

Review Article

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Maria Montessori and Her Contributions to Active School and Early Childhood Education: A Systematic Study

Pedro González-Rivera , Johan Méndez Reyes , Christian Torres-Medina , Angie Guevara-Parra

Abstract

Background/purpose. The challenges facing humanity in the first half of the 21st century demand a qualitative transformation of educational processes. Therefore, it is essential to revisit the most significant advances in the history of pedagogical thought and to recognize the enduring relevance of the contributions of prominent educators, including the Italian teacher, Maria Montessori. In this context, the present study aims to analyze Montessori's contributions to the Active School and early childhood education, highlighting the ongoing significance of her life and work in contemporary pedagogy.

Materials/Methods. This study employed a qualitative, interpretative approach through a systematic review of scientific literature, following a documentary and hermeneutic research design. A stepwise review process was applied and is visually represented in the PRISMA flow diagram. The review followed four main stages commonly used in relevant studies: identification, screening, eligibility, and inclusion.

Results. A bibliometric analysis was conducted using the Web of Science and Scopus databases, focusing on titles, keywords, and abstracts. The initial search yielded 21,454 records, which were subsequently analyzed with VOSviewer. This software enabled the visualization of conceptual similarities, the identification of central themes in Montessori's educational philosophy, and the exploration of its intersections with the Active School approach.

Conclusion. Montessori's pedagogy and legacy not only inspire contemporary educational practice but also establish a horizon for pedagogical innovation. Her work continues to challenge and enrich early childhood education in the 21st century, particularly through the principles and practices of the Active School.

1. Introduction

The challenges humanity faces in the first half of the 21st century demand a qualitative transformation of educational processes, oriented toward the integral formation of critical, creative citizens committed to building a more promising future for society. For this reason, it is essential to revisit the most significant advances in the history of pedagogical thought and to recognize the continuing relevance of the proposals of outstanding figures, among them the Italian educator Maria Montessori, whose work, developed in the first half of the 20th century, still offers valuable insights for contemporary educational reflection.

Within the evolution of pedagogical ideas and models, particular attention should be given to the movement that emerged in the late 19th century and became consolidated in the early decades of the 20th century under the designation of the New School, Active School, or Active Pedagogy. This movement arose as an alternative to the traditional model, characterized by authoritarianism, mechanical memorization, and teacher-centered practices. In contrast, the Active School promoted education centered on children's interests, rhythms, and needs, oriented toward their holistic development through freedom, experience, and activity.

Among its most salient features are the conception of the student as the protagonist of the learning process, the recognition of activity as the foundation of knowledge, and the revaluation of the teacher as a guide in an accompanying process. It also highlights the importance of a carefully organized environment to foster child development and the necessity of individualizing educational processes. From this perspective, children construct knowledge through exploration and autonomy, principles that are still affirmed in contemporary pedagogy (Reyes, Rengifo, Nieto, Tacuri & González, 2023).

However, despite the extensive literature on Active Schools, few studies have systematically analyzed the specific influence and theoretical contributions of Maria Montessori within this pedagogical current. This gap justifies the need for a comprehensive study that examines how Montessori's principles intersect with, enrich, and distinguish the broader movement of Active Pedagogy.

Therefore, the present article aims not only to describe Maria Montessori's contributions to the Active School and early childhood education but also to identify the conceptual and methodological foundations that make her approach distinctive in the history of educational thought. This study seeks to highlight the relevance of Montessori's ideas for contemporary education and to discuss their applicability to current pedagogical practices that promote autonomy, creativity, and experiential learning.

Considering this, the research is guided by the following questions: (1) What are the key pedagogical principles proposed by Maria Montessori that align with the Active School movement? (2) In what ways do Montessori's ideas contribute to the development of early childhood education within the framework of active pedagogy? (3) How do these contributions remain pertinent to the educational challenges of the 21st century?

By addressing these questions, the study seeks to bridge the gap in the literature, providing an updated and systematic understanding of Montessori's legacy and its implications for current pedagogical theory and practice.

2. Literature Review

While biographical studies clarify the genesis of Montessori's pedagogical outlook, they often privilege narrative over analysis. Consequently, these works illuminate the intellectual origins of her thought but do not fully explain how her ideas correspond to or diverge from the core tenets of the

Active School tradition in contemporary contexts. This gap underscores the need for a theory-informed and literature-grounded assessment of Montessori's principles in relation to active pedagogy.

2.1. Maria Montessori: A Life and Work Dedicated to Childhood

Maria Montessori was born on August 31, 1870, in Chiaravalle, Italy. From an early age, she demonstrated a profound intellectual curiosity and a strong desire to learn. These attitudes contrasted with the traditional customs of the time, which restricted women's education to domestic matters. Her mother, Renilde Stoppani, played a decisive role in her formation, instilling in her a love for reading and a solid general culture. At the age of 13, she entered a technical secondary school, where she achieved outstanding academic results.

With an innovative vision for her time, she decided to study medicine, a field rarely pursued by women in the late 19th century. In 1896, she became one of the first female physicians to graduate from the University of Rome Sapienza. This professional training decisively influenced her pedagogical thinking, particularly her conception of the child as an integral being encompassing biological, psychological, and spiritual dimensions (Obregón, 2006).

Between 1897 and 1900, she worked at the Psychiatric Clinic of the University of Rome, caring for children with disabilities. This experience led her to observe that beyond medical treatment, these children required broader sensory stimulation. From these insights, she drew fundamental conclusions that became the seed of her educational method. In 1898, her only son was born.

In 1907, she founded her first Casa dei Bambini in San Lorenzo, a working-class district of Rome, and gained international recognition for the remarkable results of her pedagogical approach with vulnerable children aged three to seven. Her method, based on freedom, respect for individual rhythms, and self-education, soon captured worldwide attention. In 1909, she published her first works, where she systematized her principles and practices. Between 1911 and 1915, her ideas spread rapidly throughout the United States, Argentina, and several European countries.

Her visit to the United States in 1912 led to the foundation of the American Montessori Society. Later, between 1939 and 1946, she resided in India, where she continued her pedagogical work with both children and teachers, while deepening her reflections on peace education and children's spirituality. Her firm opposition to fascism forced her into exile in various countries. Between 1949 and 1951, she was nominated for the Nobel Peace Prize three times in recognition of her commitment to a liberating education.

Maria Montessori died on May 6, 1952, in the Netherlands. Her pedagogical legacy, still relevant today, transformed the way education is conceived and continues to inspire child-centered approaches worldwide.

While biographical studies clarify the genesis of Montessori's pedagogical outlook, they often privilege narrative over analysis. Consequently, these works illuminate the intellectual origins of her thought but do not fully explain how her ideas correspond to or diverge from the core tenets of the Active School tradition in contemporary contexts. This gap underscores the need for a theory-informed and literature-grounded assessment of Montessori's principles in relation to active pedagogy.

