked to ensure that the tables corresponded to the same analytical universe.

The analysis was exclusively descriptive, without hypothesis testing, regression, p-value calculation, confidence intervals, or other inferential statistical techniques. Absolute numbers and percentages were used to present sociodemographic, clinical, and epidemiological characteristics, as well as types of case closure and treatment outcomes. Proportions were calculated by dividing the frequency of each category by the corresponding valid total and multiplying by 100.

Temporal evolution was examined through the distribution of records from 2021 to 2025, making it possible to identify increases, decreases, or relative stability in frequencies and proportions over the

years. Results were presented in five (5) tables and two (2) charts prepared from tabulations extracted from DATASUS.

To explore factors related to outcomes, descriptive comparisons were made between cure and treatment discontinuation categories according to variables available in TABNET, such as sex, age group, race/skin color, education, operational classification, clinical form, grade of disability, and other information that could be cross-tabulated on the platform. Because inferential methods were not used, the expression 'associated factors' was used to refer to characteristics showing differences or proportional concentration between the analyzed outcomes, without implying a statistically proven association, independent effect, or causal relationship.

Interpretation of the findings considered the inherent limitations of secondary databases, including the possibility of underreporting, incomplete data entry, ignored records, subsequent updates, and inability to retrieve information not available in aggregated tabulations. The Ministry of Health emphasizes that follow-up indicators depend directly on proper updating of SINAN records and that recent information may change as databases are consolidated (Brasil, 2026).

Ethical considerations

The study used exclusively secondary, aggregated, anonymized, publicly accessible data made available by the Ministry of Health through TABNET/DATASUS. There was no access to names, document numbers, addresses, medical records, individual forms, or any other information that could identify people registered in the system. The Ministry of Health itself characterizes TABNET as a public-domain tool for organizing and consulting health information.

For this reason, the study was not submitted to the CEP/Conep System, since it used only previously aggregated data with no possibility of individual identification. Circular Letter No. 17/2022 of the National Research Ethics Commission clarifies that the exemption from submission provided for aggregated databases covers research using public databases such as DATASUS and IBGE (Brasil, 2022).

Even though public information was used, the principles of scientific responsibility, fidelity to the original data, transparency in describing procedures, confidentiality, and presentation of results exclusively in aggregated form were observed. No attempt at individual identification or re-identification was made at any stage of the research.

RESULTS AND DISCUSSION

This section presents and discusses the results concerning new leprosy cases diagnosed among residents of the municipality of Pilar, Alagoas, from 2021 to 2025. The analysis was organized to address the annual evolution of cases, sociodemographic profile, clinical-epidemiological characteristics, types of case closure, and differences observed between cure and treatment discontinuation outcomes. Cohorts with an adequate follow-up period were also considered, allowing examination of cure and treatment discontinuation proportions according to criteria established by the Ministry of Health. The findings were interpreted in an integrated manner, relating local results to scientific evidence and epidemiological and operational leprosy indicators, as shown in the following tables and charts.

Table 1 — Annual distribution of new leprosy cases among residents of Pilar, Alagoas, 2021–2025

Year of diagnosis	New cases (n)	Distribution during the period (%)
2021	6	18,8
2022	9	28,1
2023	9	28,1
2024	4	12,5
2025	4	12,5
Total	32	100,0

Source: Prepared by the author based on data from the Notifiable Diseases Information System (SINAN), made available through TABNET/DATASUS, 2026.

The temporal distribution showed 32 new leprosy cases in Pilar between 2021 and 2025, increasing from six cases in 2021 to nine in 2022, remaining at that level in 2023, and declining to four cases per year in 2024 and 2025. Thus, 2022 and 2023 accounted for 56.2% of diagnoses during the period. This pattern is primarily compatible with a recovery in detection capacity after the limitations imposed by the COVID-19 pandemic, and not necessarily with an abrupt increase in transmission during those two years. At the national level, the Ministry of Health documented a sharp decline in leprosy detection in 2020, followed by growth in new cases in 2021, 2022, and 2023, attributing part of this dynamic to the repercussions of the pandemic on health services (Brasil, 2026).

