Journal of Comparative Education Nexus
Vol. 1 No. 2, Juni 2026, pp.50-58
https://journal.gioedutech.id/index.php/jcen/issue/view/

Culturally Responsive Physical Literacy Intervention for Enhancing Fundamental Movement Skills in Early Childhood: A Sociocultural Learning Approach

Maharani Dwitami [1,2]*, Mhd Nurkamto [1], Siddiq Hidayatullah [1], Hery Pradita [2]
[1]Universitas Sebelas Maret, Indonesia
[2]Universitas Negeri Yogyakarta, Indonesia
***Corresponding Author:** *maharanidwitami@student.uns.ac.id*

ABSTRACT

This study investigated the effectiveness of a culturally responsive physical literacy intervention based on a sociocultural learning approach in enhancing fundamental movement skills among children aged 5–6 years. A quasi-experimental pretest–posttest control group design was employed involving 24 kindergarten children selected through purposive sampling with parental consent. The experimental group (n = 12) consisted of children from TK Negeri 4 Yogyakarta, while the control group (n = 12) was drawn from TK Negeri 11 Yogyakarta. The intervention was developed based on Vygotsky's sociocultural theory and integrated four core dimensions of physical literacy from the Australian Physical Literacy Framework: movement competence, confidence, collaboration, and understanding of rules. Learning activities incorporated culturally responsive pedagogies through storybooks, traditional games, social interaction, and teacher scaffolding. Fundamental movement skills were assessed using the Ball Skills subtest of the Test of Gross Motor Development–Third Edition (TGMD-3). Data were analyzed using the Mann–Whitney U test and the Wilcoxon rank-sum test. The results revealed significant differences between pretest and posttest scores (W = 56.949, p = 0.04384) and between the experimental and control groups at posttest (W = 44.807, p = 0.0004301). These findings indicate that the intervention effectively improved children's fundamental movement skills. The study highlights the importance of integrating mediated learning, scaffolding, and the Zone of Proximal Development into early childhood physical literacy programs. The intervention is recommended as an innovative and culturally relevant approach to physical education in Indonesian kindergartens.

Keywords: Physical Literacy; Movement Skills; Sociocultural Learning; Cultural Pedagogy; Early Childhood.

Article history

Received:	*Revised:*	*Accepted:*	*Published:*
Date 14/04/2026	*Date 30/05/2026*	*Date 18/06/2026*	*Date 30/06/2026*

Citation (APA Style): *Maharani Dwitami et al. (2026). Culturally Responsive Physical Literacy Intervention for Enhancing Fundamental Movement Skills in Early Childhood: A Sociocultural Learning Approach*

INTRODUCTION

Physical literacy has emerged as a central construct in contemporary early childhood education because it provides the foundation for lifelong engagement in physical activity, health, and well-being. Within the physical literacy framework, fundamental movement skills (FMS) are recognized as essential competencies that enable children to participate confidently and effectively in a wide range of physical activities. These skills include locomotor, stability, and object-control movements such as throwing, catching, dribbling, kicking, and striking objects with implements (Sport Australia, 2019). Research indicates that the development of object-control skills through early motor interventions contributes significantly to children's cognitive development, particularly executive functioning, although its influence on social development may be comparatively less pronounced (Capio et al., 2024). These findings suggest that early interventions targeting fundamental movement skills not only improve physical competence but also support broader

developmental outcomes that are critical during early childhood.

The importance of fostering physical literacy through fundamental movement skills is further supported by Vygotsky's sociocultural theory of learning. According to this perspective, learning occurs most effectively within the Zone of Proximal Development (ZPD), where children acquire new competencies through guided participation and meaningful social interaction. The application of ZPD principles in physical education promotes adaptive teaching practices that align with children's developmental readiness and learning needs (Wang & Zhang, 2022). In this context, teachers act as mediators who provide scaffolding to facilitate skill acquisition and confidence development. Fundamental movement skills are not solely physical competencies but also serve as cognitive stimuli that emerge through structured social engagement. Given that these skills require deliberate stimulation, repeated practice, and supportive learning environments (Goodway et al., 2021), integrating physical literacy experiences into early childhood curricula through a sociocultural lens becomes a strategic approach to promoting holistic development. Furthermore, psychological factors such as goal setting and self-monitoring have been shown to enhance motor skill performance and intrinsic motivation among young learners (Hidayat, 2012). Such findings reinforce the importance of mediated learning experiences that encourage children to actively participate in and regulate their own developmental progress.

