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The impact of movement education model intervention on basic movement skills of 4–5-year-old children

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ABSTRACT

Problem: This study was driven by the lack of diversity in physical education lessons in schools, thus limiting the optimal development of children's basic motor skills. **Purpose:** This study aims to determine the impact of implementing a movement-based learning model on improving basic motor skills in children aged 4-5 years at Al-Hidayah Kindergarten, Lambopini Village, Iwoimenda District, Kolaka Regency. **Methods:** The method used was a quasi-experimental design with a pre-test and post-test in one group, with 15 students taken from the sample. Data collection was carried out using the Basic Motor Ability Test which includes locomotor, non-locomotor, and manipulative aspects, which was carried out before and after the intervention for six sessions. **Result:** The results in this study, referring to the paired t-test analysis, showed a significant difference between the pre-test and post-test scores with an average increase of 16.4 points and a significance value of 0.000 (<0.05). The results indicate that a structured basic movement learning model based on active games and adapted to the child's developmental stage is effective in improving coordination, agility, muscle strength, and confidence in performing movements. **Conclusion**: In conclusion, basic movement learning is effective in developing basic motor skills in childhood and can be an appropriate physical education strategy for teachers in rural areas with limited resources.

Keywords: basic movement, physical literacy, movement learning model.

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Introduction

Basic motor skills are an important foundation that supports children's physical, cognitive, and social development from an early age. Often referred to as the golden age of growth and development, children are in a critical phase between the ages of 4 and 5, where appropriate stimulation through motor learning will significantly determine the quality of their future development. This period is characterized by rapid maturation of motor functions, both gross motor skills such as running, jumping, throwing, and catching, as well as fine motor skills such as drawing, coloring, and cutting simple patterns. Mastering these skills not only supports children's physical readiness for formal education but also influences their self-confidence, social skills, as well as their mental and cognitive readiness for more structured learning (Homeschooling HSPG 2024 ; Halodoc 2023) . Referring to the Standards for Child Development Achievement Levels (STPPA), basic motor skill stimulation must be implemented systematically and in a planned manner, adapting to the developmental stage and unique characteristics of each child.

However, the reality on the ground shows a gap between needs and implementation. Not all early childhood children receive adequate opportunities for optimal physical activity. In many kindergartens, especially in remote or disadvantaged areas, learning activities tend to be monotonous and do not include physical activity. The lack of variety in physical education has been shown to hinder gross motor development, which in turn affects body coordination, balance, muscle strength, and motor control. Recent

research shows that some children have difficulty maintaining simple movements, such as spinning a hula hoop for 10 seconds, indicating weak core strength and poor balance control (Aletheia Petra 2023; (JER 2024) .

This is relevant to Al Hidayah Kindergarten, located in Lambopini Village, Iwoimenda District, Kolaka Regency. Despite its strategic location on the Trans-Sulawesi Highway, the school environment still reflects the characteristics of a rural area with limited access to innovative educational resources. Initial observations indicate that physical activity in the kindergarten remains general, without the implementation of structured movement learning models or modern approaches to physical education. Limited facilities, inadequate teacher training, and minimal integration of physical activity into the curriculum can hinder the optimal development of children's motor skills. Therefore, movement education-based interventions tailored to the local context and student characteristics are needed.

Empirical evidence supports the relevance of such interventions. For example, research at Purbayan Kindergarten showed that the implementation of planned dance movement therapy significantly improved gross motor skills in 4- to 5-year-old children, with the average practice score increasing from 27.77 to 41.36 after the intervention (Triana, A., & Widyastuti 2023) . Similar results were found at Pembina Kindergarten, where a combination of movement and singing activities proved effective in improving children's flexibility, coordination, and movement accuracy (Murhum A. 2023) . Furthermore, at Permai Kindergarten in Surabaya, the implementation of movement and singing methods in accordance with STPPA consistently produced positive results in students' gross motor skills (STPPA 2014) .

Based on these findings, this study has strategic relevance. From a theoretical perspective, these findings are expected to contribute to the development of an effective and applicable physical education teaching model for children aged 4-5 years in rural areas. From a practical perspective, these findings can help teachers at Al Hidayah Kindergarten design physical education lessons that are more engaging, structured, and developmentally appropriate. Meanwhile, from a policy perspective, these findings can contribute to the implementation of the STPPA program and strengthen the physical literacy program currently promoted by the government, particularly in Southeast Sulawesi, to ensure every early childhood child has equal opportunities for optimal growth and development.