The reduction from nine to four cases between 2023 and 2024, equivalent to 55.6%, which persisted in 2025, may represent a recent decrease in detected occurrence. However, it is not sufficient to establish a sustained reduction in transmission. In municipalities with a small absolute number of cases, changes of only a few records produce substantial percentage variations. In addition, the analysis of Alagoas showed a downward trend in detection between 2010 and 2022, but also marked municipal heterogeneity and the possibility of underdiagnosis and underreporting; therefore, a lower number of recorded cases does not automatically indicate epidemiological control (Lima et al., 2025).

Accordingly, the most consistent interpretation is that Pilar showed fluctuations in detection, with a possible recovery in diagnostic capacity in 2022–2023 and a recent reduction in records in 2024–2025. This decline should be confirmed by other clinical and operational indicators before being interpreted as an actual reduction in disease burden.

Table 2 — Sociodemographic profile of new leprosy cases among residents of Pilar, Alagoas, 2021–2025

Variable	Category	n	%
Sex	Male	16	50,0
	Female	16	50,0
	Total	32	100,0
Age group	5 to 9 years	1	3,1
	10 to 14 years	1	3,1
	15 to 19 years	1	3,1
	20 to 29 years	4	12,5
	30 to 39 years	3	9,4
	40 to 49 years	8	25,0
	50 to 59 years	5	15,6
	60 to 69 years	4	12,5
	70 to 79 years	3	9,4
	80 years and older	2	6,3
	Total	32	100,0

Race/skin color	White	7	21,9
	Black	3	9,4
	Brown (parda)	22	68,8
	Total	32	100,0
Education	Ignored/blank	8	25,0
	Illiterate	8	25,0
	Incomplete grades 1–4 of elementary school	4	12,5
	Completed grade 4 of elementary school	2	6,3
	Incomplete grades 5–8 of elementary school	2	6,3
	Incomplete high school	1	3,1
	Completed high school	6	18,8
	Incomplete higher education	1	3,1
	Total	32	100,0

Source: Prepared by the author based on data from the Notifiable Diseases Information System (SINAN), made available through TABNET/DATASUS, 2026.

Table 2 reveals a sociodemographic profile characterized by equal distribution between the sexes, concentration of cases in adulthood, predominance of people identified as Brown (parda), and a high frequency of low educational attainment. Men and women each represented 50.0% of cases. This balance differs partially from the recent national pattern, in which males remain more frequent among new cases; in 2023, for example, men accounted for 55.4% of diagnoses in Brazil (Brasil, 2025). In Pilar, therefore, the disease was not concentrated in a specific sex, indicating that, during the period analyzed, exposure and detection occurred similarly among men and women.

With regard to age, the highest concentration was among people aged 40–49 years (25.0%), followed by those aged 50–59 years (15.6%). Together, these two groups accounted for 40.6% of cases, demonstrating a substantial disease burden among working-age adults. In addition, 28.2% of records involved people aged 60 years or older. This pattern is consistent with the national profile, in which leprosy occurs substantially among adults and older people; in 2023, 53.6% of new Brazilian cases were among people aged 30–59 years and 29.6% among those aged 60 years or older (Brasil, 2025). The concentration at older ages is also compatible with the long incubation period of the disease and reinforces the need for timely diagnosis to prevent accumulated disabilities.

An epidemiologically relevant finding was the occurrence of two cases among children under 15 years of age, equivalent to 6.2% of the total. Detection in this age group is recognized by the Ministry of Health as a marker of recent transmission and persistence of the transmission chain, since children generally have less cumulative exposure time. In 2024, children under 15 represented 4.1% of new Brazilian cases, and the Northeast still had a detection rate considered high in this population (Brasil, 2026). Thus, the presence of childhood cases in Pilar is evidence that transmission has not been completely interrupted and reinforces the importance of systematic contact investigation.

Regarding race/skin color, 68.8% of cases occurred among people identified as Brown (parda); when Brown and Black individuals are considered together, they represent 78.2% of records. This profile is consistent with the national scenario, in which 72.0% of new cases in 2024 occurred among people who self-identified as Black or Brown (Brasil, 2026). This result should not be interpreted as a biological predisposition related to race/skin color, but within the context of social determinants, since leprosy remains strongly associated with economic, social, housing, and health care access inequalities (Jesus et al., 2023; Brasil, 2026).

