

Promoting Scientific Curiosity among Preschool Children in Vietnam: Teachers' Strategies and Classroom Experiences

Received: 11 Aug 2026

Accepted: 24 Sep 2026

Published online: 03 Oct 2026

©2026 by the authors. Licensee IJCRR, India. This is an open access article under the terms and conditions of the Creative Commons Attribution (CC-BY) license

(<https://creativecommons.org/licenses/by/4.0/>).

Nguyen Thi Minh Anh^{1,*}, Tran Quoc Bao²

Abstract

Background: Early childhood education plays an important role in developing children's curiosity, observation skills, creativity, and understanding of the natural environment. Natural sciences education during kindergarten provides opportunities for young learners to explore plants, animals, weather, water, soil, and other elements of their surroundings through practical and play-based activities. In Vietnam, preschool education has undergone curriculum development aimed at improving children's holistic development and learning experiences.

Objective: This article aims to examine the role of natural sciences education in Vietnamese kindergartens, focusing on teachers' perspectives, classroom experiences, teaching challenges, and professional support needs.

Methods: This article adopts a narrative review and conceptual analysis approach. Relevant educational policies, curriculum documents, international reports, and published literature concerning early childhood education and science learning were considered. Particular attention was given to the Vietnamese preschool education curriculum and the professional requirements of kindergarten teachers.

Results: The review highlights the importance of activity-based learning, environmental exploration, observation, questioning, and hands-on experiences in early childhood science education. Potential implementation challenges include limited teaching resources, differences in institutional facilities, classroom management demands, and the need for continuous professional development. Teachers may also require additional support in designing age-appropriate scientific activities and connecting curriculum objectives with children's everyday experiences.

Conclusion: Natural sciences education can contribute significantly to holistic development in Vietnamese kindergartens. Strengthening teacher training, providing appropriate instructional resources, promoting outdoor learning, and encouraging school-family collaboration may help improve the quality of early science learning experiences.

Keywords: Natural Sciences Education, Kindergarten, Preschool Teachers, Vietnam, Early Childhood Education, Teaching Challenges, Professional Development.

¹Department of Early Childhood Education Faculty of Education Vietnam National University, Hanoi Hanoi, Vietnam

²Department of Educational Sciences University of Education Vietnam National University, Ho Chi Minh City Ho Chi Minh City, Vietnam

1. Introduction

Early childhood is a critical period for developing foundational knowledge, cognitive abilities, social skills, and positive attitudes toward learning. During this stage, children naturally demonstrate curiosity about their surroundings and frequently explore the world through observation, questioning, experimentation, and interaction. Natural sciences education provides meaningful opportunities to encourage these abilities and introduce children to basic scientific concepts.

In kindergarten settings, science learning does not necessarily require formal laboratory instruction or complex theoretical explanations. Instead, it can be introduced through simple activities such as observing plant growth, identifying different animals, exploring water and soil, examining weather changes, and understanding the relationship between living organisms and their environments.

Vietnam has established a national preschool education programme through Circular No. 17/2009/TT-BGDĐT, subsequently amended through Circular No. 28/2016/TT-BGDĐT and Circular No. 51/2020/TT-BGDĐT. These policy developments provide an important framework for preschool education and children's comprehensive development.

In the Vietnamese context, natural sciences learning can be connected with children's immediate environments, including gardens, rivers, agricultural landscapes, seasonal weather patterns, local plants, and community life. Such experiences can help children develop environmental awareness and understand basic scientific relationships through direct participation.

Despite the importance of early science education, its classroom implementation may involve several challenges. Teachers need appropriate knowledge, instructional materials, time, and pedagogical strategies to provide meaningful learning experiences. Therefore, understanding teachers' views and professional support requirements is essential for improving science education in Vietnamese kindergartens.

2. Review of Literature

2.1 Natural Sciences Education in Early Childhood

Natural sciences education during early childhood focuses on developing children's curiosity and understanding of the natural world. It introduces

basic concepts related to living organisms, physical materials, environmental changes, and everyday scientific phenomena.

Children learn effectively when they can interact directly with objects and situations. Activities involving observation, comparison, classification, questioning, and simple experimentation encourage early scientific thinking.

2.2 Preschool Education in Vietnam

Vietnam's preschool education system has developed a national curriculum framework intended to support children's physical, cognitive, linguistic, emotional, and social development.

The preschool curriculum established under Circular No. 17/2009 and amended by Circular No. 51/2020 provides the policy context for organizing educational activities in preschool institutions. The curriculum framework is relevant to the integration of environmental exploration and age-appropriate science-related experiences.