2.2. Child Education in the Fundamental Works of Maria Montessori

The core of Maria Montessori's pedagogical proposal lies in child freedom, conceived as an essential condition to place the child at the center of the educational process. From this perspective, supporting the natural development of childhood requires creating environments that respond to children's interests and needs, while ensuring that these interests encompass the full scope of the

school curriculum. This entails rigorous teaching practices of observation, developmental analysis, and recognition of learning styles, supported by resources that foster holistic education.

Children actively participate in organizing their daily school life, reinforcing their autonomy and allowing them to assume a leading role in constructing knowledge. As Arapi (2024) notes, control over one's learning process and the establishment of appropriate goals are decisive factors in consolidating autonomous learning environments. According to this author, the most favorable educational setting, according to Montessori, is one in which students take responsibility for their self-education. This autonomy manifests in the freedom to manage work time, start the day with less complex activities before engaging in more demanding tasks, and progress at their own pace within the curriculum plan, without being constrained by rigid schedules imposed by the teacher or institution.

Moreover, the Montessori principle of "following the child" extends beyond pedagogy and emerges as a comprehensive philosophical proposal addressing fundamental existential questions. Her work transcends educational practice by incorporating reflections on life, consciousness, and the value of existence. Through observing child development, Montessori developed a metaphysical vision of life and a pragmatic epistemology that guide the formation of the intellectual virtues necessary to engage with reality critically and creatively. Her moral philosophy links the pursuit of self-perfection with deep respect for human dignity and social solidarity. At the same time, her spiritual perspective recognizes children's capacity to connect with the transcendent through sensory experience (Frierson, 2025).

Similarly, her feminist and pacifist commitment shaped a political conception in which education becomes the foundation of peace and cosmopolitan coexistence. Even when facing the challenges of modernity and technology, Montessori envisioned childhood as a potential means to guide these processes toward service and the betterment of humanity. Consequently, her work reflects the child's education in its broadest sense, integrating philosophical, pedagogical, and didactic dimensions (Frierson, 2025).

Within this framework, a review of some of her most significant works reveals the essential contributions of Montessori to pedagogical science and to child education:

- *The Method of Scientific Pedagogy Applied to the Education of Children (1909)*: Introduces her educational method based on scientific observation of the child. It proposes a prepared environment with appropriate materials that stimulate autonomy, concentration, and a love of learning, while positioning the teacher as a guide rather than a mere transmitter of knowledge.
- *The Child in the Family (1923)*: Reflects on the importance of the family environment for child development and the continuity of educational processes at home.
- *Education and Peace (1934)*: A collection of lectures in which Montessori argues that education grounded in respect, freedom, and holistic child development is essential for building a peaceful and nonviolent humanity. She emphasizes that peace is cultivated through profound transformations in the human mind from early childhood.
- *The Secret of Childhood (1936)*: Presents the child as a being with enormous potential, often misunderstood by adults. It emphasizes the necessity of providing an autonomous education in a suitable environment and rejects authoritarian methods.
- *The Absorbent Mind (1949)*: Introduces the concept of the absorbent mind, describing young children's unique capacity to learn effortlessly through interaction with their environment, assimilating language, culture, and social experiences.

- *Education of Human Potential (1948)*: A mature work outlining her holistic vision of education as a pathway to full human development—physical, intellectual, emotional, and spiritual—and offering guidance for supporting children at each stage of growth.
- *The Secret of Childhood (1982, posthumous)*: Provides a profound reflection on childhood potential and its role in building a new world, emphasizing the importance of ensuring optimal conditions from the earliest years of life.

Montessori articulates a coherent pedagogical framework—freedom within limits, the prepared environment, scientific observation, and sensorial materials. However, secondary literature is applied inconsistently to these constructions in relation to the Active School. Some studies emphasize historical continuity, whereas others foreground tensions related to collectivism, symbolic expression, or scalability.

Despite the conceptual clarity achieved in defining Montessori's principles and their potential intersections with the Active School movement, few studies have undertaken a critical synthesis of the empirical evidence supporting these theoretical correspondences. Prior research tends to remain descriptive, focusing on philosophical or historical overviews rather than on systematic evaluations of implementation and impact. Consequently, literature offers limited insight into how Montessori-inspired practices have been empirically validated, adapted, or contested within different sociocultural and educational contexts. Furthermore, comparative studies that analyze Montessori's ideas alongside other active education models—such as those of Dewey, Decroly, or Freinet—are scarce and often methodologically fragmented. This lack of integrative perspectives limits understanding of how Montessori's framework aligns with or diverges from broader currents of progressive pedagogy. A more critical approach is required to assess the conceptual coherence, practical feasibility, and epistemological foundations of both traditions.

Building upon this analysis, the review identifies persistent gaps in the existing body of literature: (a) the absence of robust comparative frameworks linking Montessori's pedagogical model with the epistemological and methodological foundations of the Active School; (b) the limited empirical validation of Montessori-based interventions in contemporary educational contexts; and (c) the scarce integration between bibliometric trends and interpretive analyses of her theoretical legacy. To address these limitations, the present study is guided by three research questions: (1) What are the key pedagogical principles proposed by Maria Montessori that align with the Active School movement? In what ways do Montessori's ideas contribute to the development of early childhood education within the framework of active pedagogy? (3) How do these contributions remain pertinent to the educational challenges of the twenty-first century?

By responding to these questions, this review aims to bridge existing gaps in the literature and to offer an updated, systematic understanding of Montessori's legacy and its implications for contemporary pedagogical theory and practice. The study not only integrates a bibliometric analysis—conducted through VOSviewer and based on reliable, indexed academic sources such as Web of Science, Scopus, SCIELO, EBSCO, REDALYC, and ERIH Plus—but also advances a hermeneutic interpretation that complements the quantitative mapping. This dual approach informs both the presentation of results and the subsequent discussion (Sections 4 and 5), where additional data extend the literature review to provide a deeper, evidence-based, and interpretively grounded reassessment of Montessori's contributions to the Active School and early childhood education.

3. Methodology

The study used a systematic, qualitative, and interpretive approach to reviewing scientific literature, with a documentary and hermeneutic research design. This combination allows for both the empirical rigor of systematic and bibliometric analysis and the interpretative depth of

hermeneutic inquiry, ensuring a comprehensive understanding of the educational meanings embedded in the analyzed sources.

For this purpose, a structured, step-by-step review process was followed, and the PRISMA flow diagram (Lombaers, de Bruin, & van de Schoot, 2024) was used to visually represent it. According to recent studies (Segooa, Modiba, & Motjoloane, 2025; Castillo-Martínez et al., 2024), this procedure typically comprises four stages: identification, screening, eligibility, and inclusion. These stages allow for the selection of relevant works and the extraction of pertinent content for the overall analysis (Salih et al., 2025) (see Figure 1).