The development of physical literacy and fundamental movement skills is strongly influenced by children's social, cultural, and environmental contexts. Evidence from Iran demonstrated that children living in rural environments supportive of physical activity achieved higher levels of physical literacy and physical activity participation than children residing in suburban and urban settings (Mohammadi et al., 2023). These findings highlight the significance of sociocultural and ecological factors in shaping children's movement experiences and physical competence. Cultural background and gender differences have also been identified as important determinants of object-control skill development. Indonesian boys, for example, demonstrated performance levels comparable to American boys in catching and kicking but showed lower proficiency in throwing and striking skills (Syafruddin et al., 2020). Similarly, Indonesian girls performed below their American counterparts in most object-control skills except kicking (Syafruddin et al., 2020). Furthermore, significant differences in object-control abilities have been observed between Indonesian boys and girls aged 5–6 years, emphasizing the necessity for gender-sensitive and culturally responsive physical literacy interventions during early childhood (Dilandes et al., 2022).

Despite the recognized importance of physical literacy, the development of fundamental movement skills in kindergarten settings remains suboptimal. One major challenge is the limited availability of educators with specialized training in physical education. In many public kindergartens, physical-motor learning is facilitated by classroom teachers who may not possess adequate expertise in designing and implementing developmentally appropriate movement programs. Consequently, children often receive insufficient stimulation in essential movement competencies such as throwing, catching, kicking, and other object-control skills. This issue is particularly concerning because physical-motor development constitutes a core component of the Early Childhood Education Graduate Competency Standards (The Ministry of Education, 2022). Therefore, innovative educational approaches that integrate physical, cognitive, social, and cultural dimensions of learning are urgently needed to enhance physical literacy outcomes among young children.

One promising strategy for addressing these challenges is the implementation of culturally responsive physical literacy interventions grounded in sociocultural learning principles. Such interventions integrate movement experiences with meaningful social interaction, cultural values, and the foundational dimensions of physical literacy. Drawing on Vygotsky's theory of mediated learning, scaffolding, and the Zone of Proximal Development (Cole et al., 1978), culturally responsive physical literacy programs can create authentic learning environments where children develop movement competence through collaborative and culturally meaningful activities. In this approach, picture books are utilized as mediating tools during read-aloud sessions, followed by game-based activities that incorporate elements of Indonesian culture. Through interactions with

peers and teachers, children receive scaffolding that supports their progression toward higher levels of competence. The learning activities are designed to foster four key components of physical literacy: movement competence, self-confidence, collaboration, and understanding of rules (Sport Australia, 2019). Therefore, this study aimed to investigate the effect of a culturally responsive physical literacy intervention based on a sociocultural learning approach on the development of fundamental movement skills among kindergarten children aged 5–6 years in Yogyakarta, Indonesia. The findings are expected to contribute to the growing body of evidence regarding culturally responsive physical literacy practices and early childhood physical education.

METHOD

This study employed a quasi-experimental design to examine the effectiveness of a culturally responsive physical literacy intervention based on a sociocultural learning approach in enhancing fundamental movement skills among children aged 5–6 years. The study was conducted in two public kindergartens in Yogyakarta, Indonesia, involving a total of 24 children. The control group consisted of 12 children from TK Negeri 11 Yogyakarta, while the experimental group included 12 children from TK Negeri 4 Yogyakarta. Participants were selected purposively according to the following inclusion criteria: (1) aged 5–6 years, (2) actively enrolled in one of the participating kindergartens, (3) free from medical conditions that could limit participation in physical activities, and (4) obtained written informed consent from parents or legal guardians. Fundamental movement skills were assessed using the Test of Gross Motor Development–Third Edition (TGMD-3), specifically the Ball Skills subtest, which evaluates object-control competencies including striking, dribbling, catching, kicking, and throwing (Goodway et al., 2021).