Educational attainment reinforces this vulnerability profile. One quarter of cases involved people who were illiterate (25.0%). Among the 24 records with known education, 16 individuals, or 66.7%, were illiterate or had not completed elementary school. Low educational attainment may limit

understanding of the early signs of the disease, treatment instructions, and the importance of continuous follow-up, constituting a relevant component of social vulnerability related to leprosy. Nationally, in 2024, 6.7% of cases involved illiterate people and 41.0% had incomplete or complete elementary education (Brasil, 2026). Therefore, the profile observed in Pilar shows a particularly high concentration of low educational attainment among recorded cases.

Finally, the 25.0% of records with education classified as ignored or blank represent a relevant operational limitation. This percentage exceeds the 19.9% incompleteness of this variable recorded nationally in 2024 and reduces the precision of patients' social characterization (Brasil, 2026). Taken together, the results depict a scenario in which leprosy affects both sexes, is concentrated mainly among middle-aged adults, reaches socially vulnerable groups, and remains present among children under 15 years of age, simultaneously indicating persistent transmission and the need to strengthen contact surveillance and early diagnosis.

Table 3 — Clinical-epidemiological characteristics of new leprosy cases among residents of Pilar, Alagoas, 2021–2025

Variable	Category	n	%
Operational classification	Paucibacillary (PB)	12	37,5
	Multibacillary (MB)	20	62,5
	Total	32	100,0
Clinical form	Indeterminate	9	28,1
	Tuberculoid	4	12,5
	Borderline	17	53,1
	Lepromatous	2	6,3
	Total	32	100,0
Mode of detection of new case	Ignored/blank	1	3,1
	Referral	12	37,5
	Spontaneous demand	13	40,6
	Community screening	2	6,3
	Contact examination	3	9,4
	Other modes	1	3,1
	Total	32	100,0
Grade of physical disability at diagnosis	Grade 0	16	50,0
	Grade I	11	34,4
	Grade II	3	9,4
	Not assessed	2	6,3
	Total	32	100,0*
Slit-skin smear at diagnosis	Positive	3	9,4
	Negative	0	0,0
	Not performed	29	90,6
	Total	32	100,0
Initial treatment regimen	PQT/PB/6 DOSES	12	37,5
	PQT/MB/12 DOSES	20	62,5
	Total	32	100,0
Number of skin lesions	Reported as 0 or 99	1	3,1
	Single lesion	11	34,4
	2–5 lesions	8	25,0
	>5 lesions	12	37,5
	Total	32	100,0

Source: Prepared by the author based on data from the Notifiable Diseases Information System (SINAN), made available through TABNET/DATASUS, 2026.

Table 3 shows a predominance of multibacillary cases (62.5%), accompanied by a higher frequency of the borderline clinical form (53.1%) and the presence of more than five skin lesions in 37.5% of records. Together, these findings indicate that a substantial proportion of patients reached diagnosis with clinically established disease rather than predominantly early forms. This pattern deserves attention because multibacillary cases have a higher *Mycobacterium leprae* load and greater potential to sustain transmission when untreated. In a national analysis of 228,577 cases, Araújo et al. (2026) also observed a predominance of multibacillary disease and the borderline form; additionally, multibacillary classification was associated with a greater likelihood of grade 2 physical disability.

The mode of detection reinforces this interpretation. Spontaneous demand (40.6%) and referral (37.5%) jointly accounted for 78.1% of diagnoses, whereas contact examination and community screening represented only 15.7%. This demonstrates a predominance of passive detection; that is, diagnosis occurred mainly after patients themselves sought care or were referred, rather than through systematic active case-finding strategies. The Clinical Protocol and Therapeutic Guidelines for Leprosy (PCDT) emphasizes that contact examination is one of the strategies with the strongest evidence base for early detection and recommends clinical evaluation of all household contacts. Therefore, the small contribution of this modality in Pilar reveals a concrete opportunity to strengthen contact surveillance in Primary Health Care (Brasil, 2022).

The grade of physical disability is another relevant indicator. Although 50.0% had grade 0, 43.8% had grade I or II. Considering only the 30 patients assessed, 46.7% had some disability and 10.0% had grade II. Identification of grade II at diagnosis is recognized as evidence of late detection because it represents more advanced neural damage and, in some situations, visible deformities. The 6.3% not assessed also indicate an operational weakness, since neurological assessment is necessary to establish baseline functional status and monitor its progression (Brasil, 2022; Araújo et al., 2026).

