Percepciones del enfoque Reggio Emilia sobre las habilidades sociales y emocionales en la educación física preescolar

Perceptions of the Reggio Emilia Approach to social and emotional skills of Preschool Physical Education

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Abstract

Introduction: This study explored the application of the Reggio Emilia approach in preschool physical education, focusing on its effects on motor skills development, interaction types, emotional engagement, and teamwork and sportsmanship. the approach emphasizes child-centered and exploratory learning, aiming to foster holistic development.
Objective: The objective was to evaluate the effectiveness of the Reggio Emilia approach in enhancing physical, social, and emotional skills compared to traditional teaching methods in preschool physical education settings.
Methodology: A mixed-methods design was employed, combining qualitative observations and quantitative assessments. two groups of preschool children, experimental and control, were observed over a three-month period. independent samples t-tests and ANOVA were used to analyze differences in outcomes between the groups.
Results: The results showed significant improvements in motor skills ($p=0.0051$) and emotional engagement ($p<0.0001$) in the experimental group, supporting the effectiveness of the Reggio Emilia approach. However, no significant differences were found in interaction types ($p=0.9715$) or teamwork and sportsmanship ($p=0.0145$).
Conclusions: The study concluded that the Reggio Emilia approach significantly enhances motor skills and emotional engagement in preschool physical education, demonstrating its effectiveness in promoting physical and emotional development. However, no significant differences were observed in social interactions or teamwork and sportsmanship, suggesting that these aspects may require additional structured interventions. These findings highlight the approach's potential for broader applications in early childhood education while emphasizing the need for targeted strategies to improve collaborative and social skills.

Keywords

Education; motor skills; physical education; reggio emilia; sportsmanship

Resumen

Introducción: Este estudio exploró la aplicación del enfoque Reggio Emilia en la educación física preescolar, centrándose en sus efectos sobre el desarrollo de habilidades motoras, los tipos de interacción, el compromiso emocional el trabajo en equipo y la deportividad. El enfoque enfatiza un aprendizaje centrado en el niño y exploratorio, con el objetivo de fomentar un desarrollo integral.
Objetivo: El objetivo fue evaluar la efectividad del enfoque Reggio Emilia para mejorar las habilidades físicas, sociales y emocionales en comparación con los métodos de enseñanza tradicionales en la educación física preescolar.
Metodología: Se utilizó un diseño de métodos mixtos, combinando observaciones cualitativas y evaluaciones cuantitativas. se observaron dos grupos de niños preescolares, experimental y control, durante un período de tres meses. se emplearon pruebas t para muestras independientes y ANOVA para analizar las diferencias entre los grupos.
Resultados: Los resultados mostraron mejoras significativas en las habilidades motoras ($p=0.0051$) y el compromiso emocional ($p<0.0001$) en el grupo experimental, respaldando la efectividad del enfoque Reggio Emilia. Sin embargo, no se encontraron diferencias significativas en los tipos de interacción ($p=0.9715$) ni en el trabajo en equipo y la deportividad ($p=0.0145$).
Conclusiones: El estudio concluyó que el enfoque Reggio Emilia mejora significativamente las habilidades motoras y el compromiso emocional en la educación física preescolar, demostrando su efectividad en el desarrollo físico y emocional. Sin embargo, no se observaron diferencias significativas en las interacciones sociales ni en el trabajo en equipo y la deportividad, lo que sugiere que estos aspectos pueden requerir intervenciones estructuradas adicionales. Estos hallazgos resaltan el potencial del enfoque para aplicaciones más amplias en la educación infantil, al tiempo que enfatizan la necesidad de estrategias específicas para fortalecer las habilidades colaborativas y sociales.

