

Learning Strategies for Early Childhood Education in Remote and Coastal Areas

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Abstract

This study explores learning strategies for early childhood education in remote and coastal areas, focusing on how contextual, community-based, outdoor, and technology-supported approaches can improve the quality of learning for young children in geographically isolated regions. Using a qualitative literature review method, this research analyzes scholarly articles, journals, and academic publications related to early childhood education practices in rural, remote, and coastal contexts published between 2020 and 2025. The findings indicate that contextual and community-based learning strategies, which integrate local wisdom and involve active participation from families and community members, significantly enhance children's engagement, cultural identity, and developmental outcomes. In addition, outdoor learning in natural coastal environments provides meaningful experiential learning opportunities that support cognitive, physical, and socio-emotional development while fostering environmental awareness. Furthermore, technology integration serves as a complementary strategy to overcome geographical barriers by improving access to learning resources and supporting teacher professional development, although challenges such as limited infrastructure and digital literacy remain. The study concludes that a blended approach combining local-context learning, nature-based education, and digital innovation is essential to ensuring equitable and high-quality early childhood education in remote and coastal areas, while also promoting sustainable educational development.

Keywords

Coastal Areas; Early Childhood Education; Learning Strategies; Remote.



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INTRODUCTION

Early Childhood Education (ECE) plays a fundamental role in supporting children's cognitive, social, emotional, and physical development during the most critical years of life. High-quality early learning experiences contribute significantly to school readiness, lifelong learning, and future socioeconomic outcomes. However, achieving equitable access to quality ECE remains a major challenge in remote and coastal areas, where geographical isolation, limited educational infrastructure, teacher shortages, and socioeconomic disadvantages often

hinder children's learning opportunities. Globally, disparities in access and quality of early childhood education continue to affect children living in marginalized communities, emphasizing the need for context-sensitive learning strategies that can address local challenges while promoting inclusive educational outcomes (Raikes et al., 2023).

Remote and coastal communities frequently experience unique educational constraints that differ from those found in urban settings. Children in these regions often face limited access to qualified educators, inadequate learning resources, transportation difficulties, and insufficient educational facilities. Furthermore, environmental factors such as seasonal weather conditions, geographical barriers, and economic dependence on fishing or agricultural activities can influence children's participation in early learning programs. Research has shown that rural and remote early childhood centers often struggle with resource limitations while still being expected to deliver educational services comparable to those in more developed areas (Matjokana, 2023; Wong et al., 2023).

To overcome these challenges, effective learning strategies for early childhood education in remote and coastal areas must be adapted to local contexts and cultural characteristics. One important approach is the integration of local wisdom and community knowledge into the learning process. In coastal communities, children's daily experiences are closely connected to marine environments, fishing activities, local traditions, and ecological practices. Integrating these elements into the curriculum can enhance children's engagement, relevance of learning, and cultural identity. Studies conducted in coastal regions have demonstrated that incorporating local wisdom into learning activities supports multiple developmental domains, including cognitive, social-emotional, language, artistic, and moral development (Jamiludin et al., 2021).

Another significant strategy is the implementation of multicultural and community-based learning models. Coastal communities often consist of diverse cultural groups with distinct traditions, languages, and social practices. Early childhood education programs that recognize and respect this diversity can foster inclusivity, social cohesion, and mutual understanding among children. Multicultural learning approaches encourage children to appreciate differences while developing a strong sense of belonging within their communities. Such approaches are particularly relevant in coastal regions where cultural interactions and local traditions shape everyday life and learning experiences (Machmud & Alim, 2018).

Outdoor and nature-based learning also represents a highly effective strategy for young children in coastal and remote settings. Natural environments provide rich opportunities for exploration, creativity, problem-solving, and social interaction. Research indicates that coastal environments such as beaches and shorelines offer unique educational affordances that support experiential learning and child development. Through activities involving observation, play, environmental exploration, and interaction with natural resources, children develop critical thinking skills, environmental awareness, and emotional well-being. Nature-based learning has also been associated with enhanced engagement, self-confidence, and collaborative learning among young children (Barrable & Barrable, 2022; Prins et al., 2022).