Another notable finding was that slit-skin smear microscopy was not performed in 90.6% of cases. This percentage is much higher than the 33.0% of examinations not performed in the national analysis by Araújo et al. (2026). Slit-skin smear microscopy complements the clinical diagnosis, and its absence alone does not invalidate the diagnosis; however, its use helps estimate bacillary load, and a positive smear classifies the case as multibacillary. Thus, the low utilization observed reduces the availability of laboratory information useful for the clinical characterization of cases (Brasil, 2022).

On the other hand, there was complete correspondence between operational classification and the initial treatment regimen: 12 PB cases received PB multidrug therapy for six doses and 20 MB cases received MB multidrug therapy for 12 doses. This concordance indicates that the recorded regimen was appropriate for the operational classification, as recommended by the Ministry of Health. Overall, therefore, the profile found suggests the coexistence of correctly targeted treatment with signs of relatively late detection and strong dependence on spontaneous demand, highlighting early diagnosis, systematic neurological assessment, and strengthening contact examination as priorities.

Table 4 — Distribution of types of case closure among new leprosy cases in residents of Pilar, Alagoas, diagnosed between 2021 and 2025

Type of case closure	n	%
Not completed	4	12,5
Cure	25	78,1
Transfer to another unit in the same municipality	0	0,0
Transfer to another municipality in the same state	0	0,0
Transfer to another state	0	0,0
Transfer to another country	0	0,0
Death	0	0,0
Treatment discontinuation	3	9,4
Subtotal of valid leprosy records	32	100,0
Diagnostic error*	0	0,00

Source: Prepared by the author based on data from the Notifiable Diseases Information System (SINAN), made available through TABNET/DATASUS, 2026.

Table 4 shows that 25 of the 32 cases (78.1%) were closed as cure, while three (9.4%) were recorded as treatment discontinuation and four (12.5%) remained without a completed type of case closure. The predominance of cure indicates that most patients were able to remain in follow-up until treatment completion. However, this result should not be interpreted as the municipality's official cure proportion, because the indicator recommended by the Ministry of Health is calculated from cohorts of new PB and MB cases, respecting different follow-up periods. For this indicator, values $\geq 90\%$ are considered good; thus, the descriptive percentage found suggests that important losses still occur along the care pathway and need to be clarified through cohort analysis (Brasil, 2026).

The 9.4% treatment discontinuation rate deserves particular attention. Although numerically below the official 10% threshold used to classify treatment discontinuation in cohorts, it is very close to this limit and should not be considered irrelevant, especially given the small absolute number of cases. In Brazil, the official treatment discontinuation proportion increased from 4.5% in 2014 to 8.0% in 2023, while in the Northeast it rose from 4.4% to 7.6%, indicating increasing difficulty in maintaining treatment (Brasil, 2025a). Cruz and Franchi (2025) demonstrated that doubts about the disease, lack of perceived improvement, and disbelief in the diagnosis may compromise continuity of multidrug therapy, reinforcing the importance of health education, the care relationship, and active follow-up of patients who miss appointments.

The presence of four records without a reported type of case closure (12.5%) also deserves emphasis. This incompleteness reduces the precision of treatment outcome assessment because some of these patients may have progressed to cure, treatment discontinuation, or another outcome without an update in the system. The Ministry of Health emphasizes that completeness and consistency of records are essential components of SINAN data quality and directly affect the construction of leprosy indicators (Brasil, 2025b). (Brasil, 2025b)

Thus, the findings point to a scenario in which favorable treatment completion predominates, but is accompanied by relevant treatment discontinuation and weaknesses in case closure, indicating the need to strengthen longitudinal follow-up and systematic updating of information.