UNESCO has also documented Vietnam's efforts to develop updated developmental standards for five-year-old children, emphasizing the importance of appropriate developmental outcomes and monitoring children's progress.

2.3 Teachers' Perspectives on Science Learning

Kindergarten teachers play an important role in introducing scientific ideas through everyday experiences. Their understanding of science education, confidence in conducting practical activities, and ability to encourage children's questions can influence classroom learning.

Teachers may recognize the importance of science exploration but differ in their familiarity with experimental activities, inquiry-based learning, and the integration of science with other educational areas.

2.4 Experiential and Play-Based Learning

Play-based and experiential learning approaches provide opportunities for children to explore scientific concepts in natural and engaging ways.

Examples include:

- Observing the growth of seeds and plants.
- Exploring floating and sinking objects.
- Identifying different leaves and flowers.
- Observing clouds, rain, and sunlight.
- Exploring soil, sand, and water.

- Learning about insects, birds, and domestic animals.

These activities encourage children to develop observation, communication, problem-solving, and early reasoning skills.

3. Objectives of the Study

The main objectives of this article are:

1. To examine the role of natural sciences education in Vietnamese kindergarten settings.
2. To explore teachers' perspectives regarding early science learning.
3. To identify potential classroom experiences and teaching approaches used in natural sciences education.
4. To discuss challenges associated with implementing science-related educational activities.
5. To identify teachers' professional development and institutional support needs.
6. To suggest practical approaches for strengthening natural sciences education in Vietnamese kindergartens.

4. Methodology

This article follows a narrative literature review and conceptual analysis design. It draws upon relevant national curriculum documents, educational policy materials, international education reports, and scholarly discussions concerning early childhood science education.

The Vietnamese preschool education curriculum was considered as the primary national policy framework. International publications from UNESCO and UNICEF were also considered to understand broader developments in early childhood education, teacher preparation, educational quality, and inclusive learning environments.

The review was organized around four major themes:

- Teachers' understanding and perceptions of science education.
- Classroom teaching practices and children's learning experiences.
- Institutional and pedagogical challenges.
- Professional development and support requirements.

No primary survey, interview, classroom observation, or experimental dataset was collected

for this conceptual article. Consequently, the discussion presents literature-informed themes rather than statistical findings from Vietnamese kindergarten teachers.

5. Discussion

5.1 Teachers' Understanding of Natural Sciences Education

Teachers' understanding of natural sciences education is an important element in creating meaningful classroom experiences. Early science education requires teachers to move beyond textbook-based explanations and encourage children to investigate their surroundings.

For example, teachers can introduce the concept of plant growth by allowing children to observe seeds, water them regularly, and compare changes over time. Such activities can make abstract scientific ideas understandable through direct experiences.

In Vietnamese kindergartens, locally available natural materials can provide opportunities for meaningful learning without requiring expensive equipment.

5.2 Classroom Experiences and Teaching Practices

Classroom experiences can include indoor and outdoor activities that encourage children to explore their environment.

Teachers may use storytelling, educational games, nature walks, picture identification, gardening, and simple demonstrations to introduce scientific concepts.

Outdoor learning can be particularly relevant in connecting children with local biodiversity and environmental conditions. Activities involving gardens, trees, insects, rainfall, and seasonal changes can help children understand the relationship between humans and nature.

5.3 Challenges in Teaching Natural Sciences

The implementation of natural sciences education may involve several institutional and pedagogical difficulties.

Limited teaching resources: Some educational institutions may have insufficient scientific learning materials, observation tools, and suitable outdoor facilities.

Teacher preparation: Teachers may require additional training in inquiry-based instruction,

simple experiments, and age-appropriate science activities.

Classroom management: Organizing practical activities with young children requires careful supervision, appropriate safety arrangements, and sufficient preparation time.

Curriculum integration: Teachers may find it challenging to connect scientific exploration with other developmental areas while maintaining meaningful learning objectives.

Regional differences: Educational facilities and access to learning resources may vary between urban, rural, and remote communities in Vietnam.

These issues should be examined through institution-specific research rather than assumed to affect all Vietnamese kindergartens equally.

5.4 Teachers' Professional Support Needs

Professional development can help teachers improve their confidence and instructional abilities in natural sciences education.

Important areas of support may include:

- Practical workshops on early childhood science education.
- Training in activity-based and inquiry-based teaching.
- Development of low-cost instructional materials.
- Guidance on outdoor learning and environmental education.
- Classroom observation and professional mentoring.
- Sharing of effective teaching practices among kindergarten educators.