To meet this urgency, a strong theoretical foundation is needed to ensure that the interventions developed have a clear scientific basis. The conceptual framework of motor development is an important guideline in developing learning models that are appropriate to the needs of early childhood, especially in rural areas. A deep understanding of the stages of motor development, biological maturation factors, and the role of environmental stimulation allows for the development of structured, adaptive, and effective motor learning programs. Therefore, this study not only offers practical solutions for educators at Al-Hidaya Kindergarten but also aims to ensure that the intervention is aligned with proven child development theories, so that the results can contribute significantly to the development of basic motor skills while supporting children in achieving optimal physical literacy.

Child motor development theory serves as the primary conceptual framework in this study, with the starting point of view (Gallahue, DL, & Ozmun 2012) explaining that motor development occurs through systematic and interrelated stages. At the age of 4–5 years, children are in the basic motor pattern phase, a stage that requires mastery of basic motor skills that include locomotor abilities (such as running, jumping), non-locomotor (such as bending, stretching), and manipulative skills (such as throwing, catching, or kicking). This understanding is in line with maturation theory (Gesell, A., & Amatruda 2023) , which emphasizes that motor development is highly dependent on biological maturation processes but still requires directed environmental stimulation to maximize developmental potential. In accordance with this (McGraw 1991) distinguishes between reflexive and voluntary movements, and emphasizes that basic motor skills not only occur naturally but can also be taught, improved, and optimized through appropriate interventions.

In terms of learning, this study adopted the principles of motor learning theory proposed by Schmidt, R.A., & Lee (2014) , which emphasizes the importance of variation in practice to ensure that motor skills are not only mastered but also applied in different situations. This principle is supported by social cognitive learning theory (Bandura, 2020) , which explains that children learn effectively through the process of observation, imitation, and modelling, so the role of teachers as movement models and feedback providers is very important. In addition, play theory (Vygotsky, 1978) and Piaget, 2023) provide a philosophical foundation for how play is a natural way for children to learn, explore, and internalize new experiences. Through active play designed according to the child's zone of proximal development, a structured motor learning model can promote independent and collaborative learning processes.

The pedagogical approach used in this study was also inspired by the Teaching Games for Understanding (TGfU) model proposed by Bunker, D., and Thorpe (2021) . This approach encourages

children to learn motor skills through complex and contextual play, rather than through monotonous and repetitive exercises. This strategy not only increases children's intrinsic motivation but also develops their cognitive understanding of movement principles. Similarly, Gardner, H.'s Theory of Multiple Intelligences (2017) recognizes motor-kinaesthetic intelligence as a form of intelligence that can be honed in a structured manner, making movement learning an integral part of a child's overall development.

Overall, this framework aims to implement physical literacy as conceptualized by Whitehead (2024) . Physical literacy encompasses not only physical abilities but also the confidence, motivation, and understanding that enable individuals to actively engage in physical activity throughout their lives. Early learning of basic motor skills is a fundamental prerequisite for achieving this physical literacy. Lack of adequate stimulation at 4–5 years of age can result in delayed motor development later in life, as illustrated in Gallahue and Ozmun's Hourglass Model of Motor Development. Therefore, movement education-based interventions at the preschool level are not only important but also urgent given their strategic role in building the foundation of motor skills and an active lifestyle throughout life.

Method

This study used a quasi-experimental design with a pre-test and post-test with a one-group pretest-posttest design. This design was chosen because it allows researchers to measure changes in basic motor skills in the same group before and after the implementation of the Movement Education learning model. This study involved all children aged 4-5 years enrolled in Al-Hidayah Kindergarten, Lambopini Village, Iwoimenda District, Kolaka Regency, with a total of 15 participants. Given the relatively small population, this study used a total sampling method, in which all members of the population were included in the study.

Data collection was conducted through a basic motor skills test that included three main components, namely locomotor (running, jumping), non-locomotor (standing on one leg, bending), and manipulative (throwing, catching a ball). This test was administered twice, namely before the intervention (pre-test) and after the intervention (post-test). The instrument used was the Basic Motor Skills Assessment Sheet modified from the Test of Gross Motor Development-2 (TGMD-2) (Ulrich DA 2000) to adapt to the context of children aged 4–5 years in Indonesia. The validity of the instrument's content was obtained through expert evaluation by two certified physical education teachers and one certified kindergarten teacher. In addition to primary data from the test results, secondary data was also collected in the form of school records.