Within this framework, the hermeneutic design refers to a methodological approach that emphasizes interpretation over mere description. It seeks to uncover the pedagogical, conceptual, and epistemological dimensions of Maria Montessori’s contributions within the broader context of the Active School movement. In this study, hermeneutics is understood as a dialogical process of interpretation between the researcher and the texts, in which meaning is reconstructed through iterative reading, thematic coding, and contextual analysis. This approach aligns with the perspectives of Gadamer (2013) and Ricoeur (1970), who view understanding as an interpretive act that situates textual meaning within its historical and philosophical context.

Moreover, to complement the qualitative interpretation with quantitative insight, a bibliometric analysis was performed using VOSviewer software (version 1.6.19). This tool facilitated the visualization of co-occurrence networks, the detection of keyword clusters, and the identification of thematic and citation patterns among the selected publications. The integration of systematic and bibliometric methods provides greater analytical robustness and aligns with current trends in mixed-methods educational research.

Therefore, the study can be more precisely characterized as a systematic-bibliometric review with a hermeneutic interpretative component, rather than as a purely qualitative investigation. This dual structure strengthens methodological transparency, enhances analytical depth, and ensures the reproducibility of the findings.

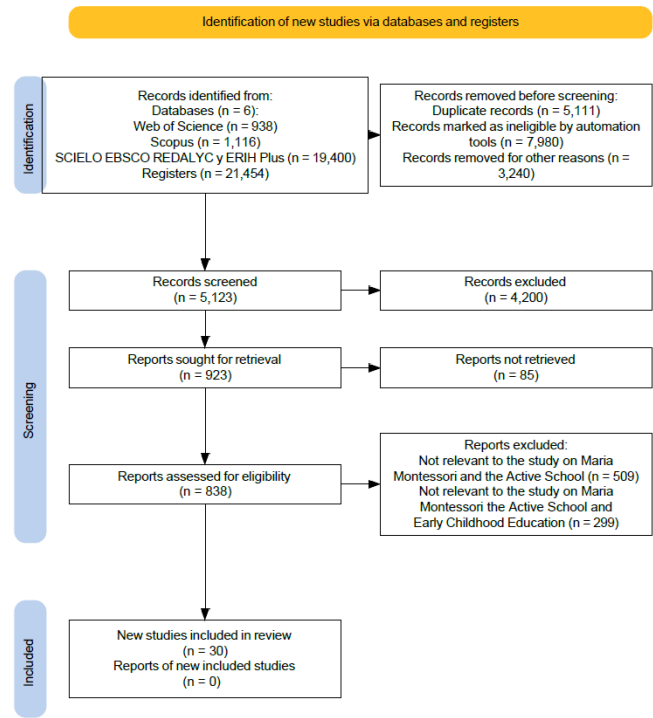


Figure 1. Process of identification, screening and selection of studies (PRISMA)

In the identification phase, six databases were consulted: Web of Science, Scopus, SCIELO, EBSCO, REDALYC, and ERIH Plus. In Web of Science, the search using the keyword “Montessori” yielded a total of ($n = 938$) records. The strategy was subsequently refined by applying thematic criteria such as Education and Educational Research, which reduced the results to 238. A second refinement, using Meso citation topics specifically in the categories of Education, Educational Research, and Philosophy, resulted in 59 highly relevant documents. In Scopus, the initial search with the term “Montessori” retrieved ($n = 1116$) records. These results were further filtered by subject area (Social Sciences and Arts), keywords (Montessori, Education, Maria Montessori, Montessori Education, Montessori Method, Pedagogy, Montessori Pedagogy, and Children), and language (English, $n = 204$; Spanish, $n = 2$). After applying these filters, a total of 204 articles were included. In the case of SCIELO, EBSCO, REDALYC, and ERIH Plus, initially accessed through Google Scholar, ($n = 19,400$) records were identified. From this set, 5111 duplicates were excluded, along with 7980 records addressing very general aspects of Montessori unrelated to the focus of this study, and 3240 excluded for methodological reasons, resulting in a more refined dataset.

During the screening phase, accessible records were examined ($n = 5123$), of which 4200 were excluded for not corresponding to the article type.

In the retrieval phase, the remaining records ($n = 923$) were assessed, with 85 excluded due to the unavailability of the full text.

In the eligibility phase, ($n = 838$) articles were evaluated in detail, and an additional exclusion criterion was applied. A total of 509 records were excluded as not relevant to Maria Montessori and the Active School, and 299 were excluded as not relevant to Maria Montessori, the Active School, and Early Childhood Education.

Finally, in the inclusion phase, the final set of documents incorporated into the review consisted of 30 articles. These documents were analyzed through two complementary strategies: (a) bibliometric mapping using VOSviewer to identify clusters, trends, and co-occurrence patterns; and (b) hermeneutic interpretation of the selected texts, focusing on conceptual meanings, philosophical foundations, and educational implications. This integration of analytical and interpretative dimensions ensures both empirical precision and epistemological depth, reinforcing the validity of the study’s findings.

3.1. Methodological Integration, Analytical Coherence, and Validity

This study adopts a dual methodological strategy that integrates systematic and hermeneutic analysis, enabling both the quantitative mapping of scientific production and the interpretative exploration of its conceptual depth. The systematic component, guided by the PRISMA protocol, ensures transparency, rigor, and reproducibility by adhering to standardized stages of identification, screening, eligibility, and inclusion. This process guarantees that the corpus selected for interpretation is the result of an exhaustive and verifiable search across high-quality academic databases (Web of Science, Scopus, SCIELO, EBSCO, REDALYC, and ERIH Plus), rather than an arbitrary selection.

The bibliometric dimension was fundamental for characterizing the scientific landscape surrounding Maria Montessori’s contributions to the Active School and Early Childhood Education. Using VOSviewer software (version 1.6.19), the analysis visualized co-occurrence networks, thematic clusters, and interconnections among key concepts, authors, and institutions. These patterns provided an empirical foundation that informed and supported the interpretative phase. Accordingly, the systematic and bibliometric components functioned as the structural basis for data organization, while the hermeneutic design offered the interpretative framework through which meaning was constructed.

The hermeneutic approach—rooted in the philosophical traditions of Hans-Georg Gadamer (2006) and Paul Ricoeur (1991)—posits that understanding a text extends beyond reproducing its content. It entails an interpretative dialogue between the researcher and the text, mediated by preconceptions, historical contexts, and the theoretical frameworks that shape comprehension. Within this study, hermeneutics moves beyond a descriptive reading of Montessori's work to uncover the pedagogical meanings, values, and epistemological implications underpinning her educational philosophy within the context of the Active School movement.

Methodologically, the hermeneutic phase unfolded in three stages:

(1) Textual immersion, involving repeated reading and annotation of selected documents to identify recurrent pedagogical concepts and metaphors.