Table 5 — Sociodemographic and clinical characteristics of new leprosy cases according to cure and treatment discontinuation outcomes, Pilar, Alagoas, 2021–2025

Variable	Category	Cure n (%)	Treatment discontinuation n (%)	Total
Sex	Male	10	2	12
	Female	15	1	16
Age group	5 to 9 years	1	0	1
	10 to 14 years	1	0	1
	15 to 19 years	0	1	1
	20 to 29 years	3	1	4
	30 to 39 years	3	0	3
	40 to 49 years	6	0	6
	50 to 59 years	5	0	5
	60 to 69 years	2	0	2
	70 to 79 years	2	1	3
	80 years and older	2	0	2
Race/skin color	White	4	2	6
	Black	2	0	2
	Brown (parda)	19	1	20
	Asian/Yellow	0	0	0
	Indigenous	0	0	0
	Ignored/blank	0	0	0
Education	Ignored/blank	8	0	8
	Illiterate	5	1	6
	Incomplete grades 1–4 of elementary school	3	0	3
	Completed grade 4 of elementary school	1	0	1
	Incomplete grades 5–8 of elementary school	2	0	2
	Incomplete high school	0	1	1
	Completed high school	6	0	6
	Incomplete higher education	0	1	1
	Paucibacillary	10	2	12
	Multibacillary	15	1	16
Clinical form	Indeterminate	6	2	8
	Tuberculoid	4	0	4
	Borderline	14	1	15
	Lepromatous	1	0	1
Grade of disability at diagnosis	Grade 0	13	1	14
	Grade II	2	0	2
	Not assessed/ignored	1	1	2
Slit-skin smear	Positive	2	0	2
	Negative	0	0	0
	Not performed	23	3	26
	Ignored	0	0	0

Source: Prepared by the author based on data from the Notifiable Diseases Information System (SINAN), made available through TABNET/DATASUS, 2026.

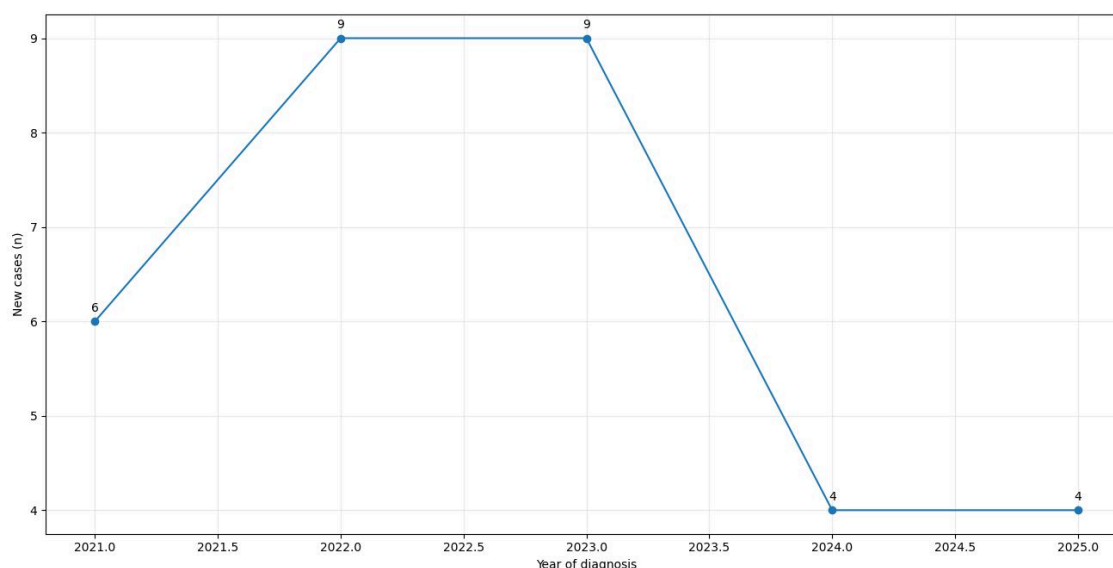
Table 5 allows examination of the characteristics of the 28 cases with outcomes defined as cure or treatment discontinuation, of which 25 progressed to cure and three to treatment discontinuation. In this subset, cure accounted for 89.3% and treatment discontinuation for 10.7%. It is important to distinguish these values from those presented in Table 4, because the four records without a type of case closure are not included in this comparison. In addition, these percentages are descriptive and do not correspond to the official cohort-based cure or treatment discontinuation indicator, which is constructed according to specific criteria established by the Ministry of Health (Brasil, 2026).