This research was conducted in several stages. The first stage—preparation—included coordination with schools and parents, development of an intervention plan, and instrument testing. The second stage—implementation—began with a pilot test, followed by six sessions (two weeks) of approximately 30 minutes each. Each session consisted of a series of movement lessons designed around active play. The third stage—evaluation—included final testing and data verification. Finally, the research results were analyzed and presented.

The collected data were analyzed using descriptive and inferential statistics. Descriptive statistics were used to describe the mean, standard deviation, minimum, and maximum values, while inferential analysis was used to determine the significance of differences between the initial and final trial results using a paired t-test. Normality was tested using the Shapiro-Wilk test, and homogeneity was tested using the Levene test. All analyses were performed using SPSS version 25 with a significance level of 0.05.

Results

Descriptive statistical data from 15 participants before and after being given an intervention in the form of a basic movement learning model aimed at improving motor skills. Parameters displayed include the number of samples (N), average (mean), standard deviation, maximum value, and minimum value.

Table 1. Description of motor skills: Posttest and Pretest results with learning model

	N	Mean	Standard deviation	maximum	minimum
Pre-test	15	24.20	2,704	29	20
Post test	15	40.60	2,720	45	36

Based on the research results, the average pretest score was 24.20 and the posttest score was 40.60. This represents a highly significant increase of 16.40 points, or approximately 67.8%, from the initial score. This indicates that the application of the movement learning model had a strong positive impact on improving participants' motor skills. This significant increase in average scores reflects that almost all participants experienced significant motor skill development. The standard deviation for the pretest was

2.704 and for the posttest was 2.720. The relatively similar standard deviations indicate that although the average motor skills of participants increased significantly, variation between individuals remained consistent. In other words, almost all participants showed a similar pattern of improvement, so the program was considered effective overall. The maximum score for the pretest was 29, while for the posttest it reached 45. This increase indicates that participants with the best motor skills experienced significant performance improvements, confirming that the movement learning model was able to optimize individual potential. Meanwhile, the minimum pretest score of 20 increased to 36 in the posttest. This is important because it shows that even participants with the lowest motor skills experienced significant progress. Thus, the program is inclusive and effective for participants of all ability levels. Overall, the significant average increase, accompanied by increases in minimum and maximum scores, confirms that the motor learning model significantly contributes to motor skill improvement. This suggests that this learning approach not only benefits participants with already strong skills but also significantly helps those with lower baseline abilities.

Table 2. Normality test

	class	Kolmogorov-Smirnov [and]			Shapiro-Wilk		
		Statistics	df	Signature.	Statistics	df	Signature.
Pre-Test of Motor Skills	1	.125	15	.200 *	.968	15	.834
Post Test of Motor Skills	1	.121	15	.200 *	.967	15	.816

Based on the data in the table, a normality test was conducted using the Kolmogorov-Smirnov and Shapiro-Wilk tests on the pre-test and post-test Movement skill data. The test results show that the skill data in the initial movement test is accepted. The significance of the Kolmogorov-Smirnov test is 0.200, and the Shapiro-Wilk test is 0.834. These values are far from 0.05, so it can be concluded that the pre-test data are normally distributed. Meanwhile, based on the results of the post-test movement skill test, the significance value of the Kolmogorov-Smirnov test is 0.200, and the significance value of the Shapiro-Wilk test is 0.816, which is also greater than 0.05. This indicates that the post-test data are normally distributed. Therefore, the results of both tests indicate that the skill data before and after the movement test meet the assumption of normality, so that further analysis can use parametric tests.

Based on the analysis of the results, the significance value of both normality test methods (Kolmogorov–Smirnov and Shapiro–Wilk) for all data groups exceeded the critical limit of 0.05. According to (Ghozali 2016) If the significance level is > 0.05, if the significance level is > 0.05, the data distribution can be considered normal. The consistency of the results obtained from the two methods confirms that the data distribution in this study does not deviate significantly from the normal distribution.

These results are consistent with the opinion (Razali, NM, & Wah, 2011) that the Shapiro–Wilk test is more sensitive to small sample sizes (n < 50), and if the results are consistent with the Kolmogorov–Smirnov test, then the conclusion about normality becomes more valid. Therefore, the use of parametric statistical methods in this study is considered appropriate.

