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THE IMPLEMENTATION OF BASIC MOVEMENT LEARNING MODELS IN EARLY CHILDHOOD: A SYSTEMATIC REVIEW

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ABSTRACT

Early childhood physical, cognitive, social, and emotional development all depend on fundamental movement skills. However, the use of motor learning in early childhood education frequently encounters pedagogical difficulties, such as the requirement for stimulating learning environments, different developmental stages, and short attention spans. Thus, the purpose of this systematic review was to find, assess, and compile learning models that help kids between the ages of 0 and 7 acquire basic motor abilities. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards were followed in this study's systematic review design. Keywords pertaining to basic movement abilities, motor learning, teaching methods, and early childhood education were used to gather data from the Scopus database. To guarantee the quality and accessibility of the data, the inclusion criteria were restricted to full-text, peer-reviewed articles published in English. Seven pertinent papers were included for qualitative synthesis following screening and eligibility evaluation of the 19 publications that were originally found. The results showed that the best methods for enhancing young children's motor skills were game-based learning models and methods using local knowledge. These methods supported social, cognitive, and emotional growth while also improving coordination, balance, agility, and other basic movement skills. Additionally, cultural identity and significant educational experiences were fostered by traditional games and culturally appropriate activities. Although infrastructure and teacher preparedness continue to be barriers to their implementation, technology-based interventions, especially augmented reality-assisted learning, have also shown beneficial impacts on the development of motor skills. In conclusion, the most promising pedagogical strategies for promoting basic movement skills and holistic development in early infancy are game-based and local wisdom-oriented learning models, while technology presents more chances for future advancements in motor learning.

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INTRODUCTION

Early childhood, particularly the age range from 0 to 7 years, is widely recognised as a critical phase in the formation of physical habits and neuromuscular development (Santos et al., 2021). During this period, children experience accelerated growth that is ideal for acquiring and refining fundamental movement skills (Dobell et al., 2020). These skills, which include locomotor, manipulative and stability skills, are not merely physical abilities, but key prerequisites for children to be able to participate in more complex physical activities and sports in later stages of development (Liu et al., 2025).

In the context of pre-school and early primary education, basic movement learning plays a central role that extends beyond physical fitness (Logan et al., 2015). Well-structured motor learning has been shown to correlate positively with children's cognitive development, emotional regulation and social skills (Hill et al., 2024). Physical activity provides proprioceptive and vestibular stimuli that are essential for the maturation of the central nervous system; consequently, children who are physically active tend to have better levels of concentration and academic readiness (Božani, 2024).

Despite its important role, the implementation of motor learning in early childhood is often faced with various pedagogical challenges in schools. Teachers and physical education practitioners must contend with the distinctive characteristics of young children, such as limited attention spans, the need for varied play, and differences in physical maturity (Skene et al., 2022). Rigid, conventional instructional approaches often fail to sustain children's active engagement and may even reduce their intrinsic motivation to move (Dese et al., 2025).

In response to these challenges, various innovative learning models have been developed and implemented over the past decade (Muflihah et al., 2024). A number of approaches, such as game-based learning, adaptive movement exploration and the integration of technology and visual media, are increasingly being incorporated into the early years education curriculum (Alotaibi, 2024). These models are specifically designed to create a safe, enjoyable and child-centred learning environment, so that the acquisition of motor skills occurs naturally and meaningfully (Febriani et al., 2023).

Alongside the proliferation of these learning models, the academic literature is currently filled with a wide range of empirical studies yielding highly varied findings. There are many interventions claimed to be effective, yet there is no comprehensive synthesis mapping out which pedagogical elements contribute most significantly to the success of a learning model among the 0–7-year-old population (Buckler et al., 2023). This lack of synthesis makes it difficult for educators and curriculum policymakers to select and adapt the most evidence-based learning models (Lum et al., 2022).

Consequently, this systematic literature review was conducted with the aim of identifying, evaluating and synthesising various models of basic movement learning applied to young children. It is hoped that this review will provide a comprehensive understanding of the effectiveness of these various learning models, highlight the most successful

pedagogical strategies, and offer practical recommendations for the development of physical education curricula at the early childhood education level.