(2) Interpretative synthesis, through which thematic patterns related to Montessori's theoretical assumptions and the broader discourse of progressive pedagogy are presented; and

(3) Contextual reconstruction, where extracted meanings were contrasted with contemporary educational paradigms to evaluate their continuing relevance.

By integrating systematic, bibliometric, and hermeneutic approaches, this study bridges quantitative rigor with qualitative depth. The systematic review ensures methodological transparency; bibliometric mapping reveals the structural tendencies of Montessori-related research; and hermeneutic analysis interprets the underlying pedagogical meanings. This triangulation strengthens the internal validity of the findings and aligns with current standards in mixed-method educational research (Snyder, 2019; Xiao & Watson, 2019).

Accordingly, the methodological design can be defined as a Systematic–Hermeneutic Review, combining the empirical precision of systematic and bibliometric methods with the interpretative richness of hermeneutic inquiry. This integration ensures methodological coherence, epistemological transparency, and analytical validity—meeting the standards of rigor and reproducibility required in high-impact academic research.

3.2. Methodological Validity and Reliability

The validity of this study derives from the internal coherence among its systematic, bibliometric, and hermeneutic components. Each methodological layer fulfills a complementary function: the systematic review ensures transparency and reproducibility in corpus selection; the bibliometric analysis provides empirical robustness through the visualization of research trends; and the hermeneutic interpretation contributes epistemological depth and theoretical consistency. This triangulated structure minimizes researcher bias and enhances the interpretative credibility of the findings.

Reliability was strengthened through meticulous documentation of every analytical stage, following the PRISMA protocol and the bibliometric standards recommended by recent methodological scholarship (Segooa, Modiba, & Motjoloane, 2025; Castillo-Martínez et al., 2024). All inclusion and exclusion criteria were explicitly defined and consistently applied across databases to ensure procedural transparency. Furthermore, the hermeneutic phase incorporated an iterative validation process involving multiple readings and cross-verification of thematic codes to confirm interpretative stability.

Integrating quantitative and qualitative evidence within a coherent epistemological framework contributes to the level of methodological rigor expected in high-impact educational research. This ensures that the conclusions drawn from the analysis of Montessori's contributions to the Active School and Early Childhood Education are both empirically grounded and theoretically substantiated, enabling the study to serve as a replicable and credible reference for future investigations in the field.

4. Results

As this is a qualitative study based on a hermeneutic approach, no statistical data or quantitative analyses were employed. Instead, the findings are grounded in a critical discussion and interpretation of Montessori's educational thought, which is recognized as a fundamental figure in the Modern School movement. The research is guided by identifying, through systematic and interpretative analysis, Maria Montessori's key contributions to the Active School and Early Childhood Education.

In addition to the analyses presented in the selection of bibliographic sources described in the methodological section—where a bibliometric study was conducted through the PRISMA protocol—the results are organized into two complementary analytical phases. The first corresponds to the bibliometric and systematic dimension, which identifies structural patterns and research trends in literature. In contrast, the second phase corresponds to the hermeneutic interpretation, which contextualizes and explains the conceptual meaning of Montessori's ideas within contemporary educational discourse.

4.1. Bibliometric and Systematic Results

The first phase of results is derived from an exhaustive review of reliable sources and indexed academic journals, including Web of Science, Scopus, SCIELO, EBSCO, REDALYC, and ERIH Plus. From the reading of the articles retrieved in Web of Science, the keyword search “Montessori” yielded a total of ($n = 938$). From these, the relevant content necessary for the study was extracted to present results that would support a rigorous analysis across different fields of knowledge. Initially, a relationship among keywords is displayed as a term recurrence map using VOS viewer 1.6.20, identifying the body of work in the Web of Science knowledge base as the point of departure as of 01-09-2025 (see Figure 2).

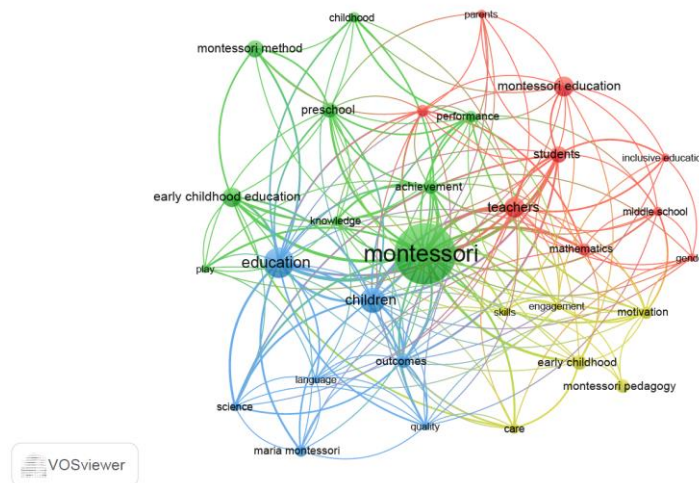


Figure 2. Co-occurrence map of keywords on “Montessori” in the Web of Science database

The figure presents a keyword co-occurrence map generated with VOSviewer, which visualizes the frequency and connections among terms in the literature on Montessori. The central node “Montessori” shows the highest presence and articulates various thematic clusters. While core areas related to early childhood education, pedagogy, and academic performance are identified, other axes not strictly educational also emerge, such as motivation, gender, and care. These connections indicate that Montessori's influence transcends the classroom setting, revealing her method's interdisciplinary expansion into psychology, sociology, and health-related education. This broad scope demonstrates that Montessori's legacy operates as a pedagogical paradigm that integrates cognitive, affective, and social dimensions.

In this context, the strategy was refined through the application of thematic criteria in Education and Educational Research, which reduced the results to 238 documents. Subsequently, a second refinement, based on the Meso citation topics within the categories of Education, Educational Research, and Philosophy, allowed for the selection of 59 documents of greater relevance.

