

How to Cite:

Nga, T. T. Q., Hong, N. T. A., & Lan, P. T. N. (2026). Fostering Montessori-oriented educational innovation from preschool to lower secondary education. *Tennessee Research International of Social Sciences*, 8(1), 233–244. Retrieved from <https://triss.org/index.php/journal/article/view/149>

Fostering Montessori-oriented educational innovation from preschool to lower secondary education

Truong Thi Quynh Nga

Hoa Moc Lan Kindergarten, Bo De Ward, Hanoi City, Vietnam

Nguyen Thi Anh Hong

Sai Dong Urban Kindergarten, Hanoi City, Vietnam

Pham Thi Ngoc Lan

Minh Khai Lower Secondary School, Hanoi, Vietnam

Abstract--Montessori-oriented educational innovation has attracted increasing attention in contemporary education because of its emphasis on learner-centered instruction, experiential learning, and holistic learner development. This study explores Montessori-oriented educational innovation from preschool to lower secondary education through a qualitative documentary research approach. The research relied on secondary data collected from academic books, peer-reviewed journal articles, conference proceedings, and official educational documents indexed in Scopus and Web of Science. The findings indicate that Montessori pedagogy contributes positively to learners' independence, creativity, collaboration, problem-solving ability, and active participation in learning processes. The study also highlights the important role of teacher professional competence, prepared learning environments, and flexible instructional practices in implementing Montessori-oriented education effectively. In the Vietnamese context, the findings suggest that Montessori-oriented educational innovation aligns closely with current competency-based educational reform and learner-centered teaching approaches. However, challenges related to teacher training, educational resources, classroom organization, and examination-oriented practices continue to affect implementation. The study provides several implications for promoting learner-centered educational innovation and improving educational quality across different educational levels in Vietnam.



Keywords---Montessori education, educational innovation, learner-centered pedagogy, experiential learning, teacher competence, lower secondary education.

1. Introduction

Educational innovation has become an important priority in modern education systems as schools seek to respond to rapid social, technological, and pedagogical changes. In recent years, educational reforms around the world have increasingly emphasized learner-centered approaches that encourage independence, creativity, collaboration, and experiential learning rather than passive knowledge acquisition. In Vietnam, educational innovation has also promoted competency-based teaching and active learning approaches across different educational levels, from preschool to lower secondary education. Within this context, Montessori education has attracted growing attention because of its emphasis on self-directed learning, prepared learning environments, and individualized educational experiences.

Developed by Maria Montessori, the Montessori approach is grounded in the belief that learners develop most effectively through active exploration and interaction within carefully prepared educational environments. Montessori pedagogy emphasizes autonomy, hands-on learning, observation, and experiential activities that support learners' cognitive, emotional, and social development. Rather than functioning primarily as direct instructors, Montessori teachers act as facilitators and guides who support learners according to their developmental needs and interests. Although Montessori education is traditionally associated with preschool education, its learner-centered philosophy and experiential learning principles are increasingly considered relevant for broader educational contexts, including primary and lower secondary education.

The growing interest in Montessori-oriented educational innovation has been accompanied by increasing attention to teacher professional competence and pedagogical transformation. Teachers implementing Montessori-oriented approaches are expected to possess competencies related to observation, classroom organization, communication, reflective practice, and learner-centered instructional design. Montessori-oriented educational practices require teachers not only to understand Montessori philosophy but also to create flexible learning environments that encourage learners' independence, creativity, collaboration, and intrinsic motivation. According to Macià-Gual and Domingo-Peñafiel (2021), the quality of Montessori education is strongly associated with teachers' professional preparedness and their ability to organize child-centered and experiential learning environments.

Research conducted in different educational contexts has demonstrated the positive influence of Montessori education on learners' academic achievement, cognitive development, social competence, and emotional regulation. Courtier et al. (2021) found that Montessori educational programs contribute positively to learners' academic and social development. Similarly, İman et al. (2019) reported that Montessori learning environments support emotional regulation and

collaborative interaction among children. These findings suggest that Montessori pedagogy provides meaningful educational benefits when implemented effectively within learner-centered educational settings.