Among the three treatment discontinuations, two occurred in men and one in a woman. However, there was no concentration in a single age group: records occurred among those aged 15–19, 20–29, and 70–79 years. No uniform educational pattern was identified either, since the discontinuations involved one illiterate person, one person with incomplete high school education, and one with incomplete higher education. Regarding race/skin color, two discontinuations occurred among White people and one among Brown people. Given the small number of treatment discontinuations, these differences do not support a causal or statistical association between sociodemographic characteristics and treatment interruption. This caution is reinforced by Cruz and Franchi (2025), who found that nonadherence may involve factors extending beyond demographic profile, such as lack of perceived improvement, difficulty accepting the diagnosis, and disbelief in having the disease.

In the clinical component, two of the three treatment discontinuations occurred in paucibacillary cases and one in a multibacillary case; regarding clinical form, two were indeterminate and one borderline. This profile differs from the national scenario between 2014 and 2023, in which 78.1% of cases closed as treatment discontinuation were multibacillary (Brasil, 2025). However, the three cases in Pilar are insufficient to indicate a distinct epidemiological pattern. Regarding physical disability, discontinuations were distributed among grade 0, grade I, and not assessed, with no discontinuation among the two individuals with grade II. The occurrence of one discontinuation among the two patients without a recorded assessment also draws attention to the need for systematic clinical follow-up, considering that neurological and functional assessment is part of the recommended care for people with leprosy (Brasil, 2022).

Finally, none of the three treatment discontinuation cases underwent slit-skin smear microscopy; however, 23 of the 25 cured cases also did not undergo the examination. Therefore, the absence of slit-skin smear microscopy was frequent in both outcomes and cannot be interpreted in these data as a specific characteristic of treatment discontinuation. Taken together, Table 5 does not identify a single profile capable of explaining treatment interruption, but shows that discontinuation occurred in different sociodemographic and clinical groups. This reinforces the need for individualized follow-up, health education, early identification of difficulties during treatment, and active follow-up of patients who miss appointments—measures that are essential to support continuity of multidrug therapy and cure (Cruz; Franchi, 2025; Brasil, 2022).

Chart 1 — Annual trend in new leprosy cases among residents of Pilar, Alagoas, 2021–2025



Source: Prepared by the author based on data from the Notifiable Diseases Information System (SINAN), made available through TABNET/DATASUS, 2026.

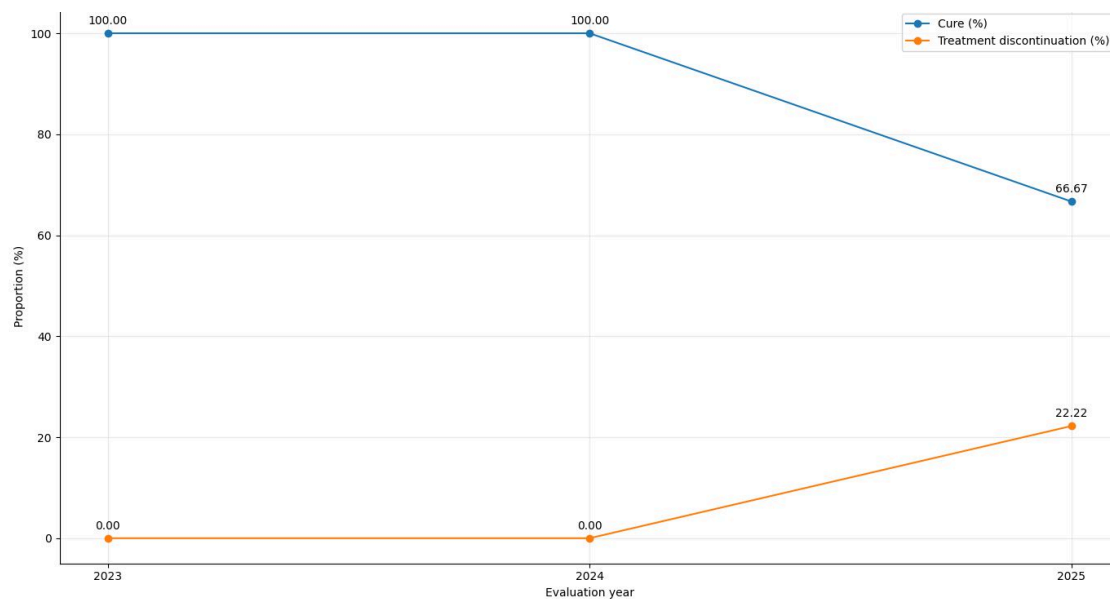
Chart 1 shows a well-defined temporal variation in the detection of new leprosy cases in Pilar, with six diagnoses in 2021, an increase to nine in 2022, maintenance of this number in 2023, and a reduction to four cases in 2024 and 2025. From 2021 to 2022 there was a 50.0% increase, while from 2023 to 2024 there was a 55.6% reduction. Thus, the observed pattern can be divided into two periods: a greater concentration of diagnoses in 2022–2023 and a decrease in records in the following two years.