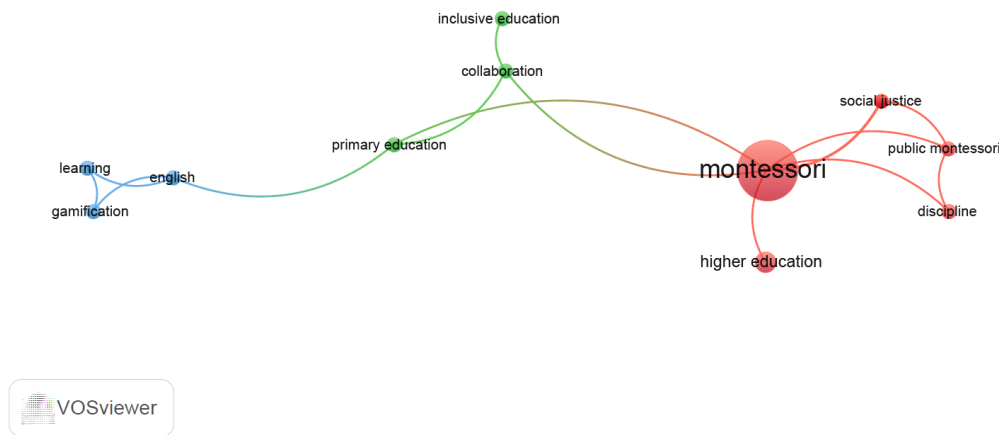


Figure 3. Co-occurrence map of keywords in studies on Montessori and emerging educational domains

The figure presents a keyword co-occurrence map generated with VOSviewer, where “Montessori” appears as the central articulating node. The clusters reveal connections with higher education, social justice, and discipline, as well as with approaches to inclusive education and collaboration. This visualization shows how the Montessori method has evolved into an adaptable model capable of responding to contemporary issues such as equity, diversity, and inclusive pedagogical practices. The inclusion of terms like “social justice” and “collaboration” signals a conceptual continuity between Montessori’s principles and modern educational reforms.

Regarding Scopus, the initial search using the term “Montessori” yielded n = 1116 records. Relevant content was extracted to support the study with the aim of presenting results that enable a rigorous analysis across various fields of knowledge. To this end, a recurrence map of terms was first generated using VOSviewer 1.6.20, which identifies the body of works within the Web of Science knowledge base, taking September 1, 2025, as the point of reference (see Figure 4).

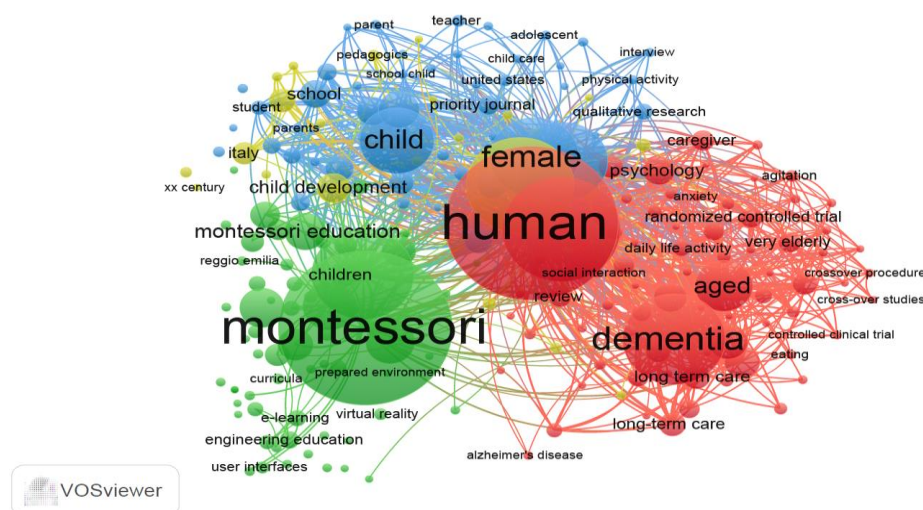


Figure 4. Network of Co-occurrence of Key Terms on the Montessori Method and Its Areas of Application

Figure 4 illustrates the co-occurrence of key terms in scientific literature, identifying three main thematic clusters. These include the Montessori method (green), education and child development (blue), and studies on dementia and elderly care (red). The connections among clusters reveal that research on Montessori education is linked not only to child development but also to the care of older adults with dementia. This unexpected extension of the Montessori approach to gerontology highlights the transferability of its principles—such as autonomy, sensory engagement, and environmental adaptation—to diverse human developmental contexts.

Nevertheless, the results were subjected to a filtering process considering the thematic scope (Social Sciences and Arts), the relevant keywords (Montessori, Education, Maria Montessori, Montessori Education, Montessori Method, Pedagogy, Montessori Pedagogy, and Children), and the language of publication (English, $n = 204$; Spanish, $n = 2$). Following the application of these criteria, a total of 204 articles were selected for analysis.

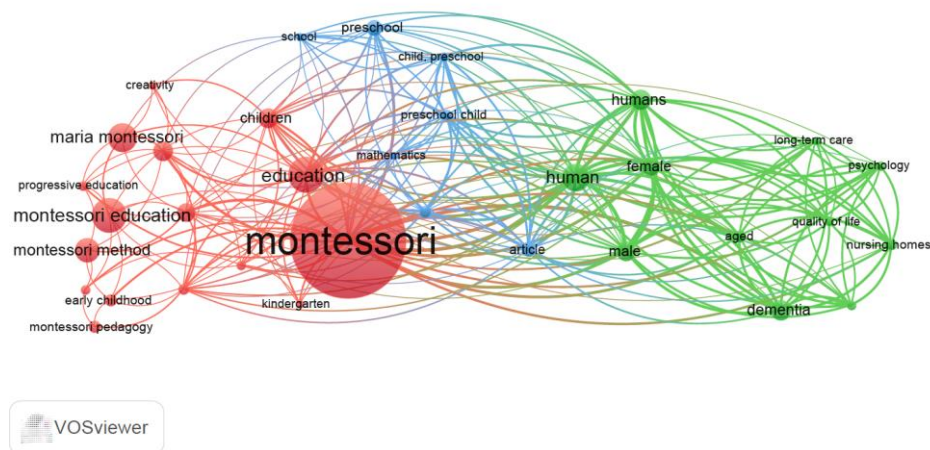


Figure 5. Co-occurrence map of keywords in scholarly research on Montessori, generated with VOSviewer

The figure indicates that Montessori pedagogy maintains a direct yet limited connection with the tradition of the active school, as evidenced by the co-occurrence of the term progressive education within the red cluster. This relationship suggests that Montessori's work operates as both a precursor and a parallel development to the broader Active School movement. While Montessori emphasized autonomy and observation, the Active School focused on participation and collaboration; the overlapping keywords reveal a shared commitment to experiential learning and holistic child development.

4.2. Corpus Refinement and Thematic Structure

Regarding the results obtained from the inclusion and exclusion criteria, the document selection process was carried out with strict rigor, ensuring the relevance and academic quality of the sources. Priority was given to research articles published in peer-reviewed journals in the fields of Education and Social Sciences, indexed in consolidated databases such as SCIELO, EBSCO, REDALYC, and ERIH Plus, thereby guaranteeing their validity and international scope. Conference proceedings, reviews, editorials, and documents without full access or without direct relevance to Montessori and active pedagogy were excluded from the corpus. In this way, the final corpus was adjusted to the thematic axes of the study and served as the basis for analyzing the relevance and contemporary significance of Montessori's educational thought, as summarized in Table 1.