Table 2. Paired sample test

Variables	mean	Standard deviation	Std. Error mean	t	Sig
Pre-Test and Post-Test	-16,400	.737	.190	-86,208	.000

Based on the Paired Sample Test table, the mean difference between the pre-test and post-test skill assessments is -16.400 seconds with a standard deviation of 0.737 and a mean standard deviation of 0.190. The 95% confidence interval for the mean difference is between -16.808 and -15.992, without crossing the zero value. The t-test value obtained is -86.208 with a degree of freedom (df) of 14 and a significance level (Sig. 2-tailed) of 0.000. Since the Sig. (0.000) value <0.05, it can be concluded that there is a statistically significant difference between the motor skill scores before and after the test.

The very large mean difference (a difference of -16.400) with a high t-value (|t| = 86.208) indicates that the changes were not due to chance, but rather a true effect of the treatment/intervention. The confidence interval, which is entirely on the negative side, confirms that post-test scores were consistently higher than pre-test scores (since the pre-test-post-test calculation yields a negative value). These results support the assumption that the teaching method or strategy used in this study was effective in improving the participants' motor skills. This is consistent with previous findings that structured interventions can provide significant improvements in children's overall motor skills (Morgan, PJ 2022 ; Rudd, J. 2019) .

After the implementation of a specially designed motor learning model (a structured program consisting of several sessions that include locomotor, non-locomotor, and manipulative exercises in the form of games), improvements in basic motor skills were observed in a group of 4-5 year old children at Al-Hidayah Kindergarten. Descriptively, the average basic motor skill scores for all subjects increased from baseline to post-intervention. It can be concluded that this increase is consistent with the trend found in many studies on the development of basic motor skills (FMS) in preschool children, namely that structured interventions tend to produce significant improvements compared to groups without intervention or control groups.

Discussion

The results of this study show a significant increase in the basic motor skills of children aged 4-5 years after the implementation of the basic movement learning model at Al-Hidayah Kindergarten. This improvement is clearly visible in the post-test results after the intervention, where most children were able to perform locomotor, non-locomotor, and manipulative movements with better coordination, accuracy, and confidence compared to the pre-test results. These findings indicate that the implementation of structured and systematic learning based on the principles of basic movement skill development can have a real positive impact. Before the intervention, most students showed limitations in the aspects of dexterity, coordination, and basic muscle strength. This is evident from field observations where some children experienced difficulty in maintaining balance, performing repetitive movements consistently, and lacked confidence in trying new movement variations. This phenomenon is consistent with the observations of kindergarten teachers who stated that children rarely get the opportunity to practice basic motor skills systematically due to limited opportunities and the teaching methods used.

The implementation of the fundamental motor learning model changes the dynamics of classroom learning. Children become more active, enthusiastic, and fully engaged during activities. Teaching strategies that combine play activities, varied motor tasks, and positive feedback have been shown to increase children's intrinsic motivation. This creates a fun learning environment, encouraging children to try new movements without fear of making mistakes. Furthermore, the principle of structured repetition used in the fundamental motor learning model also influences the development of fundamental motor skills. Through consistent and varied repetition, children not only memorize movement patterns but also internalize them until they become part of their motor skills. The use of simple tools and equipment such as small balls, mini obstacles, and jump ropes makes the learning process more engaging and challenging, while also stimulating their sensorimotor development.

The results of improving children's basic motor skills after implementing the movement learning model at Al-Hidayah Kindergarten can be understood through several theoretical perspectives and supported by international empirical evidence. First, from the perspective of basic motor development (Gallahue, DL, & Ozmun 2012) , ages 4–5 are a critical period for strengthening locomotor, manipulative, and non-locomotor stability skills. Interventions that systematically stimulate these three areas provide opportunities for children to engage in structured repetition appropriate to their developmental stage, thereby accelerating the maturation of basic motor skills. This is in line with intervention research showing that planned programs that integrate skill-specific exercises improve motor competence more effectively than random or unstructured exercises.

Second, motor learning theory (Schmidt, R.A., & Lee, 2014) emphasizes the importance of varied practice for building robust and applicable motor representations. At Al-Hidaiyah, activities include structured play that presents diverse challenges (e.g., catching from different angles, jumping varying distances), allowing children to learn to adapt their motor patterns to different contexts, a mechanism believed to enhance retention and generalization of motor skills. Recent literature supports the role of structured practice and appropriate intervention frequency in achieving robust motor representations.