METHODS

Study Design

This study identifies and synthesizes research findings on fundamental movement skills, learning model, and teaching strategy in physical education for early childhood using a qualitative approach and systematic review design. To ensure systematic, transparent, and reliable procedures in each phase of identification, screening, eligibility, and inclusion, this review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) criteria. The SCOPUS database was used as a data source because it contains credible scientific publications that have undergone a peer-review process related to the research topic. The selected articles were then analyzed using descriptive qualitative analysis to identify, compare, and summarize the main findings related to the development of physical literacy and basic motor skills in elementary school students (Arif & Ardha, 2025).

Study Procedures

On 25 May 2026, data were collected from previous research publications using the keywords "fundamental movement skills" OR "motor learning" OR "motor development" AND "learning model" OR "teaching strategy" OR "physical education intervention" AND "early childhood" OR "preschool" OR "kindergarten" OR "children 0-7". The inclusion criteria for this study were documents written in the form of articles and in English. The use of English was mandatory to prevent misunderstandings during the review process. This analysis excludes documents not written in the form of articles and in English. The selection of publications relevant to the keywords is also important to ensure that the results of the literature review are consistent with the research objectives. The screening process was conducted through the stages of identification, screening based on abstracts and titles, eligibility testing by reading the full text, and final inclusion in accordance with the PRISMA guidelines. Key findings regarding learning model and fundamental movement skills in early childhood physical education were identified through qualitative analysis of articles meeting the criteria, which were subsequently categorized by author, year, aim, method, and research findings.

RESULTS

The result of PRISMA screening process

The screening process, carried out using the PRISMA flowchart, identified 19 documents in the database based on the keywords used (Figure 1). These results were screened again to exclude articles not published in English. An eligibility assessment was then conducted to

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select the articles to be included in the literature review. The final result was 17 of the most frequently cited and relevant articles.

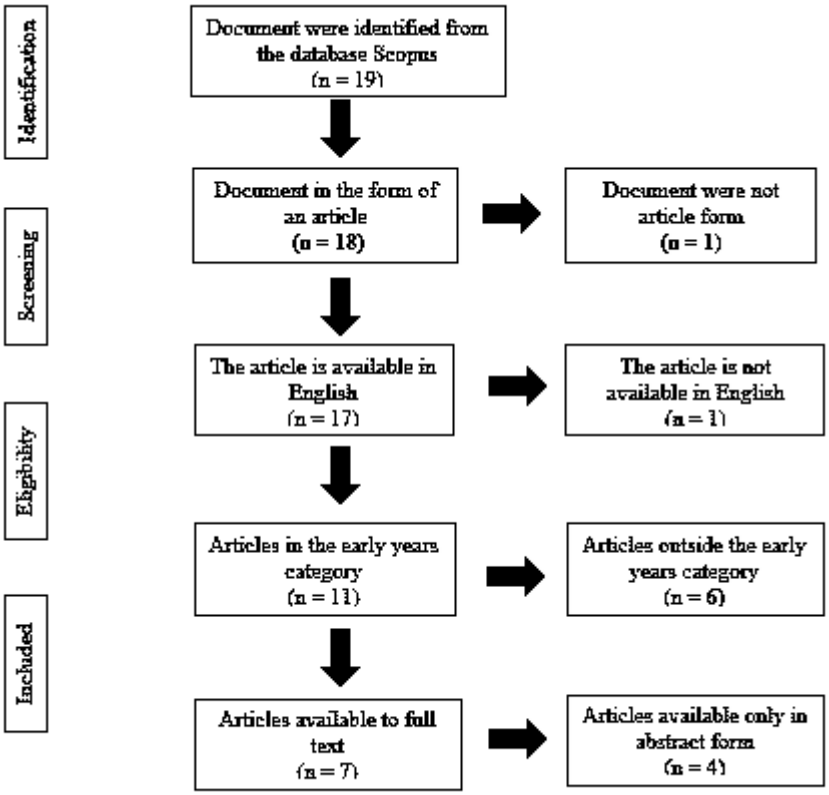

Figure 1. PRISMA flowchart of the article selection process

Literatur Review

In this section, a literature review was conducted using relevant articles with the highest number of citations (Table 1). Based on the results of the screening using pre-determined keywords, 17 articles were selected for use in this literature review. This literature review serves as a foundation for researchers to obtain findings consistent with the objectives of this study.