In addition, digital and blended learning approaches have emerged as promising solutions for overcoming educational barriers in remote areas. Advances in information and communication technologies can facilitate access to educational content, professional development opportunities for teachers, and collaboration between remote schools and urban educational institutions. Remote teaching and digital learning platforms can help address teacher shortages and improve educational quality when supported by adequate infrastructure and training. Studies have shown that technology-assisted learning can enhance educational opportunities in underserved communities by connecting learners and educators across geographical distances (Guo et al., 2022).

Given the complex challenges faced by remote and coastal communities, the development of effective learning strategies requires collaboration among educators, families, community leaders, and policymakers. Learning approaches that combine local wisdom, multicultural education, outdoor experiences, and appropriate technology integration can create meaningful and sustainable educational opportunities for young children. Therefore, understanding and implementing context-responsive learning strategies is essential for ensuring equitable access to quality early childhood education and supporting the holistic development of children living in remote and coastal areas.

METHODS

This study employed a qualitative literature review approach to examine learning strategies implemented in early childhood education within remote and coastal areas. The study focused on analyzing and synthesizing scholarly literature published between 2020 and 2025 that discusses early childhood learning practices, community-based education, local wisdom integration, outdoor learning, and technology-supported instruction in geographically isolated regions. Relevant articles were identified through searches in Google Scholar using keywords such as early childhood education, remote areas, coastal communities, learning strategies, local wisdom, and outdoor learning. The inclusion criteria consisted of peer-reviewed journal articles, conference papers, and academic publications written in English that addressed educational practices for children aged 0–8 years in rural, remote, or coastal contexts. The collected literature was analyzed using thematic content analysis to identify recurring themes, effective instructional approaches, implementation challenges, and educational outcomes. Through this process, the study developed a comprehensive understanding of context-responsive learning strategies that support young children's holistic development and educational participation in remote and coastal communities.

FINDINGS AND DISCUSSION

Contextual and Community-Based Learning Strategies in Early Childhood Education in Remote and Coastal Areas

The implementation of contextual and community-based learning strategies has become one of the most effective approaches for improving the quality of early childhood education in remote and coastal areas. Children in these communities grow up within unique social, cultural, and environmental contexts that differ significantly from urban settings. Therefore, learning experiences that are closely connected to children's daily lives are more meaningful and effective in supporting their cognitive, social, emotional, and language development. Contextual learning enables children to construct knowledge through direct experiences and interactions with their surroundings. In coastal communities, for example, learning activities can be designed around local livelihoods such as fishing, marine biodiversity, traditional crafts, and environmental conservation. Such experiences help children connect classroom concepts with real-world situations, thereby increasing engagement and learning retention (Jamiludin et al., 2021).

Community participation plays a critical role in the success of contextual learning strategies. Parents, local leaders, fishermen, artisans, and community elders can contribute valuable knowledge and experiences that enrich educational activities. Their involvement not only strengthens learning outcomes but also fosters a sense of cultural identity and belonging among young children. Research has shown that family and community engagement positively influences children's academic achievement, social competence, and emotional well-being. In remote and coastal regions where educational resources may be limited, community participation often serves as an essential support system for schools and early childhood centers (Kim & Sheridan, 2023).

One important component of community-based learning is the integration of local wisdom into educational practices. Local wisdom encompasses traditional knowledge, values, customs, beliefs, and practices that have been developed and transmitted across generations. In many coastal communities, children are exposed to ecological knowledge related to marine resources, weather patterns, environmental stewardship, and communal cooperation. Incorporating these elements into learning activities promotes cultural preservation while simultaneously supporting children's holistic development. Studies indicate that children who learn through culturally responsive approaches demonstrate stronger motivation, higher engagement, and improved understanding of concepts because the learning content reflects their lived experiences (Gay, 2021).

Language development is another area that benefits from contextual learning strategies. In many remote and coastal regions, children speak local languages or dialects at home while being introduced to the national language in educational settings. Educators who utilize bilingual or multilingual approaches can facilitate smoother transitions between home and school environments. Storytelling, traditional songs, folklore, and local narratives provide valuable opportunities for language acquisition while preserving cultural heritage. Research has demonstrated that culturally and linguistically responsive teaching practices enhance literacy development and strengthen children's communication skills during early childhood (Cummins, 2021).