In addition, contemporary educational innovation increasingly requires teachers at different educational levels to become adaptive, reflective, and collaborative professionals capable of responding to diverse learner needs and changing educational expectations. Montessori-oriented educational practices support these goals by encouraging experiential learning, individualized instruction, active learner participation, and reflective teaching methods. Çakır and Yalçın (2022) also emphasized that Montessori-based educational activities contribute positively to lifelong learning tendencies and professional adaptability among educators.

Despite the educational advantages associated with Montessori pedagogy, its implementation still faces several challenges in many educational contexts. Schools may experience difficulties related to insufficient teacher training, limited Montessori learning materials, lack of institutional support, and incompatibility between Montessori principles and conventional curriculum structures. In lower secondary education, examination-oriented teaching approaches and large class sizes may further limit opportunities for individualized and experiential learning practices. Such challenges highlight the need for further investigation into Montessori-oriented educational innovation across different educational levels.

Therefore, this study aims to explore Montessori-oriented educational innovation from preschool to lower secondary education through documentary research and literature analysis. By reviewing previous academic studies and educational documents, the study seeks to clarify theoretical perspectives, identify innovative pedagogical practices, examine teacher professional competencies, and analyze challenges associated with implementing Montessori-oriented educational approaches in contemporary educational contexts.

2. Literature Review

2.1. Montessori Education and Learner-Centered Pedagogy

Montessori education is widely recognized as one of the most influential learner-centered educational approaches in modern education. Developed by Maria Montessori in the early twentieth century, this pedagogical model emphasizes independence, active exploration, experiential learning, and self-directed participation within carefully prepared educational environments. Unlike traditional teacher-centered instruction, Montessori education encourages learners to develop knowledge and skills through hands-on activities, observation, collaboration, and individual choice. Although Montessori education is most commonly associated with preschool education, its learner-centered philosophy has increasingly been applied across broader educational contexts, including primary and lower secondary education.



Figure 1. Montessori-Oriented Learner-Centered Activities in Vietnamese Educational Settings

Several studies have highlighted the educational value of Montessori pedagogy for learners' cognitive, social, and emotional development. Lillard (2012, 2017) demonstrated that learners educated in Montessori environments often show stronger academic performance, improved executive functioning, and greater social competence compared with learners in conventional educational settings. Similarly, Courtier et al. (2021) found that Montessori education positively affects academic achievement, cognitive development, and social interaction among disadvantaged learners. These findings suggest that Montessori learning environments provide meaningful opportunities for holistic learner development across educational levels.

Research has also emphasized the importance of the prepared learning environment as a core element of Montessori pedagogy. According to Macià-Gual and Domingo-Peñafiel (2021), Montessori classrooms are intentionally organized to encourage independence, concentration, and self-regulation through accessible learning materials and flexible learning spaces. In such environments, learners are allowed to progress according to their developmental readiness and interests, which supports intrinsic motivation and active participation in learning activities.

Furthermore, Montessori education has increasingly been associated with twenty-first-century educational priorities such as creativity, critical thinking, collaboration, and experiential learning. Montessori-oriented learning activities encourage learners to investigate, manipulate materials, solve problems, and participate actively in educational processes. Consequently, Montessori pedagogy is often viewed as compatible with contemporary educational innovation and competency-based educational reform.

2.2. Teacher Professional Competence in Montessori-Oriented Education

The effectiveness of Montessori-oriented educational innovation depends significantly on teachers' professional competence. Teachers implementing Montessori approaches are expected to possess not only pedagogical knowledge but also competencies related to observation, classroom preparation,

individualized instruction, learner guidance, and reflective practice. Unlike conventional teacher-centered instruction, Montessori-oriented teaching emphasizes facilitation, learner autonomy, and experiential learning processes.

Several studies have highlighted the importance of teacher preparation and professional training in Montessori education. Efe and Ulutas (2022) argued that Montessori-oriented teachers require strong observational and reflective skills in order to respond effectively to learners' developmental needs. Teachers must also understand how to organize learning environments, select appropriate learning materials, and encourage learner independence without excessive instructional control. These competencies require continuous professional learning and practical teaching experience.