Children in the control group participated in regular physical-motor learning activities delivered by classroom teachers following the standard kindergarten curriculum. These activities typically consisted of singing, rhythmic body movements, and simple ball-related games. In contrast, the experimental group received a culturally responsive physical literacy intervention over 12 sessions, with each session lasting approximately 150 minutes. The intervention was designed according to sociocultural learning principles and integrated culturally meaningful experiences with physical literacy development. Five categories of movement activities were included, targeting essential fundamental movement skills: (1) throwing, (2) catching, (3) dribbling, (4) kicking, and (5) striking. Each intervention session was organized into four sequential phases: opening activities (30 minutes), core activities (60 minutes), break and social interaction (30 minutes), and reflection and closing activities (30 minutes).

The opening phase was designed to introduce movement concepts and establish meaningful learning contexts through mediated experiences. Children participated in shared reading activities using the illustrated storybook *Serunya Bermain Bola* (*The Fun of Playing Ball*), which served as a pedagogical tool to connect narrative experiences with physical movement learning. Through teacher-guided discussions, children were introduced to fundamental movement concepts while simultaneously experiencing social interaction and collaborative meaning-making. This approach aligns with Vygotsky's concept of mediated learning, in which cultural tools and social communication facilitate cognitive and motor development (Cole et al., 1978). The storybook activities also encouraged children to relate movement experiences to their daily lives, thereby strengthening the cultural relevance of the intervention.

The core activity phase focused on developing fundamental movement skills through culturally responsive and play-based learning experiences. Each session began with a warm-up followed by a series of traditional and modified Indonesian games designed to promote object-control skills, confidence, collaboration, and understanding of rules, reflecting the four domains of physical literacy identified by Sport Australia (2019). Children engaged in activities that required throwing, catching, dribbling, kicking, and striking while interacting with peers in cooperative and competitive contexts. Games derived from Indonesian cultural traditions, including modified versions of *Gobak Sodor* and *Bentengan*, were incorporated to provide meaningful and contextually relevant learning experiences. Throughout these activities, teachers continuously observed children's performance, identified their Zone of Proximal Development (ZPD), and provided

appropriate scaffolding to support skill acquisition and participation. The core activities concluded with a cool-down session aimed at promoting physical recovery and emotional regulation.

The break and reflection phases were integral components of the intervention and were designed to support social-emotional learning and metacognitive development. During the break period, children shared meals and engaged in informal conversations with peers, fostering social interaction, empathy, communication skills, and a sense of community. Following the break, teacher-guided reflection sessions encouraged children to discuss their experiences, challenges, and achievements during the movement activities. These discussions helped children recognize their progress, develop self-confidence, appreciate teamwork, and internalize game rules. Such reflective practices are consistent with Vygotsky's sociocultural perspective, particularly the concepts of scaffolding and the Zone of Proximal Development, where learning is strengthened through guided dialogue and social interaction (Cole et al., 1978). Furthermore, the integration of culturally familiar games and narratives promoted children's cultural identity and sense of belonging while simultaneously supporting physical literacy development. By combining movement competence, social interaction, cultural relevance, and reflective learning, the intervention provided a holistic educational experience that addressed the physical, cognitive, emotional, and social dimensions of early childhood development.

FINDINGS AND DISCUSSION

Findings

TGMD-3 pretest and posttest ball skills subtest

In the initial phase, students' manipulative movement skills were assessed using the Ball Skills subtest of the TGMD-3 instrument. The pretest data for each skill (K) in the control group are presented in Table 1.