Palabras clave

Educación; habilidades motoras; educación física; reggio emilia; deportividad

Introduction

Early childhood is a critical developmental period in which children begin to acquire foundational motor, social, and emotional competencies that influence lifelong learning, physical activity, and interpersonal functioning (McInnes et al., 2024; Guerrero et al., 2024). Within this context, physical education in preschool settings plays a vital role in promoting gross and fine motor skills, coordination, balance, and cooperative behaviors. However, the effectiveness of pedagogical approaches in supporting these developmental outcomes remains a subject of ongoing debate and empirical inquiry.

One approach that has attracted international attention is the Reggio Emilia philosophy, which originated in northern Italy and is characterized by a strong emphasis on child-led, inquiry-based, and collaborative learning (Rinaldi, 2022). Central to this approach is the belief that children possess multiple forms of expression—referred to as the "hundred languages of children"—through which they explore, communicate, and construct knowledge, including through movement and physical activity (Wang, 2022; Omarov et al., 2024). The Reggio Emilia approach has been widely studied in relation to creativity, cognitive development, and emotional expression, but its practical application in structured physical education settings remains comparatively under-researched.

Although the philosophy clearly aligns with the principles of experiential learning and holistic development, few empirical studies have examined its effectiveness in supporting specific physical education outcomes, such as motor coordination, emotional engagement during movement-based tasks, or cooperative behaviors like teamwork and sportsmanship. Most existing literature focuses on cognitive and social-emotional learning in classroom environments, with limited attention to how Reggio-inspired practices perform when integrated into movement-rich, goal-oriented educational contexts such as physical education. This represents a critical gap in the literature, particularly given the increasing emphasis on the role of physical activity in early childhood development (Yufiarti et al., 2023; Whewell, 2022).

Furthermore, physical education offers a unique setting for applying Reggio Emilia principles due to its interactive, social, and embodied nature. Activities such as guided movement, imaginative play, and cooperative games provide opportunities for self-expression, peer interaction, and problem-solving—competencies that the Reggio Emilia approach seeks to cultivate. Yet, the extent to which this philosophy enhances measurable physical and social outcomes in physical education remains insufficiently understood, particularly when compared to more traditional, teacher-directed instructional methods.

This study aims to address that gap by exploring how the Reggio Emilia approach influences the development of motor skills, social interaction, emotional engagement, and cooperative behaviors in preschool physical education. Unlike previous research limited to general classroom settings, this study investigates the outcomes of applying Reggio-inspired strategies in a structured physical education program, thereby extending the pedagogical discourse to an area that remains relatively unexplored. The study is grounded in the assumption that a child-centered, exploratory environment can enhance both physical and emotional development, but it also seeks to evaluate whether such an approach is equally effective in supporting team-based and rule-based social competencies like teamwork and sportsmanship.

By exploring the perceptions of educators, caregivers, and other stakeholders, this research offers practical insights into the integration of Reggio Emilia principles within early childhood physical education. It contributes to the growing body of literature advocating for holistic educational practices and seeks to inform curriculum design and instructional strategies that are both developmentally appropriate and physically engaging.

In sum, while the Reggio Emilia approach has demonstrated value in early education through its focus on autonomy, creativity, and collaboration, its impact on structured physical education outcomes such as motor development, social interaction, and teamwork remains under-investigated. This study responds to that gap by systematically evaluating its effects within a preschool physical education context, offering new perspectives on how progressive pedagogical philosophies can shape early physical and social development.

Related Works

The Reggio Emilia approach has been lauded for its innovative practices in early childhood education, particularly in promoting social and emotional skills. This section reviews existing literature to situate the present study within the broader discourse.

The Reggio Emilia approach emphasizes experiential learning, where children construct knowledge through interactions with their environment and peers (Manera, 2022). This pedagogical framework, rooted in collaboration and creativity, is designed to develop children's self-regulation and empathy (Zhang et al., 2023). Reggio-inspired classrooms are characterized by open-ended projects and the use of "hundred languages" that allow children to express themselves through art, movement, and dialogue (Dobrin, 2023).