Research also suggests that Montessori-oriented professional development contributes positively to teachers' instructional flexibility and pedagogical creativity. Teachers working within Montessori-oriented environments are encouraged to adapt instructional strategies according to learners' interests, readiness, and learning progress. Fadhilah and Supriyanto (2023) emphasized that supervision and professional support are essential for maintaining educational quality in Montessori-based educational settings. Continuous professional learning therefore becomes an important condition for effective Montessori implementation.

Another important issue identified in the literature concerns teachers' reflective practice and professional identity. Montessori pedagogy encourages teachers to reconsider traditional authority-centered instructional models and adopt more collaborative and learner-centered educational relationships. This transformation requires teachers to develop patience, communication skills, adaptability, and the ability to support independent learning processes. Consequently, Montessori-oriented professional competence extends beyond technical teaching skills to include educational philosophy and professional attitudes.

2.3. Educational Innovation and Montessori-Oriented Teaching Practices

Educational innovation has created new expectations for teachers across different educational levels. Teachers are increasingly expected to integrate creativity, collaboration, experiential learning, and learner-centered pedagogies into classroom practice. Within this context, Montessori-oriented educational innovation has become increasingly relevant because it supports many competencies associated with modern education.

The reviewed studies indicate that Montessori pedagogy encourages innovative instructional approaches that differ substantially from traditional classroom teaching. Montessori-oriented teachers organize flexible learning environments where learners actively engage in exploration, experimentation, collaboration, and reflective learning activities. Such educational environments support the development of independence, creativity, communication skills, and problem-solving competence among learners. Güzeltaş and Türkoğlu (2025) further confirmed through meta-analysis that Montessori educational programs produce positive effects on various aspects of learner development.

Research has also shown that Montessori-oriented professional development contributes to teachers' lifelong learning and adaptability. Çakır and Yalçın (2022) reported that Montessori-based educational activities positively influence teachers' lifelong learning tendencies and openness toward educational innovation. Teachers involved in Montessori-oriented training are more likely to adopt reflective teaching practices, experiment with alternative instructional approaches, and engage in continuous professional improvement.

Moreover, educational innovation increasingly requires collaboration between teachers, educational institutions, and professional organizations. Organizations such as the American Montessori Society have developed accreditation standards, professional guidelines, and teacher training frameworks aimed at improving educational quality and promoting consistent Montessori practices. These initiatives demonstrate the growing institutional recognition of Montessori-oriented educational innovation in modern educational systems.

2.4. Challenges and Research Gaps in Montessori-Oriented Educational Innovation

Although the literature highlights many educational benefits associated with Montessori pedagogy, several challenges continue to affect Montessori-oriented educational innovation. One major challenge concerns the availability and quality of teacher training programs. In many educational contexts, teachers have limited access to formal Montessori certification programs or practical classroom training opportunities. As a result, educators may experience difficulties applying Montessori principles consistently across educational settings.

Another challenge relates to tensions between Montessori philosophy and traditional educational systems. Conventional educational curricula often emphasize standardized instruction, teacher-directed activities, examination-oriented learning, and formal assessment practices, which may conflict with Montessori principles of individualized learning and learner autonomy. Teachers attempting to implement Montessori-oriented approaches may therefore encounter institutional constraints and professional uncertainty.

The literature also indicates that Montessori-oriented education requires considerable material and organizational support. Prepared learning environments, specialized educational materials, and flexible instructional structures may be difficult to maintain in schools with limited financial and institutional resources. Consequently, the quality and consistency of Montessori implementation may vary significantly across educational contexts.

Despite the increasing number of studies on Montessori education, there remains limited research specifically examining Montessori-oriented educational innovation across multiple educational levels from preschool to lower secondary education. Existing studies frequently focus on children's developmental outcomes in preschool settings while giving less attention to broader pedagogical innovation, teacher adaptability, and learner-centered transformation in later educational stages. Furthermore, limited research has synthesized how Montessori pedagogy contributes to educational innovation and professional transformation within contemporary educational environments.

This study addresses these gaps by reviewing and synthesizing recent literature on Montessori-oriented educational innovation from preschool to lower secondary education. The study focuses particularly on the relationship between Montessori pedagogy, teacher professional competence, learner-centered teaching practices, and educational innovation in contemporary educational contexts.