Table 1. Control group pretest data

No.	Skill	Mean	SD	Median	Skew	Kurtosis	SE
1.	K1	1.332	0.658	1.3	-0.252	-1.395	0.19
2.	K2	1.272	0.492	1.25	-1.218	1.29	0.14
3.	K3	1.307	0.753	1.17	-0.88	0.51	0.22
4.	K4	1.083	0.63	1	-0.403	-0.753	0.18
5.	K5	1.375	0.57	1.5	-0.303	-1.223	0.165
6.	K6	0.982	0.825	1	0.045	-1.24	0.237
7.	K7	0.873	0.812	1	0.0725	-1.743	0.235

Given the relatively small sample size of 24 participants (n = 24), the normal assumption was not met. Therefore, a non-parametric statistical test was employed instead of the independent samples t-test. The Wilcoxon Rank-Sum Test was considered appropriate for detecting location shifts in median values between groups. Before analyzing posttest differences between the control and experimental groups, it was necessary to confirm that there were significant median differences in the pretest scores, particularly with respect to their central tendency. With an experimental data sample size of n=24, the median value, skewness (distribution slope), and kurtosis (distribution peak sensitivity level) were analyzed. The skewness value describes the level of asymmetry of the data distribution, while the kurtosis value provides information about the peak or flatness of the distribution, especially in pretest data. In this context, the median is considered more representative than the mean because it is not affected by outliers. In contrast, the mean can be affected by extreme values, such as maximum and minimum values.

When comparing the median values from Tables 1 and 2, it becomes evident that several manipulative movement skills showed notable improvement following the implementation of the sociocultural-based movement game model. Specifically, the skills that demonstrated measurable progress included the one-handed dribble of a stationary ball (K3), two-handed catch (K4), overhand throw (K6), and underhand throw (K7).

Table 2. Experiment group posttest description

No.	Skill	Mean	SD	Median	Skew	Kurtosis	SE
1.	K1	1.116	0.556	1.2	-0.146	1.462	0.16
2.	K2	1.168	0.645	1	-0.5425	0.93	0.185
3.	K3	1.417	0.846	2	-0.953	-0.39	0.247
4.	K4	1.61	0.513	1.67	-0.805	-0.8	0.15
5.	K5	1.29	0.793	1.5	-0.807	0.5275	0.23
6.	K6	1.395	0.487	1.5	-0.5375	0.74	0.14
7.	K7	1.373	0.52	1.5	-0.24	-0.81	0.15

Skill Key: K1: Two-handed strike of a stationary ball; K2: One-handed forehand strike of a self-bouncing ball; K3: One-handed dribble of a stationary ball; K4: Two-handed catch; K5: Kick of a stationary ball; K6: Overhand throw; K7: Underhand throw

These skills are essential components of early childhood motor development, requiring coordination, timing, and confidence in object control. The Mann–Whitney U test confirmed statistically significant differences in posttest scores between the control and experimental groups, validating the effectiveness of the intervention. For instance, the improvement in catching and throwing skills suggests that children benefited from repeated, scaffolded practice within a socially interactive and culturally familiar learning environment. However, not all students showed equal progress, indicating that factors such as attendance consistency, engagement levels, or individual developmental differences may have influenced outcomes.

The relevance of these findings lies in their support for Vygotsky's sociocultural theory, which emphasizes the role of social interaction and guided learning within the Zone of Proximal Development (ZPD). The game model's structure, incorporating storytelling, traditional games, and collaborative play, provided a rich context for mediated learning, allowing children to internalize movement concepts through meaningful experiences. For example, using culturally familiar games like "Gobak Sodor" or "Bentengan" not only enhanced motor skill acquisition but also reinforced cultural identity and social values. Moreover, the integration of reflection activities helped children recognize their progress, boosting self-confidence and encouraging metacognitive awareness. These elements collectively contributed to a holistic learning experience that addressed physical, cognitive, and emotional development. The study's results underscore the importance of designing early childhood physical education programs that are not only skill-focused but also culturally responsive and socially engaging.