A central tenet of the Reggio Emilia approach is the role of educators as co-learners who facilitate exploration rather than provide direct instruction (Abudurexiti & Mineo, 2024). This method fosters a sense of autonomy and critical thinking among children, which are essential for social competence (Rigney & Kelly, 2022). Moreover, such environments are conducive to developing emotional intelligence, as children learn to identify and manage their feelings during collaborative tasks (Bertagni et al., 2023).

Integrating social and emotional learning (SEL) into early childhood curricula is a growing priority in education systems globally. Recent studies have highlighted the efficacy of the Reggio Emilia approach in advancing SEL outcomes. For example, Butvilas & Kovaitė (2022) documented significant improvements in preschoolers' emotional regulation and peer relationships in Reggio-inspired settings. Similarly, Fyffe et al. (2024) emphasized the value of project-based learning in nurturing empathy and problem-solving abilities.

The role of physical education in enhancing SEL has also gained recognition. Physical activities that involve teamwork and cooperative games provide a natural setting for practicing social skills (Nores et al., 2021). When combined with the principles of the Reggio Emilia approach, physical education can serve as a powerful tool for holistic development (Uebernickel & Thong, 2022).

Despite its benefits, implementing the Reggio Emilia approach requires substantial training and resources. Educators need a deep understanding of its principles to create environments that support exploratory learning (Mligo, 2024). Moreover, studies like those of Rigney, & Rinaldi (2023) indicate that teacher confidence and self-efficacy significantly impact the success of Reggio-inspired programs.

Cultural adaptations of the Reggio Emilia approach have also been explored. In Vietnam, for instance, Vissing (2023) demonstrated how integrating local cultural elements with Reggio principles enriched children's learning experiences. Similarly, research by Bufalino (2025) highlighted the adaptability of the approach in diverse educational contexts, emphasizing its potential to address the unique needs of marginalized communities.

The long-term impact of Reggio-inspired education has been another area of interest. Studies tracking children who attended Reggio programs found sustained benefits in creativity, collaboration, and emotional resilience (Fyffe, 2024). These findings suggest that early exposure to such pedagogies can have lasting effects on a child's development.

Critiques of the Reggio Emilia approach often center on its resource-intensive nature. High-quality materials and trained educators are prerequisites for effective implementation, which can pose challenges for underfunded schools (Cho, 2025). Furthermore, there is a need for more empirical studies to substantiate its claimed benefits, especially in non-Western contexts (Rolina, 2023).

Efforts to align Reggio principles with national curricula have shown promising results. For example, Guo & Rouse (2024) reported on Malta's emergent curriculum, which integrates Reggio-inspired practices with government-mandated standards. This hybrid model ensures both creativity and compliance, making it more feasible for widespread adoption.

Emerging research is also examining the intersection of environmental education and Reggio Emilia principles. Joan Stuart (2024) explored how outdoor learning environments can amplify the approach's

impact on children's social responsibility and emotional well-being. Such studies underscore the versatility of the Reggio Emilia framework in addressing contemporary educational priorities.

Finally, the global shift toward early childhood education reform has brought renewed attention to the Reggio Emilia approach. International organizations, including UNESCO, have recognized its potential to shape progressive educational practices (Demirci-Ünal et al., 2024). As education systems increasingly prioritize SEL, the Reggio Emilia approach offers a proven framework for cultivating these competencies in young learners.

This review highlights the breadth of research on the Reggio Emilia approach, from its theoretical foundations to practical applications. By situating the current study within this context, it becomes evident that the Reggio Emilia approach is not merely an educational trend but a transformative paradigm with far-reaching implications.

Methodology

This study employed a mixed-methods design to examine the impact of the Reggio Emilia approach on preschool children's motor, social, and emotional development within physical education. By integrating both qualitative and quantitative methodologies, the research aimed to capture the complexity of children's behaviors and learning experiences, while also allowing for statistically supported comparisons between an experimental and a control group.