Tabel 1. Literatur Review

Author	Total Cited	Research Purpose	Method	Result
(Festiawan et al., 2024)	14	To describe the effectiveness *Motor Learning Model* Based on Local Wisdom (MLMBLW) in Improving Fundamental	Descriptive study	The learning model used is MMLBB (a motor learning model based on Balinese culture and local wisdom), which is effective in improving

		Skills of students in *early childhood* education programs in Buleleng Regency in Bali Provinces.		the basic motor skills of young children.
(Pradipta et al., 2023)	5	to create a model of Buyung gymnastics in gross *motor learning* in *early childhood*.	research and development (R&D)	Based on Aiken's validity, the Si Buyung exercise model for improving gross motor skills in *early childhood* has a good score, indicating that the Si Buyung exercise model can be applied in *early childhood*.
(Navarra et al., 2022)	4	to investigate whether the development of motor skills changed depending on different amounts of a physical education program (PEP) in children aged 3–5 years.	school-based randomized trial	These findings can be useful for standardizing PEPs in *preschool* settings so that they can be applied by teachers for planning effective programs for developing motor skills in *early childhood*.
(Faruk, 2025)	3	To prove that interventions of physical education by using augmented reality based mobile learning can significantly improve gross motor skills in elementary school students.	experimental	These findings may guide options for those looking for effective ways to improve gross motor skills especially for *early childhood*. The interventions of physical education by using augmented reality based mobile learning can significantly improve gross motor skills in elementary school students.
(Okilanda et al., 2025)	1	to formalize learning basic movements based on fun games to	Quasi experimental	The movement-based learning model using fun games effectively teaches

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		develop the coordination of movements in children aged 5–6 years.		movement patterns while enhancing children's coordination, motivation, responsibility, and social skills.
(Andriati et al., 2025)	0	to demonstrate that traditional play can function as an effective pedagogical model that integrates social, cognitive, and *motor learning* while preserving local cultural heritage.	Participatory Ethnographic Study	This research offers a replicable and low-cost *learning model* that bridges traditional play with contemporary educational demands.
(Sriwidaningsih & Friskawati, 2022)	0	to reveal a relevant approach to learning using motion and sound games in improving early childhood cognitive development.	Research and Development (R&D)	The learning model used is the Motion and Sound Games approach (Gesuk Model), which has been proven effective in enhancing the cognitive abilities of young children through play activities that combine physical movement with sound or music.

DISCUSSION

The Effectiveness of Game-Based Learning Models on Motor Skills

The results of the literature review indicate that the approach most effective in helping young children develop their motor skills is the play-based learning model (Bikalawan et al., 2025). As found by Okilanda et al., (2025), who used 'fun games' as the basis for developing basic movement skills, and by Andriati et al., (2025), who used conventional games as a learning medium, both studies demonstrate that play activities help to improve children's motor coordination, balance, agility and basic motor skills.

The developmental characteristics of young children, who prefer to learn through enjoyable and meaningful activities, are key to the success of play-based learning (Sari et al., 2023). Play in early childhood is not merely a source of entertainment, but also a primary means of exploring the surrounding environment, developing physical abilities, and learning new skills (Sando et al., 2023; Yee et al., 2022). When motor activities are presented in the form of play, children become more motivated to participate actively (Bikalawan et al.,

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2024), resulting in a higher frequency and quality of movement compared to traditional, instructor-led learning (Skene et al., 2022).

Repeating these motions is a crucial part of learning fundamental motor abilities (Arif et al., 2025). Children can improve their motor control patterns through disguised repetition in a play-based setting without experiencing psychological exhaustion too soon. According to Logan et al., (2015); Robinson et al., (2015), "the variety of movements in these games provides continuous proprioceptive and vestibular stimulation, which is essential for accelerating neuromuscular adaptation and enhancing the flexibility of children's movement mechanics." And motion and sound games improve early childhood cognitive development (Sriwidaningsih & Friskawati, 2022).

The Integration of Local Wisdom as an Innovation in Motor Skills Learning

Based on previous research, the utilisation of local wisdom is a promising innovation in the teaching of motor skills to young children. Research by Festiawan et al., (2024), which applied the Motor Learning Model Based Local Wisdom (MLMBLW), showed that elements of local culture can serve as a foundation for designing effective motor skills learning activities. Similarly, research by Andriati et al., (2025) indicates that traditional games can serve as a learning model that preserves local culture whilst promoting the development of motor skills.