A plausible epidemiological explanation for the initial increase is the recovery of diagnostic and surveillance capacity after the restrictions caused by the COVID-19 pandemic. In Brazil, the overall detection rate remained reduced in 2021 (8.58 per 100,000 inhabitants), increasing to 9.67 in 2022 and 10.68 in 2023 after the decline recorded during the pandemic (Brasil, 2026). Thus, the increase observed in Pilar in 2022–2023 is compatible with a period of resumed identification of cases that had previously gone undiagnosed or were diagnosed late, in addition to the detection of new cases.

On the other hand, the reduction observed in 2024 and its persistence in 2025 do not, by themselves, allow the conclusion that transmission was interrupted or effectively reduced. Lima et al. (2025) identified a downward trend in detection in Alagoas, but demonstrated substantial heterogeneity among municipalities and warned that few or no recorded cases may coexist with underdiagnosis and underreporting. In Pilar, this caution is even more necessary because of the small absolute number of cases, in which differences of only a few diagnoses produce large percentage variations.

Therefore, the chart indicates a recent reduction in detection, but its epidemiological interpretation must simultaneously consider active case finding, contact examination, early diagnosis, and completeness of notifications. If the 2025 database was identified as partial at the time of extraction, that final year should also be considered subject to updating.

Chart 2 — Comparison of cure and treatment discontinuation proportions among new cases in evaluable cohorts, Pilar, Alagoas, 2023–2025



Source: Prepared by the author based on data from the Notifiable Diseases Information System (SINAN), made available through TABNET/DATASUS, 2026.

Note: Cure and treatment discontinuation proportions were defined according to the official leprosy follow-up cohorts. For each evaluation year, paucibacillary cases diagnosed in the previous year and multibacillary cases diagnosed two years earlier were considered. Records diagnosed in 2025 itself were not included in the consolidated indicator because they had not yet had sufficient time for complete assessment of the treatment outcome.

Chart 2 shows an important change in the performance of treatment cohorts in Pilar. In the evaluation years 2023 and 2024, all cases included in the respective cohorts achieved cure: in 2023 there were nine cures among nine evaluable cases and, in 2024, six among six, resulting in a 100.0% cure proportion and no treatment discontinuation. These results place both cohorts within the parameter considered good by the Ministry of Health for cure, defined as $\geq 90\%$, and also within the good parameter for treatment discontinuation, below 10% (Brasil, 2026a).

The selection of 2023, 2024, and 2025 as evaluation years derives from the official methodology used to construct the cohorts. For each year evaluated, paucibacillary cases diagnosed one year earlier and multibacillary cases diagnosed two years earlier are included. Thus, the 2023 evaluation includes PB cases from 2022 and MB cases from 2021; the 2024 evaluation includes PB cases from 2023 and MB cases from 2022; and the 2025 evaluation includes PB cases from 2024 and MB cases from 2023. Because the study period begins in 2021, 2023 is the first year in which both cohorts can be fully formed without relying on diagnoses before the study period. Likewise, cases diagnosed in 2025 do not appear in this chart because they can only be included in later evaluations: PB cases in 2026 and MB cases in 2027 (Brasil, 2026a).

In 2025, the outcome deteriorated: among nine cases in the cohorts, six achieved cure (66.67%), two were classified as treatment discontinuation (22.22%), and one remained without a completed type of case closure (11.11%). The cure proportion was therefore below the 75% threshold used to classify the indicator as poor, while treatment discontinuation fell within the fair range of 10% to 24.9% (Brasil, 2026a). The simultaneous presence of treatment discontinuation and a record without closure suggests weakness in the follow-up of this cohort, since the cure indicator specifically measures the quality of care, follow-up, and treatment effectiveness (Brasil, 2026b). However,

because only nine cases comprise the 2025 evaluation, small absolute changes produce large percentage variations. Thus, the result should be understood as an operational warning signal, justifying closer monitoring of patients who miss appointments, updating case closures in SINAN, and systematic patient follow-up until treatment completion.