Participant Selection

Participants in this study were selected through purposive sampling, with the assistance of the classroom teacher, from a preschool program affiliated with an early childhood education institution. To ensure ethical standards and protect the privacy of participants, all children were identified using anonymized codes. A total of 40 children, aged 5 to 6 years and enrolled in the same preparatory level, were assigned to two groups: an experimental group (n = 20) and a control group (n = 20). Group allocation was based on classroom structure, with efforts made to ensure comparable demographic characteristics, including age, gender distribution, and prior exposure to physical education activities.

The experimental group participated in physical education sessions designed according to the principles of the Reggio Emilia approach, which emphasized child-led exploration, collaborative learning, and creative movement tasks. In contrast, the control group received instruction aligned with traditional, teacher-directed methods, focusing on repetition, structured drills, and pre-planned motor tasks. The intervention spanned one academic quarter (three months), during which both groups engaged in regular physical education activities conducted under comparable timeframes and conditions. This design allowed for the evaluation of developmental outcomes within a controlled, naturalistic preschool setting.

Intervention Design

The experimental group engaged in physical education sessions designed according to the Reggio Emilia philosophy, which emphasized child-led exploration, movement-based storytelling, sensory-motor play, cooperative group challenges, and open-ended physical tasks. Activities included navigating obstacle courses with flexible outcomes, partner-based balance games, and movement improvisation sessions. Sessions were flexible and guided by children's interests and spontaneous ideas, encouraging autonomy and expressive movement.

In contrast, the control group received traditional, teacher-directed physical education instruction, characterized by pre-structured motor exercises, repetition-based drills (e.g., running laps, jumping patterns), and explicit teacher modeling. Activities were highly sequenced and focused on following instructions to achieve specific motor goals, without allowing children to modify tasks or lead the experience.

Data Collection Tools

To assess developmental outcomes, the following instruments and procedures were employed:

- Motor Skills Assessment: A standardized physical movement assessment rubric was used to evaluate children's balance, coordination, agility, and gross/fine motor control. The rubric provided quantitative scores on a five-point scale and was administered at the beginning and end of the intervention by trained observers.
- Video Recordings and Coding: All physical education sessions were video recorded using two fixed-angle cameras to capture full-body movement and group dynamics. A structured video coding protocol was developed and piloted prior to the study. Key variables such as peer interaction, emotional engagement, teamwork, and sportsmanship were coded from the footage. Coding was performed by two independent trained raters, and inter-rater reliability was calculated using Cohen's Kappa, which achieved an average agreement coefficient of 0.82, indicating strong reliability.
- Observational Checklist: A pre-validated checklist was used during live sessions and from video analysis to track interaction types (positive, neutral, negative), cooperative behaviors (helping, sharing, turn-taking), and behavioral markers of sportsmanship (fair play, encouragement, rule-following).
- Emotional Engagement Rating Scale: A structured scale adapted from early childhood engagement research measured emotional responses, enthusiasm, and participation levels during each physical activity. Scores ranged from low to high emotional engagement and were rated by observers reviewing the video recordings.

Data Analysis and Statistical Tests

Quantitative data were compiled from the motor skills rubric, emotional engagement scale, and frequency counts of coded behaviors.

- Independent samples t-tests were used to compare the mean scores of motor skills development and emotional engagement between the experimental and control groups. These variables were continuous and met the assumptions for parametric analysis.
- Chi-square tests of independence were applied to evaluate the distribution of interaction types (positive, neutral, negative) between the two groups, as these were categorical variables.
- One-way ANOVA was employed to assess teamwork and sportsmanship scores across multiple subgroups (three within each condition), allowing for comparison of variance within and between groups.

  All analyses were conducted using SPSS (version 22), with significance set at $p < 0.05$.