Third, Bandura's Social Cognitive Theory helps explain the role of modelling and social reinforcement in interventions. Young children are highly sensitive to demonstrations by teachers and peers; observing and imitating correct movements is an important learning mechanism. In the real world, when teachers or peers demonstrate throwing or balancing techniques, children imitate and receive positive feedback, which increases motivation and repetition of movements—critical factors in motor skill acquisition. Intervention studies involving modelling and social feedback have shown better outcomes than interventions using only verbal instructions.

Fourth, Whitehead's concept of physical literacy provides long-term meaning to research findings: improving fundamental motor skills not only leads to better technical abilities but also to increased confidence, motivation, and engagement in physical activity. The Al-Hidayah Kindergarten program, which designs exercises as games, promotes both affective (enjoyment, confidence) and cognitive

(understanding of movement) development, which in turn contributes to the maintenance of active behavior. Reviews of physical literacy programs and family-centered health care interventions confirm a strong relationship between improved motor competence and increased physical activity in children.

In addition to the main theories mentioned, there are other theories that enrich the interpretation of the findings. Physical literacy is an important foundation for long-term health and well-being, encompassing the ability to move confidently, the motivation, and the understanding that supports participation in physical activity throughout life (Akbar 2024). Basic motor skills, which in this study focused on children aged 4–5 years, are a key component in developing this physical literacy. This research suggests that physical literacy can be enhanced through structured physical education, which in turn promotes the development of basic motor skills and helps identify early sporting talent. Well-designed motor education interventions at the preschool level can build a strong foundation before children enter elementary school. These findings are consistent with other research showing that physical activity-based education programs are effective in improving motor skills, while physical competence in elementary school students has been shown to increase with age and systematic training experience. Furthermore, good physical literacy also builds movement confidence, which ultimately increases children's motivation and active participation in various physical activities.

In accordance with this, a study conducted by (Haris IN 2025) This study found that physical literacy plays a crucial role in optimizing motor development in childhood. The results of the study indicate that the development of physical literacy through physical education can significantly improve gross motor skills, fine motor skills, and mastery of basic movements in children. These results provide a strong theoretical foundation for this study, which focuses on the impact of motor learning model interventions on basic motor skills in children aged 4-5 years. This article also highlights the importance of physical education as a means to guide children's development according to their age, talents, interests, and potential through interesting and meaningful physical activities. This is in line with the motor learning model applied in this study, which is expected to provide empirical evidence regarding the effectiveness of this approach in Al-Hidayah Kindergarten. A motor learning model intervention for 4-5 year old children at Al-Hidayah Kindergarten showed a significant increase in post-test scores, a phenomenon that can be explained by the fundamental motor skills (FMS) framework proposed by Cliff, DP 2023. They emphasized that the preschool period is a critical time for strengthening fundamental motor skills—locomotor, manipulative, and stability—through structured and repetitive stimulation. These results support the relevance of this intervention, as it targets the optimal period for fundamental motor development in children.

Furthermore, motor skill learning theory (Schmidt, R.A., & Lee 2014) emphasizes that varied practice and specific feedback are key to developing strong motor skills that can be applied across contexts. Interventions in this area that allow children to engage in motor activities through play with a variety of tasks naturally apply this principle, as demonstrated by children's improvements in motor coordination and accuracy in subsequent testing. Newell (2022) further offers a perspective on motor skill development as a result of the interaction between the individual, the task, and the environment. The use of modified tools (such as ball size), adapted environments (safe spaces, treadmills), and adaptive task contexts enable children to independently discover functional motor solutions—one reason why children at Al-Hidayah Kindergarten show significant progress. Bandura (2020) in his Social Cognitive Theory, emphasized that observation and imitation are highly effective learning methods for early childhood. In this intervention context, teachers and peers act as models by providing examples of appropriate movements. When children imitate these movements and receive positive feedback, their motivation and engagement in learning increase significantly. This process not only strengthens motor skill mastery but also fosters self-confidence, which is crucial for their future participation in physical activity. In accordance with this, Whitehead (2024) in his concept of physical literacy emphasizes that physical literacy encompasses physical, affective, and cognitive dimensions in an integrated manner. The development of motor skills combined with self-confidence and intrinsic motivation, implemented through a play-based approach in Al-Hidayah Kindergarten, is believed to foster a positive attitude towards long-term physical activity.