Institutional support should also include adequate preparation time, accessible educational resources, and opportunities for continuous professional learning.

5.5 The Role of Parents and the Community

Parents and community members can contribute to children's early science learning by encouraging exploration beyond the classroom.

Family activities such as gardening, observing weather changes, identifying local plants, and caring for domestic animals can reinforce classroom learning.

Collaboration between kindergarten teachers, parents, and local communities may create a more

consistent learning environment for young children.

6. Recommendations

Based on the conceptual review, the following recommendations are proposed:

1. **Strengthen teacher training:** Introduce regular professional development programmes focused on early childhood science education.
2. **Promote experiential learning:** Encourage practical activities that allow children to observe, explore, compare, and ask questions.
3. **Improve instructional resources:** Provide affordable and age-appropriate materials for science-related classroom activities.
4. **Encourage outdoor education:** Make appropriate use of school gardens, natural surroundings, and community environments.
5. **Support regional institutions:** Consider the different infrastructure and resource requirements of urban, rural, and remote kindergartens.
6. **Develop collaborative learning:** Encourage communication between teachers, parents, educational administrators, and local communities.
7. **Strengthen educational monitoring:** Evaluate the quality of children's learning experiences through appropriate developmental observations rather than relying exclusively on formal testing.

7. Conclusion

Natural sciences education represents an important component of holistic early childhood development. In Vietnamese kindergartens, opportunities to explore plants, animals, weather, water, soil, and the surrounding environment can help children develop curiosity, observation, communication, and early problem-solving abilities.

The implementation of meaningful science education depends not only on curriculum provisions but also on teachers' knowledge, classroom practices, institutional resources, and professional support.

Strengthening practical teacher training, promoting experiential learning, improving access to instructional materials, and encouraging cooperation between families and educational institutions may contribute to more effective natural sciences education.

Further empirical research involving kindergarten teachers from different geographical regions of Vietnam is needed to investigate their actual experiences, teaching challenges, and professional support requirements.

References

1. Ministry of Education and Training. (2009). *Circular No. 17/2009/TT-BGDĐT: Promulgating the preschool education programme*. Hanoi, Vietnam.
2. Ministry of Education and Training. (2016). *Circular No. 28/2016/TT-BGDĐT: Amending and supplementing the preschool education programme*. Hanoi, Vietnam.
3. Ministry of Education and Training. (2020). *Circular No. 51/2020/TT-BGDĐT: Amending and supplementing the preschool education programme*. Hanoi, Vietnam.
4. UNESCO. (2023). *Developing a new standard set for five-year-old child development: Enhancing early education in Vietnam*. UNESCO.
5. Ramanathan, G., Carter, D., & Wenner, J. (2022). A framework for scientific inquiry in preschool. *Early Childhood Education Journal*, 50, 1263–1277. <https://doi.org/10.1007/s10643-021-01259-1>
6. Gomes, J., & Fleer, M. (2020). Is science really everywhere? Teachers' perspectives on science learning possibilities in the preschool environment. *Research in Science Education*, 50, 1961–1989.
7. Schlembach, S., Kochanowski, L., Brown, R. D., & Carr, V. (2018). Early childhood educators' perceptions of play and inquiry on a nature playscape. *Children, Youth and Environments*, 28(2), 82–101. <https://doi.org/10.7721/chilyoutenvi.28.2.0082>
8. Prins, J., van der Wilt, F., van der Veen, C., & Hovinga, D. (2022). Nature play in early childhood education: A systematic review and meta-ethnography of qualitative research. *Frontiers in Psychology*, 13, 995164.
9. Dankiw, K. A., Kumar, S., Baldock, K. L., & Tsiros, M. D. (2023). Parent and early childhood educator perspectives of unstructured nature play for young children: A qualitative descriptive study. *PLOS ONE*, 18(6), e0286468. <https://doi.org/10.1371/journal.pone.0286468>
10. Henriksson, A., Fridberg, M., & Leden, L. (2026). Preschool educators' attempts to establish intersubjectivity in science-play. *International Journal of Early Childhood*. <https://doi.org/10.1007/s13158-026-00486-0>
11. Henriksson, A., Fridberg, M., & Leden, L. (2024). Preschool teachers' discussions of attempted play-responsive science teaching. *International Journal of Science Education*. <https://doi.org/10.1080/09500693.2024.2348187>
12. Andersson, K., & Gullberg, A. (2014). What is science in preschool and what do teachers have to know to empower children? *Cultural Studies of Science Education*, 9(2), 275–296. <https://doi.org/10.1007/s11422-012-9439-6>