Table 1. Inclusion and exclusion criteria for texts

Inclusion criteria	Exclusion criteria
Research articles published in scientific journals	Conference proceedings
Field of Education or Social Sciences	Reviews, editorials, and non-peer-reviewed documents
Indexed in SciELO, EBSCO, Redalyc and ERIH Plus	Publications without full access or those that do not directly address Montessori, active pedagogy, or early childhood education.

Based on the thematic axis of Montessori, active pedagogy, and early childhood education, the document search was conducted in databases such as SciELO, EBSCO, Redalyc, and ERIH Plus, initially identified through Google Scholar. The selection of sources was aligned with the central aim of this study: to analyze Montessori's contributions to active pedagogy and early childhood education.

In the initial phase, 19,400 records were identified. From this set, 5,111 duplicate documents, 7,980 documents addressing Montessori's work in general without direct relevance to the research objective, and 3,240 documents with methodological limitations were removed, resulting in a more pertinent preliminary corpus.

During the screening phase, 5,123 accessible documents were reviewed, of which 4,200 were excluded for not corresponding to the type of scientific article. In the retrieval phase, 923 studies were analyzed, with 85 discarded due to lack of full-text access.

In the eligibility phase, 838 articles were evaluated by applying an additional criterion of thematic relevance: 509 were excluded for not being relevant to the study on Maria Montessori and the Active School, and 299 were removed for lacking a connection to the research line on Maria Montessori, the Active School, and Early Childhood Education.

Finally, after this refinement process, the corpus was consolidated into 30 articles, selected based on their titles, abstracts, and research scopes. These documents constitute the empirical and documentary foundation for the content analysis, which focused on identifying key words, phrases, sentences, and thematic axes.

Table 2. Results of the search and selection of articles on Montessori, active pedagogy, and early childhood education

Stage of the process	Documents identified / assessed	Documents excluded	Exclusion criteria applied	Remaining corpus
Identification	19,400	5,111	Duplicates	14,289
		7,980	General content, no direct connection with the research focus	6,309
		3,240	Methodological limitations	3,069
Screening	5,123 accessible	4,200	Not scientific articles	923
Eligibility check-in	923	85	Full text not available	838
Eligibility	838	509	Not relevant to <i>Maria Montessori and the Active School</i>	329

Stage of the process	Documents identified / assessed	Documents excluded	Exclusion criteria applied	Remaining corpus
		299	Not related to <i>Montessori, the Active School and Early Childhood Education</i>	30
Final inclusion	—	—	—	30 articles

Table 2 summarizes the systematic and progressive refinement of the bibliographic corpus, evidencing the methodological rigor applied throughout the review process. From an initial identification of 19,400 records, successive exclusion filter-elimination of duplicates ($n = 5,111$), non-relevant documents ($n = 7,980$), and studies with methodological inconsistencies ($n = 3,240$)—narrowed the dataset to 3,069 potentially pertinent sources. The subsequent screening and eligibility phases reinforced this selectivity: only 923 accessible documents met the inclusion criteria for academic validity, of which 85 were excluded due to lack of full-text access. Further thematic assessment confirmed that 509 papers were unrelated to Montessori’s link with the Active School and 299 did not address early childhood education, resulting in a final corpus of 30 high-relevance articles. This rigorous filtration process—consistent with PRISMA standards—ensures analytical transparency, reproducibility, and high validity of the study’s findings. Moreover, the significant reduction from 19,400 to 30 documents underscores both the scarcity of integrated research linking Montessori pedagogy to active education and the originality of the present study, which systematically bridges this gap in the literature.

4.3. Hermeneutic Interpretation and Conceptual Synthesis

In the second phase of the study, the results were interpreted through a hermeneutic approach, which served as the central framework for the analysis. This method proved particularly suitable for examining historical texts, pedagogical works, and discourses within their cultural context, as it enables a profound exploration of meaning—conceived as a dynamic construction among text, context, and interpreter.

The analysis was guided by the hermeneutic circle, moving continuously between the specific elements of Montessori’s texts and the broader theoretical framework of active pedagogy. This iterative process allowed for the identification of conceptual categories that connect Montessori’s original principles with modern pedagogical concerns, such as inclusion, social justice, and cognitive flexibility.

The analysis drew upon the theoretical contributions of Gadamer (2013), Heidegger (2002), Ricoeur (1970), and Dilthey (2002), who emphasize the mediating role of language, the significance of historical horizons, and the active participation of the interpreter in meaning-making. By integrating these philosophical foundations, the study interprets Montessori’s ideas as a living and evolving pedagogical tradition rather than a closed historical model.

From this hermeneutic perspective, it becomes evident that Maria Montessori’s life and work were devoted to childhood and the education of the child, providing enduring and robust foundations for the Active School model and contemporary early childhood education.

4.4. Interpretative Explanation of Hermeneutic Findings

Table 3 presents a synthesis of the hermeneutic analysis, summarizing the conceptual categories, descriptive interpretations, and their direct relationship to the principles of the Active School and early childhood education. Each unit of analysis was extracted from the selected corpus and systematically connected to the philosophical and methodological assumptions identified in

Montessori's work. This synthesis not only organizes the data but also reveals the coherence and evolution of Montessori's thought as a bridge between historical pedagogical theory and contemporary educational paradigms.

Table 3. Hermeneutic Results: Montessori's Contributions to Active Pedagogy and Early Childhood Education

Category / Unit of Analysis	Description	Relation to Active School and Early Childhood Education
Child-Centered Education	An approach that positions the child as the protagonist of their learning, respecting individual rhythms and needs.	Reinforces student action and active participation in the Active School; fosters autonomy, responsibility, and decision-making.
Scientific Pedagogy and Observation	School as a laboratory for research and observation of child development; emphasis on empirical data and dynamic phenomena.	Enables active and contextual understanding of learning; guides teaching through direct experience.
Freedom with Limits	Spaces and activities that allow choice and exploration while respecting basic rules.	Promotes autonomy, self-control, and active learning, central to the Active School.
Prepared Environment	Carefully organized space adapted to the child's abilities and needs.	Facilitates autonomous and contextualized learning, promoting interaction with materials and the environment.
Sensory Pedagogical Materials	Objects designed for manipulation, self-structuring, and self-correction.	Stimulates active learning, concentration, independence, and practical experimentation.
Socialization and Well-Being	Promotion of positive relationships and an environment of joy, respect, and cooperation.	Contributes to holistic development, education for peace, and cooperation in the Active School.
Teacher's Role	Guide, observer, and facilitator of learning, rather than a transmitter of knowledge.	Enhances autonomy, curiosity, and personalized learning, supporting the child's holistic development.
Connection with Emerging Pedagogies	Integration of Montessori principles into contemporary approaches, including neuroscience and inclusive education.	Supports the adaptation of active pedagogy to current contexts, validating its relevance and applicability.
Respect for Individual Rhythms	Avoid comparisons and external pressures to foster the natural development of each child.	Ensures inclusive, progressive, and meaningful learning aligned with the principles of the Active School.