3. Methodology

This study employed a qualitative documentary research approach to examine Montessori-oriented educational innovation from preschool to lower secondary education. The research relied on secondary data collected from academic books, peer-reviewed journal articles, conference proceedings, and official educational documents related to Montessori pedagogy, learner-centered teaching, teacher professional competence, and educational innovation. Most of the selected publications were indexed in Scopus and Web of Science to ensure academic quality and reliability.

The study was conducted through several stages. First, academic databases were searched using keywords such as “Montessori education,” “educational innovation,” “learner-centered teaching,” and “teacher professional competence.” The review mainly focused on studies published between 2011 and 2025.

After the collection process, the selected materials were screened according to relevance and scholarly contribution. The documents were then analyzed using qualitative content analysis to identify recurring concepts, pedagogical practices, professional competencies, and implementation challenges related to Montessori-oriented educational innovation. Finally, the findings were synthesized into major themes concerning Montessori pedagogy, teacher competence, learner-centered instruction, and educational innovation across different educational levels.

4. Findings

4.1. Montessori Pedagogy and Learner-Centered Educational Innovation

The reviewed studies consistently show that Montessori education supports learner-centered and experiential learning across different educational levels. Montessori-oriented classrooms encourage learners to participate actively in learning activities, develop independence, strengthen collaboration, and improve problem-solving abilities. Research findings indicate that Montessori pedagogy positively influences academic achievement, cognitive development, creativity, and social interaction.

The literature also emphasizes that prepared learning environments are central to Montessori-oriented educational innovation. Flexible classroom organization, accessible learning materials, and individualized instructional approaches help learners develop autonomy, concentration, and intrinsic motivation. These characteristics support active participation and self-directed learning in both preschool and lower secondary educational contexts.

Table 1. Major Characteristics of Montessori-Oriented Educational Innovation

Characteristics	Description	Educational Benefits
Learner-centered learning	Learners actively participate in educational activities	Promotes independence and engagement
Prepared environment	Flexible classrooms with accessible materials	Supports self-directed learning
Individualized instruction	Activities adapted to learners' needs and readiness	Encourages personalized learning
Experiential learning	Learning through hands-on activities and exploration	Enhances creativity and problem-solving
Teacher as facilitator	Teachers guide rather than control learning	Strengthens learner autonomy and confidence

4.2. Teacher Competence in Montessori-Oriented Education

The findings demonstrate that Montessori-oriented educational innovation requires teachers to possess professional competencies beyond traditional teaching skills. Teachers are expected to develop strong observation skills, classroom organization competence, reflective practice, communication abilities, and instructional flexibility. Instead of functioning mainly as information providers, teachers act as facilitators who support learners' exploration and self-directed learning processes.

The literature further indicates that Montessori-oriented professional development strengthens teachers' pedagogical creativity and adaptability. Teachers working in Montessori-oriented environments frequently adjust instructional activities according to learners' interests and developmental readiness. Research also highlights the importance of continuous professional learning, collaborative learning communities, and reflective teaching practices in improving Montessori implementation.

Table 2. Professional Competencies in Montessori-Oriented Education

Competencies	Description	Educational Significance
Observation skills	Monitoring learners' behavior and learning progress	Supports individualized instruction
Classroom preparation	Organizing learning environments and materials	Creates effective learning conditions
Reflective practice	Evaluating and improving teaching approaches	Encourages professional growth
Communication skills	Building supportive teacher-learner relationships	Strengthens social and emotional development
Instructional flexibility	Adapting activities to learners' needs	Enhances learner-centered teaching

4.3. *Montessori-Oriented Educational Innovation and Contemporary Education*

Another important finding is that Montessori-oriented educational innovation aligns closely with contemporary educational reform emphasizing creativity, collaboration, experiential learning, and learner-centered instruction. Montessori pedagogy encourages flexible learning environments where learners actively engage in exploration, experimentation, communication, and collaborative activities. Such educational practices contribute positively to creativity, critical thinking, and lifelong learning competence.