Piaget's (2023) theory of play-based learning further supports this argument. Piaget viewed play as a natural environment for children to explore and learn new experiences, including motor skills. When motor skills are developed through play, children tend to be more actively engaged and learn in a more meaningful way. Recent research also suggests that a play-based approach can stimulate high levels of intrinsic motivation while improving long-term motor skill retention. Besides that, The updated “Maturity Consideration” theory in developmental review (Rudd, J., 2019) Provides important insights into tailoring interventions to the child's physiological maturity level. Interventions tailored to the child's physical abilities and readiness have been shown to be more effective because they do not demand abilities beyond

the child's developmental limits. This approach is also applied in practice, where interventions are tailored to the developmental level of children aged 4–5 years.

Furthermore, the relationship between motor skills and cognitive function is supported by the results of a recent cognitive-motor study conducted by (Wang G et al., 2022) . This study showed that fundamental motor skills (FMS) interventions not only affect motor skills but also promote the development of executive functions, including attention and working memory. This provides strong evidence that early motor learning interventions in children are not only important for physical development but also play a strategic role in shaping children's holistic learning readiness. Comparison with previous studies supports the validity of these findings. Recent systematic reviews and meta-analyses have shown that structured interventions in school or childcare settings produce sustained improvements in FMS scores. Several field studies with 4- to 5-year-old children (e.g., structured 6- to 12-week programs or interventions that include teacher/specialist training) have found significant improvements in TGMD scores or other FMS scores, particularly when the programs are intensive and delivered by trained instructors. Results from Al-Hidayah Kindergarten are consistent with these findings: targeted, short-term interventions using direct scaffolding can produce measurable changes in fundamental motor skills.

Practically, these findings have implications for early childhood education (ECE) practices in rural areas such as Lambopini Village, Kolaka. This relatively simple and low-cost play-based intervention can be adapted by ECE teachers after brief training, with an emphasis on task modification, the use of local media, and parental involvement to ensure children's motivation is maintained at home. From a policy perspective, these findings support efforts to strengthen physical literacy in ECE programs and the need for capacity-building programs for ECE teachers in remote areas. International evidence suggests that programs that build teacher capacity or involve physical education specialists often have greater impact, making investment in hands-on learning an effective strategy.

CONCLUSION

The results of the study showed that the implementation of a structured, systematic, and fun play-based movement education model was proven to significantly improve the basic motor skills of children aged 4-5 years at Al-Hidayah Kindergarten. This improvement includes locomotor, non-locomotor, and manipulative areas, which are characterized by better motor coordination, increased accuracy, and higher confidence in performing various movements. The success of this intervention is due to the principles of directed repetition, task variation, modification of tools and the environment, the use of experiences modelled by teachers and peers, and the provision of consistent positive feedback. In addition to affecting physical aspects, this intervention also contributes to the development of children's psychosocial aspects, including cooperation, intrinsic motivation, and the ability to actively participate in physical activities. These results confirm that structured movement learning at an early age plays a strategic role in developing the foundations of physical literacy, learning readiness, and active participation of children in physical activities at subsequent levels of education.

The results of this study indicate that the Fundamental Movement Learning Model has a significant positive impact on the development of fundamental motor skills in children aged 4 to 5 years. However, this study still has limitations in terms of sample size and research design, so the results cannot be broadly generalized. Therefore, further efforts are needed through pedagogical practice and further research to strengthen the findings and expand the application of this model in various early childhood education contexts. In the context of learning practices, early childhood educators are advised to integrate play-based movement activities into the daily curriculum, considering the principle of guided repetition, providing varied tasks, and modifying educational media to suit children's abilities. For policymakers, it is important to design programs to improve the competence of early childhood educators, especially in areas with limited resources, so that teachers can design and implement effective movement education by utilizing local resources. From a research perspective, future studies are expected to use more rigorous designs, such as control groups, larger samples, and follow-up measurements to understand the long-term impact of this intervention. Research can also be directed to studying the optimal variation in the frequency, duration, and type of activities for motor skill development, as well as the importance of these activities for children's cognitive, social, and emotional development. Furthermore, active parental involvement in the movement learning process is crucial. This involvement not only supports the development of children's basic motor skills but also creates a more conducive learning environment, enabling holistic and sustainable child development.

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