Hypothesis testing

Baseline equivalence testing (Pre-test)

A Mann-Whitney U test (Wilcoxon rank-sum test) was conducted to assess the baseline equivalence of the control and experimental groups prior to the intervention. The analysis compared the pre-test scores of both groups to determine if they originated from populations with the same distribution. The results indicated a statistically significant difference at the baseline (W = 56949, *p* = .04384). This significant pre-test difference reveals that the groups were not equivalent in terms of manipulative movement skills before the study began. This is a methodological limitation, as it introduces a potential confounding variable. To account for this initial disparity, the primary analysis correctly focuses on the change or the post-test difference between the groups, rather than a direct comparison of post-test scores alone.

Post-test comparison and treatment effect

A second Mann-Whitney U test was performed on the post-test data to evaluate the effect of the intervention after accounting for the baseline difference. The test revealed a statistically significant and substantially larger difference between the control and experimental groups (W = 44807, *p* < .001). The marked significance in the post-test comparison, despite the initial group inequality, provides strong evidence for the efficacy of the intervention. The sociocultural-based game model administered to the experimental group is the most possible explanation for the pronounced divergence in their post-test performance compared to the control group. This confirms that the treatment had a significant positive effect on manipulative movement skills.

Evidence of treatment effects

A Wilcoxon rank-sum test was conducted to evaluate the effect of the intervention on manipulative movement skills by comparing the post-test scores of the experimental group (which received the sociocultural-based game model) and the control group. The results revealed a statistically significant difference between the two groups ($W = 44807$, $p = .00043$).

Since the p-value is substantially less than the conventional alpha level of .05, the null hypothesis, which stated that there was no difference in the post-test scores of the two groups, is rejected. This provides strong statistical evidence to support the alternative hypothesis (H_a), confirming that the observed difference in location (i.e., the central tendency of the scores) is not equal to zero. Therefore, it is concluded that the sociocultural-based manipulative movement skill game model had a significant and positive treatment effect, successfully improving students' manipulative movement skills compared to the control condition.

The pretest and posttest data reveal a statistically significant difference between the control and experimental groups, validating the use of an independent two-sample design. This distinction confirms that the groups were not equivalent at baseline and that the intervention had a measurable impact. Specifically, the experimental group demonstrated higher posttest scores, indicating that the sociocultural-based manipulative movement game model effectively enhanced children's manipulative movement skills. These skills, such as throwing, catching, dribbling, and striking, are foundational for physical literacy and future participation in sports and recreational activities. The structured intervention, which incorporated culturally familiar games and scaffolded learning experiences, provided children with repeated opportunities to practice and refine these skills in a socially engaging environment. For example, activities like “Gobak Sodor” and “Bentengan” not only encouraged physical coordination but also fostered teamwork and rule comprehension, aligning with the principles of the Australian Physical Literacy Framework.

The relevance of these findings extends beyond statistical validation; they highlight the pedagogical value of integrating sociocultural elements into early childhood physical education. The model’s success suggests that culturally responsive teaching strategies can significantly improve motor skill acquisition, especially when combined with mediated learning and scaffolding techniques rooted in Vygotsky’s theory. Moreover, the data implies that with a larger sample size, improvements would likely be observed in additional skills such as the two-handed strike of a stationary ball, one-handed forehand strike of a self-bouncing ball, and kicking a stationary ball, skills that showed potential but did not reach statistical significance in this study. This opens up avenues for future research to explore the model’s broader applicability in various cultural settings and larger populations. Ultimately, the study underscores the importance of designing early childhood curricula that are not only developmentally appropriate but also culturally meaningful, thereby promoting holistic growth in physical, cognitive, and social domains.