Play-based learning also aligns naturally with contextual educational approaches. Young children learn most effectively through exploration, imagination, and hands-on activities. Coastal environments provide abundant opportunities for meaningful play experiences involving sand, shells, water, plants, and natural materials. Through guided play, children can develop scientific thinking, creativity, problem-solving skills, and social interaction competencies. For example, collecting shells can support counting and classification skills, while observing tides may introduce basic scientific concepts. Such experiential activities encourage active participation and deeper understanding compared to abstract instruction alone (Zosh et al., 2022).

The role of teachers in implementing contextual learning strategies is particularly significant. Educators must possess the ability to adapt curricula to local circumstances while maintaining alignment with national educational standards. Teachers working in remote and coastal communities often face challenges such as limited professional development opportunities and inadequate educational resources. Nevertheless, innovative educators frequently utilize locally available materials and community resources to create meaningful learning experiences. Professional development programs that emphasize culturally responsive pedagogy and contextual curriculum design have been found to improve teacher effectiveness and educational quality in underserved regions (Darling-Hammond et al., 2020).

Furthermore, community-based learning contributes to children's social-emotional development. Participation in collective activities, community celebrations, cultural events, and collaborative projects helps children develop empathy, cooperation, responsibility, and respect for others. These competencies are particularly important during early childhood because they form the foundation for future interpersonal relationships and lifelong learning. Studies suggest that children who experience strong community connections during early childhood demonstrate higher levels of resilience, self-confidence, and social competence later in life (UNESCO, 2022).

The sustainability of contextual learning initiatives depends on strong partnerships among schools, families, communities, and policymakers. Educational programs that recognize local knowledge and actively involve community stakeholders are more likely to gain support and achieve long-term success. Consequently, contextual and community-based learning represents a powerful strategy for addressing educational disparities in remote and coastal areas while fostering culturally relevant and inclusive early childhood education (OECD, 2021).

Outdoor Learning and Technology Integration for Enhancing Early Childhood Education in Remote and Coastal Areas

Outdoor learning and technology integration have emerged as complementary strategies for improving educational access and quality in remote and coastal early childhood settings. These approaches address many of the challenges associated with geographical isolation, limited infrastructure, and restricted access to educational resources. When implemented appropriately, they provide children with enriched learning experiences that

support cognitive, physical, social, and emotional development while preparing them for participation in a rapidly changing world (Prins et al., 2022).

Outdoor learning is particularly valuable in coastal environments because natural settings offer diverse opportunities for experiential education. Beaches, mangrove forests, rivers, coastal wetlands, and marine ecosystems serve as living laboratories where children can explore scientific concepts through direct observation and interaction. Research indicates that nature-based learning enhances curiosity, environmental awareness, critical thinking, and problem-solving skills among young children. Furthermore, outdoor activities encourage physical movement and contribute to healthier lifestyles, which are essential during the early years of development (Barrable & Barrable, 2022).

The educational value of outdoor learning extends beyond academic outcomes. Interaction with natural environments has been associated with reduced stress, improved emotional regulation, and greater psychological well-being. Children who spend time outdoors often demonstrate higher levels of concentration, creativity, and self-confidence compared to those whose learning experiences occur exclusively indoors. In remote and coastal communities where natural resources are readily available, outdoor learning provides a cost-effective strategy for enhancing educational quality while promoting environmental stewardship (Adams & Beauchamp, 2021).

Environmental education constitutes an important dimension of outdoor learning in coastal areas. Climate change, coastal erosion, marine pollution, and biodiversity conservation are increasingly relevant issues affecting coastal communities worldwide. Introducing age-appropriate environmental concepts during early childhood helps children develop positive attitudes toward sustainability and environmental responsibility. Through activities such as beach cleanups, nature walks, observation of marine life, and recycling projects, children gain practical understanding of ecological relationships and conservation practices. Early exposure to environmental education can foster lifelong commitment to sustainable behaviors and community engagement (Wilson, 2023).