The integration of local wisdom provides a more contextual learning experience, as the activities undertaken by children are based on the social and cultural environment with which they are already familiar (Ahdad et al., 2023). Through a naturally-oriented approach, children are able to understand the rules of the game, imitate actions, and actively engage in the learning process. Furthermore, utilising local culture as a teaching tool can help children develop a sense of ownership of their cultural heritage from an early age (Shih, 2022).

From the perspective of early childhood education, the idea that learning should focus on the child's immediate environment is also supported by strategies based on local wisdom (Ahdad et al., 2023). Learning is not merely about mastering motor skills, but also about developing learners' cultural identity, social values and character (Zheng, 2024). Consequently, models that fully adopt a modern approach without taking the local cultural context into account are considered less effective than learning models that draw on local wisdom.

The Use of Technology in Children's Motor Skills Learning

Technological advances have opened up new opportunities for the development of motor skills learning models. According to research by Faruk, (2025), pupils' gross motor skills can be significantly improved through the use of augmented reality-based mobile learning in physical education. Although this study was conducted with primary school pupils, the

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findings reveal the potential of technology as an innovative tool for the development of motor skills (Arif et al., 2024).

Thanks to augmented reality technology, kids can watch movements in real time. AR's visual elements provide essential extrinsic feedback when it comes to learning new skills. Before the action becomes routine, this input aids in the development of more accurate motor memory, helps children understand the appropriate range of motion (ROM), and corrects faulty kinematic phases (Azzahra et al., 2025). The interactive elements of this technology also help to improve pupils' concentration and engagement during the learning process (Alotaibi, 2024). Technology can offer a more engaging and varied learning experience compared to traditional approaches that rely on teacher-led presentations (Adhe et al., 2024). The interactive elements of this technology also help to improve pupils' concentration and engagement during the learning process (Alotaibi, 2024). Technology can offer a more engaging and varied learning experience compared to traditional approaches that rely on teacher-led presentations (Behnamnia et al., 2023).

However, the results of the literature review indicate that, when compared with game-based or local knowledge-based models, the use of technology in the development of motor skills in early childhood remains very limited (Adhe et al., 2024). This is likely due to a lack of resources, teachers' readiness, and the need for more intensive support when technology is applied to early childhood education.

The Impact of Motor Learning Models on Children's Holistic Development

One of the key findings of the literature review is that the benefits of motor learning models extend beyond improving motor skills to influencing other aspects of a child's development. Various studies underline that motor learning concurrently functions as a catalyst for cognitive enhancement (Sriwidaningsih & Friskawati, 2022) and the cultivation of socio-emotional qualities such as responsibility and collaboration (Okilanda et al., 2025; Andriati et al., 2025).

From a social-emotional perspective, group physical activities give children the opportunity to learn to communicate, collaborate, respect norms and regulate their emotions whilst interacting with their peers (Hill et al., 2024). Compared to individual learning, this environment fosters more ideal social development.

Limitation

There are several limitations to this review. First, the scope of relevant studies may be limited due to the use of a single database (Scopus). Second, language bias may occur because only English-language articles were included. Third, generalization of findings is limited because the number of studies included is relatively small (n = 7). Fourth, direct comparisons and meta-analyses were not possible due to the diversity of study designs and outcome measures. Finally, these results do not fully apply to other levels of education due

to the emphasis on physical education in preschools. To strengthen the evidence, future evaluations should involve more databases, broader inclusion criteria, and larger samples.

CONCLUSION

According to the findings of a comprehensive research, game-based learning models and approaches that integrate local expertise are the most effective pedagogical strategies for the development of basic motor skills in early childhood. In addition to strengthening children's motor skills through natural and enjoyable repetition, these approaches enhance children's holistic development, which encompasses the cognitive and social-emotional domains as well as the reinforcing of cultural identity. Interactive technology has enormous promise as a learning innovation in the interim, but adoption across the 0–7 age group is still hampered by infrastructure preparedness and instructor expertise. Practically speaking, it is recommended that physical education curriculum designers and teachers at the preschool through early primary school levels prioritize developing physical activities that emphasize play elements and the use of traditional games. Future research should focus on developing motor learning technology platforms that are more user-friendly and suited to young children's requirements, as well as longitudinal experimental investigations to evaluate the long-term retention of the motor skills taught.

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CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest regarding the publication of this article.

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