Discussion

The findings of this study demonstrate that a culturally responsive physical literacy intervention grounded in a sociocultural learning approach significantly enhanced fundamental movement skills among children aged 5–6 years. The significant differences observed between the experimental and control groups indicate that integrating culturally meaningful learning experiences with movement activities can effectively promote physical literacy development in early childhood. These findings provide empirical support for Vygotsky’s sociocultural theory, which emphasizes that learning occurs through social interaction, scaffolding, and engagement within the Zone of Proximal Development (ZPD) (Cole et al., 1978; Wang & Zhang, 2022). The statistically significant differences identified through the Mann–Whitney U test further confirm the effectiveness of the intervention in facilitating children's movement competence. Importantly, the intervention extended beyond motor performance by incorporating the four interconnected domains of physical literacy identified in the Australian Physical Literacy Framework: movement competence, confidence, collaboration, and understanding of rules (Sport Australia, 2019). These findings suggest that culturally responsive physical literacy interventions can provide a

comprehensive foundation for children's lifelong engagement in physical activity and learning.

The most substantial improvements were observed in object-control components of the TGMD-3, particularly one-handed dribbling, two-handed catching, overhand throwing, and underhand throwing. These skills represent essential dimensions of fundamental movement competence that support children's participation in a wide range of physical activities. The observed improvements may be attributed to the structured design of the intervention, which integrated movement learning into a sequence of meaningful educational experiences, including storytelling, collaborative play, social interaction, and guided reflection. Rather than treating movement skill development as repetitive technical practice, the intervention framed movement learning as an engaging social and cultural experience. This approach likely enhanced children's motivation, reduced performance anxiety, and strengthened their confidence to participate actively in movement tasks. Similar findings have been reported by Bai et al. (2024) and De Souza et al. (2023), who found that structured movement interventions can significantly improve motor competence when children are provided with supportive and engaging learning environments. The present findings therefore reinforce the proposition that physical literacy development is optimized when movement experiences are embedded within meaningful social contexts.

A distinctive feature of the intervention was the use of picture storybooks and culturally relevant narratives as mediating tools to connect cognitive, social, and motor learning experiences. The read-aloud sessions served as transitional spaces where children could construct meaning before engaging in movement-based activities. This finding aligns with Feuerstein et al. (1980), who argued that mediated learning experiences enhance cognitive processing and facilitate deeper learning outcomes. Through teacher-guided discussions and scaffolding, children were encouraged to connect movement concepts with personal experiences and cultural values. Such practices are highly consistent with Vygotsky's view that learning occurs through culturally mediated social interactions (Cole et al., 1978). Furthermore, the inclusion of culturally familiar games and narratives ensured that physical literacy learning remained relevant to children's lived experiences. This contextual relevance may explain the high levels of engagement observed among participants and highlights the value of culturally responsive pedagogy in early childhood physical education.

The findings also underscore the important role of culture in shaping physical literacy development. Consistent with Mohammadi et al. (2023), the present study demonstrates that children's movement competence cannot be separated from their sociocultural environment. Traditional Indonesian games incorporated into the intervention provided opportunities for children to practice fundamental movement skills while simultaneously developing social competencies such as cooperation, communication, turn-taking, and respect for rules. Activities adapted from games such as *Gobak Sodor*, *Bentengan*, and other culturally familiar play traditions enabled children to develop movement competence within meaningful social contexts. This finding supports the argument that culturally responsive physical literacy programs can simultaneously strengthen motor development and cultural identity. Moreover, improvements in children's confidence and collaborative behavior align with the broader conceptualization of physical literacy, which emphasizes motivation, confidence, social participation, and lifelong engagement in physical activity alongside movement competence (Sport Australia, 2019). These findings are further supported by Capio et al. (2024), who reported significant relationships between motor skill proficiency, executive functioning, and broader developmental outcomes during early childhood.