The literature also indicates that Montessori-oriented educational practices support teachers' openness to innovation and continuous professional improvement. Teachers involved in Montessori training are more likely to adopt reflective teaching strategies and experiment with alternative instructional methods. Furthermore, collaboration among teachers, educational institutions, and professional organizations contributes to stronger professional learning communities and improved educational quality.

4.4. *Challenges in Implementing Montessori-Oriented Educational Innovation*

Despite the educational benefits identified in the literature, several challenges continue to affect Montessori-oriented educational innovation. One major challenge concerns limited access to Montessori teacher training programs and professional certification opportunities. In many educational contexts, teachers experience difficulties obtaining sufficient practical preparation related to Montessori instructional methods and classroom management.

Another challenge involves the compatibility between Montessori philosophy and conventional educational systems. Traditional curriculum structures, examination-oriented teaching, and formal assessment requirements may conflict with Montessori principles emphasizing individualized learning and learner autonomy. Teachers attempting to apply Montessori-oriented approaches may therefore encounter institutional and organizational barriers.

The literature also highlights challenges related to educational resources and institutional support. Montessori-oriented classrooms often require specialized learning materials, flexible learning spaces, and small-group instructional organization, which may be difficult to maintain in schools with limited financial resources. These conditions can affect the consistency and effectiveness of Montessori-oriented educational innovation across different educational levels.

5. Discussion

The findings of this study indicate that Montessori-oriented educational innovation has significant potential for supporting learner-centered education and educational reform in Vietnam. Montessori pedagogy emphasizes independence, experiential learning, creativity, and individualized instruction, which are consistent with the goals of the 2018 General Education Curriculum in Vietnam. Current educational reform in Vietnam increasingly encourages schools to move from knowledge-transmission approaches toward competency-based teaching that

promotes active learning, collaboration, and problem-solving skills among learners.

One important lesson for Vietnam is the need to strengthen learner-centered teaching practices across different educational levels. The reviewed literature shows that Montessori-oriented classrooms encourage learners to participate actively in educational activities rather than passively receiving knowledge from teachers. Such approaches may help Vietnamese schools reduce the limitations of traditional teacher-centered instruction and create more flexible learning environments that support creativity and independent thinking. This is particularly important in lower secondary education, where examination-oriented teaching still strongly influences classroom practices.

Another important issue concerns the changing role of teachers in contemporary education. Montessori-oriented educational innovation requires teachers to become facilitators, observers, and guides instead of functioning mainly as knowledge transmitters. This finding suggests that teacher professional development in Vietnam should place greater emphasis on learner-centered pedagogy, experiential learning methods, classroom interaction, and reflective teaching practices. Continuous professional training is necessary to help teachers adapt to educational innovation and improve their instructional flexibility.

The study also highlights the importance of prepared learning environments and flexible classroom organization. Montessori-oriented education encourages the use of open learning spaces, accessible learning materials, collaborative activities, and individualized learning experiences. For Vietnamese schools, this suggests the need to improve classroom environments and increase opportunities for experiential learning activities, particularly in preschool and lower secondary education. Although financial and institutional limitations may prevent the complete implementation of Montessori models, many learner-centered principles can still be adapted effectively within existing educational conditions.

However, the findings also reveal several challenges that Vietnam needs to address in implementing Montessori-oriented educational innovation. Large class sizes, limited educational resources, insufficient teacher training, and traditional assessment systems may reduce opportunities for individualized and experiential learning approaches. In addition, many schools continue to prioritize examination performance and content coverage, which may conflict with Montessori principles emphasizing learner autonomy and developmental flexibility.

Therefore, an important lesson for Vietnam is that Montessori-oriented educational innovation should not be applied mechanically but adapted according to local educational conditions, curriculum requirements, and learner needs. Educational authorities and schools should encourage gradual implementation of learner-centered teaching approaches, strengthen teacher professional learning communities, and increase institutional support for innovative educational practices. Such efforts may contribute positively to improving educational quality and promoting sustainable educational reform in Vietnam.

6. Conclusion

This study explored Montessori-oriented educational innovation from preschool to lower secondary education through documentary research and literature analysis. The findings demonstrate that Montessori pedagogy contributes positively to learner-centered education by supporting independence, experiential learning, creativity, collaboration, and individualized instruction. Montessori-oriented educational practices also encourage more flexible and reflective teaching approaches that align with contemporary educational reform trends.