CONCLUSION

This study aimed to analyze the clinical-epidemiological profile of leprosy cases among residents of the municipality of Pilar, Alagoas, between 2021 and 2025, describing patterns of treatment completion, cure, and discontinuation, as well as sociodemographic, clinical, and operational characteristics related to these outcomes, based on SINAN data made available by DATASUS. The general objective was considered achieved, since it was possible to characterize new cases diagnosed during the period, examine their temporal distribution, identify the main sociodemographic and clinical aspects, analyze types of case closure, and descriptively compare the characteristics observed between cases closed as cure and treatment discontinuation.

Thirty-two new cases were analyzed, with the highest number of diagnoses in 2022 and 2023, when nine cases occurred in each year, followed by a reduction to four cases in 2024 and maintenance of that number in 2025. Although this recent decrease is a favorable finding, the data do not support the conclusion that sustained interruption of transmission occurred, especially given the small absolute number of cases, the possibility of underdiagnosis, and the influence of local detection capacity. The presence of two cases among children under 15 reinforces this caution, as it demonstrates that circulation of the disease remained present in the territory during the study period.

Regarding the sociodemographic profile, an equal distribution between men and women was observed, with a predominance of Brown (parda) individuals and the highest concentration in the 40–49-year age group. Educational attainment revealed substantial social vulnerability, with a high proportion of people who were illiterate or had low levels of schooling, in addition to 25.0% of records lacking information in this field. These results demonstrate that addressing leprosy requires consideration not only of clinical aspects, but also of social conditions and the quality of information used by surveillance systems.

In the clinical-epidemiological profile, multibacillary cases, the borderline clinical form, and patients with more than five skin lesions predominated. In addition, spontaneous demand and referral accounted for most modes of detection, while contact examination had a limited contribution. The presence of grade I or II physical disability in a substantial proportion of patients suggests diagnosis at already established stages of the disease. The high proportion of slit-skin smears not performed also deserves attention, although appropriate correspondence was observed between operational classification and the treatment regimen initiated. These findings point to the need to strengthen active case finding, contact examination, neurological assessment, and early diagnosis.

Regarding outcomes, 25 cases were closed as cure, three as treatment discontinuation, and four remained without a completed type of case closure. Among the 28 cases with an outcome defined as cure or treatment discontinuation, no single sociodemographic or clinical profile capable of explaining treatment interruption was identified. The small number of treatment discontinuations and the exclusively descriptive nature of the study preclude establishing statistical or causal associations between the analyzed characteristics and this outcome. In the evaluable cohorts, 2023 and 2024 showed 100% cure and no treatment discontinuation, whereas in 2025 cure fell to 66.67%, treatment discontinuation reached 22.22%, and 11.11% remained without reported closure, representing an important warning signal for patient follow-up.

It is therefore concluded that Pilar made progress in treatment completion, but challenges remain related to early detection, therapeutic continuity, contact surveillance, and completeness of records. Strengthening individualized follow-up, active tracing of patients who miss appointments, health education, periodic disability assessment, and systematic updating of SINAN is recommended. It should also be considered that the results derive from aggregated secondary data and a small number of cases, which do not allow broad generalizations or establishment of causal relationships. Even with these limitations, the study provides a relevant local overview and may contribute to improving leprosy surveillance, care, and prevention activities in the municipality.

For future research, it is recommended to extend the follow-up period and include longer time series in order to determine whether the recent reduction in diagnoses and the worsening observed in the 2025 cohort represent isolated fluctuations or persistent trends. It would also be relevant to conduct studies using an analytical approach and, when possible, individual-level data to investigate more precisely factors related to cure, treatment discontinuation, and late diagnosis. Qualitative research with patients and health professionals may also help to understand barriers to access, reasons for treatment interruption, perceptions of the disease, and difficulties in follow-up. In addition, comparative studies between Pilar and other municipalities in Alagoas may broaden understanding of territorial inequalities and support more specific strategies for leprosy surveillance, prevention, and care.

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ISSN 2764-9733 | DOI 10.5281/zenodo.23062426

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