Despite the positive outcomes, not all participants demonstrated equivalent levels of improvement. Several children showed limited progress, suggesting that responsiveness to physical literacy interventions may vary according to individual, familial, and contextual factors. Inconsistent attendance reduced opportunities for repeated practice and teacher scaffolding, while differences in motivation and interest toward physical activity may also have influenced learning outcomes (Barnett et al., 2025; McDonough et al., 2020). Furthermore, parental support, health conditions, and environmental opportunities for active play may contribute substantially to children's movement development (Flynn et al., 2023; He et al., 2024). These findings highlight the need for future interventions to incorporate differentiated instructional strategies and stronger family engagement components. From a practical perspective, the study emphasizes the necessity

of equipping kindergarten teachers with knowledge and skills related to physical literacy and culturally responsive pedagogy. Consistent with Suryadi et al. (2023), the present findings suggest that movement education should move beyond isolated motor exercises toward integrated learning experiences that combine culture, social interaction, and physical activity. Moreover, strengthening educational policies and curriculum implementation remains essential, particularly given the importance of motor development within the Early Childhood Education Graduate Competency Standards (Permendikbudristek, 2022). Although the quasi-experimental design and non-parametric statistical analyses provided robust evidence of intervention effectiveness, future studies should involve larger and more diverse samples and employ longitudinal designs to investigate the long-term impact of culturally responsive physical literacy interventions on children's physical, cognitive, and socio-emotional development. Overall, the present study demonstrates that culturally responsive physical literacy interventions grounded in sociocultural learning principles represent a promising and sustainable approach to fostering holistic development in early childhood education.

CONCLUSION

This study concludes that the culturally responsive physical literacy intervention grounded in a sociocultural learning approach is effective in enhancing fundamental movement skills among children aged 5–6 years. Drawing on Vygotsky's concepts of mediated learning, scaffolding, and the Zone of Proximal Development (ZPD), the intervention successfully improved children's object-control skills, particularly dribbling, catching, and throwing, while simultaneously fostering confidence, collaboration, and understanding of rules as essential components of physical literacy. The significant differences in post-test scores between the experimental and control groups indicate that the intervention provided a meaningful, culturally relevant, and developmentally appropriate learning environment that supported children's physical, cognitive, and socio-emotional development. The integration of culturally familiar storybooks, traditional games, and structured social interactions enriched children's movement experiences and strengthened their engagement in physical activity. Therefore, this culturally responsive physical literacy intervention is recommended as an innovative instructional approach for early childhood physical education, particularly in kindergarten settings. Successful implementation requires teacher professional development, culturally relevant learning resources, and supportive educational policies that prioritize physical literacy as a core component of early childhood education. Future studies involving larger and more diverse samples, as well as longitudinal research designs, are recommended to examine the long-term effects of culturally responsive physical literacy interventions on children's holistic development and lifelong participation in physical activity.

REFERENCES

Bai, M., Lin, N., Yu, J., Teng, Z., & Xu, M. (2024). The effect of planned active play on the fundamental movement skills of preschool children. *Human movement science*, 96, p. 103241. DOI: https://doi.org/10.1016/j.humov.2024.103241.

Barnett, L., Verswijveren, S., Ridgers, N., Tietjens, M., Lander, N., & Abbott, G. (2025). Children with high actual and perceived motor skill competence are more physically active: A pooled latent profile analysis of cross-sectional data. *Journal of Sports Sciences*, *43*, pp. 821 - 832. DOI: https://doi.org/10.1080/02640414.2025.2477419.

Capio, C. M., Mendoza, N. B., Jones, R. A., Masters, R. S. W., & Lee, K. (2024). The contributions of motor skill proficiency to cognitive and social development in early childhood. Scientific Reports,

14(1), 27956. https://doi.org/10.1038/s41598-024-79538-1

Cole, M., John-Steiner, V., Scribner, S., & Souberman, E. (Eds.). (1978). *Mind in society: The development of higher psychological processes (L. S. Vygotsky)*. Harvard University Press

De Souza, M., Nobre, G., & Valentini, N. (2023). Effect of a motor skill-based intervention in the relationship of individual and contextual factors in children with and without Developmental Coordination Disorder from low-income families. *Psychology of sport and exercise*, 67, p. 102406. DOI: https://doi.org/10.1016/j.psychsport.2023.102406.