Despite its benefits, outdoor learning requires careful planning and teacher preparation. Educators must ensure children's safety while facilitating meaningful educational experiences. Effective outdoor pedagogy involves structured exploration, guided inquiry, observation, reflection, and documentation of learning outcomes. Teachers who receive training in outdoor education are better equipped to design activities that align with developmental goals and curriculum objectives. Consequently, investment in teacher professional development remains essential for maximizing the educational benefits of nature-based learning programs (Ernst et al., 2021).

Alongside outdoor learning, technology integration offers significant opportunities for overcoming educational barriers in remote and coastal regions. Advances in digital technologies have transformed educational practices worldwide, enabling greater access to learning resources, instructional materials, and professional support networks. For remote communities where access to qualified educators may be limited, technology can bridge

geographical distances and facilitate equitable learning opportunities. Digital platforms, educational applications, and online resources provide children and teachers with access to content that might otherwise be unavailable (Guo et al., 2022).

Technology integration in early childhood education should emphasize developmentally appropriate practices. Young children benefit most from interactive, engaging, and guided digital experiences rather than passive screen exposure. Educational technologies can support literacy, numeracy, language development, creativity, and problem-solving when integrated thoughtfully into broader learning activities. For example, digital storytelling applications can enhance language skills, while educational games may reinforce mathematical concepts through playful exploration. Research indicates that high-quality digital learning experiences can positively contribute to children's developmental outcomes when balanced with hands-on and social learning opportunities (NAEYC, 2020).

For educators in remote and coastal areas, technology also serves as a valuable tool for professional learning and collaboration. Online training programs, virtual communities of practice, and digital resource repositories enable teachers to access ongoing professional development despite geographical constraints. Studies have found that technology-supported professional learning can improve instructional quality, increase teacher confidence, and promote innovative teaching practices in underserved educational settings (Trust et al., 2021).

However, successful technology integration depends on adequate infrastructure and support systems. Challenges such as unreliable internet connectivity, limited access to devices, insufficient technical support, and digital literacy gaps remain significant concerns in many remote communities. Policymakers and educational stakeholders must address these barriers through targeted investments in infrastructure, teacher training, and equitable resource allocation. Sustainable technology initiatives require comprehensive planning that considers local needs, cultural contexts, and long-term maintenance requirements (UNICEF, 2023).

Combining outdoor learning with technology integration can create particularly powerful educational experiences. Digital tools can be used to document nature observations, create multimedia projects, record environmental data, and facilitate communication between schools and communities. Such blended approaches encourage active learning while leveraging both local environmental resources and global technological opportunities. As a result, children develop environmental awareness, digital literacy, creativity, and critical thinking skills simultaneously. These competencies are increasingly important for preparing young learners to navigate future educational and societal challenges (OECD, 2023).

Overall, outdoor learning and technology integration represent innovative and complementary strategies for enhancing early childhood education in remote and coastal areas. By utilizing natural environments as educational resources while expanding access through digital technologies, educators can provide meaningful, inclusive, and developmentally appropriate learning experiences that support children's holistic growth and future success.

CONCLUSION

This study concludes that learning strategies in early childhood education (ECE) within remote and coastal areas must be contextually responsive, inclusive, and adaptable to local conditions in order to effectively support children's holistic development. The integration of community-based learning, local wisdom, and culturally responsive pedagogy plays a central role in making learning more meaningful and relevant to children's lived experiences, while also strengthening cultural identity and community engagement. In addition, outdoor learning in natural coastal environments provides rich opportunities for experiential education that enhances cognitive development, creativity, environmental awareness, and socio-emotional skills. Meanwhile, technology integration offers an important solution to overcome geographical barriers by expanding access to learning resources and improving teacher capacity, although it requires adequate infrastructure and training to be effective. The combination of these strategies—contextual learning, community involvement, nature-based education, and appropriate digital integration—creates a comprehensive approach that can reduce educational disparities and improve the quality of early childhood education in remote and coastal areas. Therefore, strengthening collaboration among educators, families, communities, and policymakers is essential to ensure sustainable and equitable educational opportunities for young children in these regions.

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