The interpretative reading of the data presented in Table 3 deepens the understanding of how each conceptual category articulates Montessori's educational philosophy within the broader

framework of active pedagogy. The following analysis expands upon these categories, offering a hermeneutic explanation that connects empirical findings with theoretical meaning.

Child-Centered Education emerges as the foundational axis of Montessori's pedagogy and the central link with active education. It asserts that the educational process must adapt to the child, not the reverse. This principle aligns with the Active School's emphasis on student agency and experiential learning. By positioning the learner as the protagonist of knowledge construction, Montessori anticipated later constructivist theories, which also affirm learning as a self-regulated and meaning-making process.

Scientific Pedagogy and Observation represent the epistemological core of Montessori's method. Observation functions as both a research tool and an ethical act that recognizes the individuality of each child. Montessori transformed the classroom into a space for inquiry, in which the teacher assumes the role of a reflective observer rather than an authoritarian transmitter. This transformation aligns with the Active School's view of education as an experimental and contextual process grounded in experience.

Freedom with Limits and the Prepared Environment articulate what might be called the Montessori paradox: structured freedom. The coexistence of autonomy and order allows students to develop self-control and responsibility through meaningful activity. The prepared environment, designed according to the child's developmental needs, provides the material and symbolic structure that makes freedom possible. This idea resonates with Dewey's and Decroly's visions of active discipline, where learning arises from voluntary engagement within a framework of respect and shared norms.

Sensory Pedagogical Materials express Montessori's conviction that knowledge is constructed through the body and the senses. By engaging in perception, movement, and manipulation, these materials transform abstract ideas into tangible experiences. This notion of embodied cognition anticipated current findings in cognitive neuroscience, which demonstrate that sensory-motor interaction enhances conceptual understanding and memory consolidation.

The Teacher's Role is redefined within this paradigm as that of a guide, facilitator, and companion in the learning process. Far from imposing authority, the teacher orchestrates conditions that stimulate curiosity, initiative, and cooperation. This reconceptualization of the educator's role embodies the ethical shift from control to accompaniment, a transformation that remains essential in today's inclusive and participatory classrooms.

Connection with Emerging Pedagogies reflects the continuing adaptability of Montessori's principles to new educational frontiers. Her ideas resonate with inclusive education, social-emotional learning, and neuroeducation, underscoring the flexibility and enduring relevance of her model. By sitting in freedom, observation, and autonomy at the core of educational design, Montessori prefigured the pedagogical dialogue between traditional humanism and evidence-based innovation that defines 21st-century education.

Therefore, Table 3 functions not merely as a summary of conceptual categories but as a hermeneutic reconstruction of meaning that connects Montessori's original formulations with contemporary educational theory. It clarifies the dynamic relationship between autonomy, environment, and experience, demonstrating how her pedagogical vision continues to shape current discourses on child development, inclusive practice, and humanistic education. In doing so, this section bridges the gap between empirical evidence and theoretical reflection, fulfilling the interpretative purpose of the study and reinforcing its contribution to the ongoing renewal of active pedagogy.

5. Discussion

5.1. Maria Montessori's Contributions to Active School and Early Childhood Education

The New School emerged from the need to transform educational spaces into environments that allowed children to fully develop and acquire the competencies necessary to become engaged citizens. This objective was grounded in clear educational goals, relevant content such as civic education and national history, and the incorporation of active methods that positioned students as protagonists of their learning. Throughout its evolution, the New School exhibited unique characteristics and diverse effects compared to traditional teaching, generating a rich pedagogical debate in which prominent figures participated. Among them, Maria Montessori contributed through her compensatory teaching approach, designed to respect individual learning rhythms and facilitate adaptation to the environment. In both the Active School and Montessori's vision, the principles of democracy and peace became fundamental pillars of educational reform.

The New School, also referred to as the Active School, is founded on the principle that education should promote children's action. Schools are tasked with implementing this principle, fostering the development of psychomotor skills. In this way, teaching and learning are guided by the student's interests, increasing both effectiveness and formative value (Narváez, 2006).

Furthermore, the New School emphasizes children's socialization in a joyful and supportive environment, recognizing that education should aim at holistic development rather than merely transmitting knowledge. Curricular content is structured progressively, moving from concrete and familiar concepts to complex and abstract ones, promoting gradual comprehension.

In this context, and with the aim of addressing the initial research questions, the discussion interprets and contextualizes the findings obtained, clarifying their significance, their relationship to the study's objectives, and their connection to previous research to identify convergences, divergences, and innovative contributions.

What are the key pedagogical principles proposed by Maria Montessori that align with the Active School movement?

The bibliometric and hermeneutic analyses confirm that Montessori's educational philosophy shares foundational principles with the Active School movement—particularly autonomy, freedom within limits, experiential learning, and the centrality of the child. Both frameworks reject rote memorization and authoritarian instruction, emphasizing the learner's self-construction of knowledge through active engagement with the environment instead.

These findings are consistent with the work of Velastegui Tayo (2022), who emphasizes that active education requires direct experience and contextual learning, and with Cardona Granada (2023), who underscores Montessori's vision of the school as a "pedagogical laboratory." Likewise, Catarsi (1995) demonstrates that Montessori's "scientific pedagogy" introduced observation and experimentation into the classroom, redefining the teacher's role from transmitter to guide.

The convergence between Montessori's pedagogy and the Active School resides in their shared epistemological shift—from teaching to learning, from authority to autonomy, and from instruction to exploration. Both perspectives reconceptualized education as an open process of inquiry, experience, and transformation.

In what ways do Montessori's ideas contribute to the development of early childhood education within the framework of active pedagogy?

The hermeneutic synthesis reveals that Montessori's most significant contribution lies in her conceptualization of childhood as an active, creative, and self-organizing phase of human

development. Her principles of “freedom within limits” and the “prepared environment” constitute the structural foundations of modern child-centered education.

These principles anticipate many practices later validated by developmental psychology and neuroscience, which highlight the importance of sensory stimulation, self-directed activity, and cognitive autonomy in early learning (Frierson, 2025; Arapi, 2024). Montessori’s emphasis on observation and respect for individual learning rhythms aligns closely with contemporary approaches such as differentiated instruction and inclusive education.

In this regard, Montessori’s pedagogy functions as a conceptual bridge between classical active education and twenty-first-century pedagogical innovation. As noted by Méndez Reyes and González-Rivera (2025), her framework continues to inform the design of inclusive classrooms, adaptive learning environments, and inquiry-based teaching models. This continuity demonstrates that Montessori’s early twentieth-century insights anticipated current understandings of learning as a holistic, context-sensitive, and self-regulated process.

How do these contributions remain pertinent to the educational challenges of the 21st century?