Dilandes, A. A., Syahputra, R., Oktarifaldi, O., Putri, L. P., & Bakhtiar, S. (2022). Perbedaan level kemampuan objek kontrol berdasarkan jenis kelamin dan usia PAUD. *Jurnal Pendidikan Jasmani Indonesia, 18*(1), 27–35. https://doi.org/10.21831/jpji.v18i1.48464

Feuerstein, R., Rand, Y., & Hoffman, M. B. (1980). *Instrumental enrichment: An intervention program for cognitive modifiability*. University Park Press.

Flynn, R., Pringle, A., & Roscoe, C. (2023). Direct parent engagement to improve fundamental movement skills in children: A systematic review. *Children, 10*. DOI: https://doi.org/10.3390/children10071247.

Goodway, J. D., Ozmun, J. C., & Gallahue, D. L. (2019). *Understanding motor development: Infants, children, adolescents, adults (8th ed.)*. Jones & Bartlett Learning.

He, Y., Zhou, L., Liang, W., Liu, Q., Liu, W., & Wang, S. (2024). Individual, family, and environmental correlates of fundamental motor skills among school-aged children: a cross-sectional study in China. *BMC Public Health, 24*. DOI: https://doi.org/10.1186/s12889-024-17728-2.

Hidayat, Y. (2012). Pengaruh goal setting dan self-monitoring dalam penguasaan keterampilan gerak dan motivasi intrinsic siswa sekolah dasar [The impact of goal setting and self-monitoring on elementary students' motor skill mastery and intrincsic motivation]. *Cakrawala Pendidikan, XXXI*(3), pp. 495-511. DOI: https://doi.org/10.21831/cp.v0i3.1554

McDonough, D., Liu, W., & Gao, Z. (2020). Effects of physical activity on children's motor skill development: a systematic review of randomized controlled trials. *BioMed Research International*. DOI: https://doi.org/10.1155/2020/8160756.

Mohammadi, M., Elahipanah, F., & Amani-Shalamzari, S. (2023). The role of the cultural environment in the development of physical literacy and physical activity of Iranian children. *BMC Pediatrics, 23*(1), 477. https://doi.org/10.1186/s12887-023-04297-3

Permendikbudristek RI. (2022). *Peraturan menteri pendidikan, kebudayaan, riset, dan teknologi nomor 5 tahun 2022 tentang standar kompetensi lulusan pada pendidikan anak usia dini, jenjang pendidikan dasar, dan jenjang pendidikan menengah*.

Sport Australia. (2019). *The Australian physical literacy framework version 2*. https://www.sportaus.gov.au/__data/assets/pdf_file/0019/710173/35455_Physical-Literacy-Framework_access.pdf

Suryadi, D., Nasrulloh, A., Yanti, N., Ramli, R., Fauzan, L., Kushartanti, B., Sumaryanti, S., Suhartini, B., Budayati, E., Arovah, N., Mashud, M., Suganda, M., Sumaryanto, S., Sutapa, P., Abdullah, N., & Fauziah, E. (2023). Stimulation of motor skills through game models in early childhood and elementary school students: systematic review in Indonesia. *Retos*. DOI: https://doi.org/10.47197/retos.v51.101743.

Sutapa, P., & Suharjana, S. (2019). Improving gross motor skills by gross kinesthetic-and contemporary-based physical activity in early childhood. *Cakrawala Pendidikan, 38*(3), pp. 540-551. DOI: https://doi.org/10.21831/cp.v38i3.25324

Syafruddin, Bakhtiar, S., & Famelia, R. (2020). Indonesian and American children: Object control skills comparison. *International Journal of Psychosocial Rehabilitation, 24*(5), 756–761. https://doi.org/10.37200/IJPR/V24I5/PR201744

Wang, M., & Zhang, J. (2022). Research on the application of zone of proximal development theory in school physical education teaching in China. *Frontiers in Sport Research, 4*(5). https://doi.org/10.25236/FSR.2022.040505