The study further indicates that Montessori-oriented educational innovation provides valuable implications for educational development in Vietnam. Learner-centered instruction, experiential learning activities, and supportive classroom environments may help schools improve learners' active participation and competency development. In addition, strengthening teacher professional competence and encouraging reflective teaching practices are important conditions for implementing innovative educational approaches effectively.

At the same time, the study highlights several challenges affecting the application of Montessori-oriented education in Vietnamese schools, including limited educational resources, large class sizes, insufficient teacher preparation, and examination-oriented teaching practices. These issues suggest that educational innovation requires both pedagogical transformation and institutional support in order to achieve sustainable implementation.

References

- Ackerman, D. J. (2019). *The Montessori preschool landscape in the United States: History, programmatic inputs, availability, and effects*. *ETS Research Report Series*, 2019(1), 1–20.
- American Montessori Society. (2023). *School accreditation standards*.
- André Roberfroid, & Helfrich, M. S. (2011). *Montessori learning in the 21st century: A guide for parents and teachers*. NewSage Press.
- Association Montessori de France, & Institut Supérieur Maria Montessori. (2016). *Charte des établissements Montessori de France*.
- Buldur, A., & Gokkus, İ. (2021). *The effect of Montessori education on the development of phonological and print awareness*. *Research in Pedagogy*, 11(1), 264–277.
- Çakır, Z., & Yalçın, S. A. (2022). *The effect of the Montessori approach-based STEM activities on the pre-service teachers' lifelong learning*. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi*, 56, 66–96.
- Courtier, P., et al. (2021). *Effects of Montessori education on the academic, cognitive, and social development of disadvantaged preschoolers*. *Child Development*, 92(5), 2069–2088.
- Eacott, S., Muñoz Rivera, F., Wainer, C., & Raad, A. (2022). *Montessori education in Australian schools*.
- Efe, M., & Ulutas, I. (2022). *Beyond teaching: Montessori education initiatives of public preschool teachers in Turkey*. *Educational Research for Policy and Practice*, 21(3), 375–388.

- Fadhilah, A. N., & Supriyanto, A. (2023). *Teacher supervision strategy in maintaining learning quality in kindergarten using the Montessori method. Education, 4(5), 436–455.*
- Güzeltaş, A., & Türkoğlu, B. (2025). *The effectiveness of Montessori education program in pre-school period: A meta-analysis study. Pegem Journal of Education and Instruction, 15(1), 181–199.*
- İman, E. D., Danişman, Ş., Demircan, Z. A., & Yaya, D. (2019). *The effect of the Montessori method on preschool children's social competence and emotion regulation skills. Early Child Development and Care.*
- Kayili, G., & Ari, R. (2011, 2016). *The effect of the Montessori method on children's readiness and social skills. Educational Sciences: Theory and Practice, 11(4), 2104–2109; Journal of Education and Training Studies, 4(12), 81–91.*
- Kıran, I., Macun, B., Arın, Y., & Ulutaş, İ. (2021). *Montessori method in early childhood education: A systematic review. Çukurova University Faculty of Education Journal, 50(2), 1154–1183.*
- Lillard, A. S. (2012, 2017). *Preschool children's development in Montessori and conventional programs. Journal of School Psychology, 50(3), 379–401; Frontiers in Psychology, 8, 294777.*
- Macià-Gual, A., & Domingo-Peñañiel, L. (2021). *Demands in Early Childhood Education: Montessori pedagogy, prepared environment, and teacher training. International Journal of Research in Education and Science, 7(1), 144–162.**
- Montessori Australia. (2011). *Montessori national curriculum.*
- Randolph, J. J., et al. (2023). *Montessori education's impact on academic and nonacademic outcomes: A systematic review. Campbell Systematic Reviews, 19(3), e1330.*
- Seldin, T. (2017). *How to raise an amazing child the Montessori way.*
- Seldin, T., & Epstein, P. (2003). *The Montessori way.*
- Sezgin, E., & Şener, T. (2024). *An examination of the psychological resilience of preschool children with and without Montessori education. Review of Education, 12(2), e3471.*