The enduring relevance of Montessori’s contribution lies in their capacity to address the pedagogical and ethical imperatives of contemporary education, namely inclusion, sustainability, peacebuilding, and digital literacy. Her vision of education as a process of human emancipation aligns with current global efforts to promote transformative, equitable, and socially responsible schooling (Santerini, 2013).

The bibliometric results reinforce this interpretation by revealing a growing association between Montessori’s work and research clusters focused on social justice, emotional intelligence, and collaboration (see Figures 3 and 5). These associations illustrate the expanding interdisciplinary applicability of her pedagogy—from inclusive education to gerontological care (Figure 4)—and underscore its adaptability to diverse social contexts.

Studies such as Bertagna (2018) and Barragán Castrillón (2008) corroborate this interpretation, showing that Montessori’s framework anticipated the epistemological renewal of active learning models by integrating freedom, sensory experience, and autonomy as essential dimensions of human development. This convergence underscores the enduring relevance of Montessori’s thought as both a theoretical foundation and a practical guide for addressing the cognitive, social, and ethical challenges of twenty-first-century education.

By systematically integrating bibliometric evidence and hermeneutic interpretation, this discussion provides a comprehensive and updated understanding of Maria Montessori’s role in the historical and conceptual evolution of active pedagogy. The triangulated analysis reveals that her ideas are not isolated innovations but integral components of a broader intellectual movement that redefined the very meaning of learning, freedom, and human potential. Unlike earlier studies that treated Montessori’s method primarily as a historical case (Catarsi, 1995; Obregón, 2006), this research positions her pedagogy as a dynamic, adaptable framework capable of addressing contemporary educational paradigms such as inclusion, emotional education, and neurodidactics.

By addressing the three guiding research questions, the discussion contextualizes Montessori’s pedagogical principles and demonstrates their sustained relevance within changing educational landscapes. It bridges the gaps identified in previous literature by offering an integrated interpretation of Montessori’s legacy, grounded in both empirical mapping and philosophical reflection, and aligned with current methodological standards in educational research.

6. Conclusion

This study presents a systematic–hermeneutic synthesis that elucidates and contextualizes Maria Montessori’s theoretical and practical contributions to the Active School and Early Childhood Education. By integrating bibliometric mapping with interpretative analysis, it not only revisits Montessori’s historical influence but also demonstrates her enduring relevance as a foundational figure in contemporary pedagogical renewal.

The findings indicate that Montessori’s educational philosophy aligns closely with the central tenets of the Active School, particularly autonomy, experiential learning, and the balance between freedom and structure. Her conception of the prepared environment, the emphasis on scientific observation, and the redefinition of the teacher as a facilitator remain essential principles guiding inclusive, participatory, and child-centered pedagogies.

From a theoretical standpoint, this study advances the field by addressing two key gaps in existing research: (a) the absence of a systematic, evidence-based synthesis situating Montessori within the broader discourse of the Active School, and (b) the lack of hermeneutic analyses capable of interpreting the epistemological and ethical dimensions of her thought. Consequently, this research reinforces the conceptual bridge between Montessori’s early twentieth-century pedagogy and twenty-first-century educational paradigms focused on peace, inclusion, and global citizenship.

The implications extend beyond historical understanding. The hermeneutic interpretation underscores that Montessori’s pedagogy endures as a living and adaptable framework capable of informing present-day educational transformations. Her ideas provide effective responses to current challenges such as personalized learning, technological mediation, and socio-emotional development. By reaffirming the pedagogical value of freedom, curiosity, and self-construction, this study offers a renewed, theoretically grounded perspective for reimagining early childhood education as an active, ethical, and socially engaged process.

7. Suggestion

Derived directly from the empirical and interpretative findings, the following recommendations align explicitly with the three research questions and core outcomes of this study:

1. *Curricular Integration.* Educational systems should embed Montessori’s core principles—freedom within limits, autonomy, and experiential learning—into early childhood and primary education curricula. As this study’s results show, these principles enhance learner agency and align with active, constructivist pedagogies endorsed by current international education frameworks.

2. *Teacher Training and Professional Development.* In line with the findings that highlight the teacher’s role as guide and observer, continuous professional preparation is essential. Training programs should incorporate hermeneutic reflection and classroom-based research to strengthen educators’ interpretive and diagnostic capacities, ensuring they can adapt Montessori principles to diverse sociocultural contexts.

3. *Family and Community Involvement.* The results underscore Montessori’s conception of education as a collaborative ecosystem. Strengthening school–family relationships fosters holistic child development. Joint initiatives—such as workshops, community learning spaces, and participatory projects—can extend Montessori’s approach beyond formal schooling, promoting coherence between academic and non-formal learning environments.

4. *Policy and Institutional Support.* Educational policies should prioritize child-centered models grounded in autonomy, inclusion, and cooperation. The findings confirm that Montessori’s pedagogy nurtures key 21st-century competencies such as adaptability, ethical reasoning, and collaborative

learning. Policymakers are therefore encouraged to support specialized teacher training and to redesign learning environments aligned with these principles.

5. Future Research. Building on this study's methodological contribution, future research should empirically assess the implementation of Montessori-inspired practices across educational levels and cultural settings. Longitudinal and comparative studies could examine the long-term effects of Montessori strategies on autonomy, creativity, and socio-emotional development, thereby reinforcing the interpretative insights advanced in this work.

In summary, this study reaffirms the vitality and contemporary relevance of Montessori's pedagogical legacy while situating it within a renewed epistemological framework that combines systematic rigor with interpretative depth. Its principal contribution lies in offering a coherent and empirically grounded model for understanding and applying Montessori's principles in modern education—one that harmonizes scientific evidence, philosophical reflection, and practical implementation.

Declarations

Author Contributions. The authors affirm that all ideas, data, analyses, and the writing of this article were carried out independently by them. All authors have read and approved the published version of the manuscript.

Conflicts of Interest. The authors declare that they have no conflicts of interest.

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Ethical Approval. This study did not involve experiments with human participants or animals. Nevertheless, the authors confirm that the research was conducted in full compliance with academic integrity and ethical research standards. All sources have been properly cited. No personal data or confidential information was used; therefore, ethical committee approval was not required.

Given the hermeneutic and qualitative nature of the study, ethical principles were rigorously observed throughout the textual analysis process. The interpretation was conducted with full respect for the original context and meaning of the authors cited, avoiding distortions or decontextualization of ideas. Special attention was devoted to preventing plagiarism or misappropriation of concepts. The interpretive process sought to maintain fidelity to the original texts while providing a critical and reflective analysis consistent with established standards of qualitative and hermeneutic inquiry.

Originality Statement. The authors declare that this manuscript is an original work, has not been published previously, and is not under consideration for publication elsewhere. All content results from the authors' independent intellectual effort.

Data Availability Statement. Data supporting this study is available from the corresponding author upon reasonable request.

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