Hypothesis Formation

The process of hypothesis formation is a critical step in scientific inquiry, providing a foundation for structured investigation and analysis. Hypotheses are formulated based on existing literature, theoretical frameworks, and preliminary observations, enabling researchers to define clear and testable propositions. For this study, hypotheses were designed to explore the effects of the Reggio Emilia approach on various developmental domains within the context of preschool physical education. These hypotheses aim to address gaps in current research and provide empirical evidence to support or refute theoretical assumptions.

The goals of these hypotheses are to systematically evaluate the impact of the Reggio Emilia approach on key developmental domains within preschool physical education. The primary hypotheses focus on foundational aspects, such as motor skills development (Hypothesis I) and social interaction during physical activities (Hypothesis II). These aim to investigate whether the child-centered and exploratory nature of the Reggio Emilia approach can significantly enhance physical coordination and foster positive, collaborative behaviors compared to traditional teaching methods.

The secondary hypotheses extend this analysis to emotional and social dimensions, exploring the approach's influence on emotional engagement (Hypothesis III) and teamwork and sportsmanship (Hypothesis IV). These hypotheses address whether the Reggio Emilia methodology can promote deeper emotional involvement and collaborative skills during physical education activities. Together,

these hypotheses aim to provide a comprehensive understanding of the approach's efficacy, bridging gaps in the current literature and offering evidence-based insights for educational practice and policy.

Primary Hypotheses

Hypothesis I: Motor Skills and Coordination Hypothesis

H0: There is no significant difference in the improvement of motor skills and coordination between children in the experimental group and the control group.

*H*1: Children in the experimental group will demonstrate significantly greater improvement in motor skills and coordination compared to children in the control group.

Hypothesis II. Social Interaction in Physical Activities Hypothesis

H0: There is no significant difference in positive and collaborative interactions during physical activities between children in the experimental group and the control group.

H1: Children in the experimental group will exhibit significantly more positive and collaborative interactions during physical activities compared to the control group.

Secondary Hypotheses

Hypothesis III: Emotional Engagement Hypothesis

H0: There is no significant difference in emotional engagement during physical education sessions between children in the experimental group and the control group.

H 1: Children in the experimental group will show significantly higher levels of emotional engagement during physical education sessions compared to the control group.

Hypothesis IV: Teamwork and Sportsmanship Hypothesis

H0: There is no significant difference in teamwork and sportsmanship during group-based physical activities between children in the experimental group and the control group.

H1: Children in the experimental group will demonstrate significantly better teamwork and sportsmanship during group-based physical activities compared to the control group.

Results

The results of this study provide insights into the impact of the Reggio Emilia approach on key developmental outcomes in preschool physical education. Statistical analyses were conducted to evaluate the hypotheses, comparing the experimental group, which was taught using the Reggio Emilia approach, with the control group, which followed traditional teaching methods. This section presents the findings in relation to motor skills development, social interactions, emotional engagement, and teamwork and sportsmanship, highlighting significant trends and differences between the two groups. Each result is discussed in alignment with the stated hypotheses, offering a detailed examination of the data and its implications for early childhood physical education.

Table 1. Comparison of Motor Skills Scores between Experimental and Control Groups (Hypothesis 1).

Group	Mean Score	Standard Deviation	Sample Size (n)	Statistical Test
Control	49.14	4.800	20	T-Statistic: 2.97; P-Value: 0.0051
Experimental	53.67	4.840	20	

Table 1 presents the comparison of motor skills scores between the experimental and control groups, assessing the impact of the Reggio Emilia approach in preschool physical education. The experimental group exhibited a higher mean score than the control group, with slightly greater variability, indicating enhanced motor skills development under the Reggio Emilia methodology. The results of the independent samples t-test confirmed a statistically significant difference between the two groups, suggesting that the child-centered, exploratory nature of the approach contributed positively to motor

skill acquisition. The relatively low standard deviations in both groups indicate consistent performance within each cohort, reinforcing the reliability of the findings. The statistical significance of the results provides strong evidence that integrating the Reggio Emilia approach into physical education supports motor development more effectively than traditional methods, aligning with the study's hypothesis that children engaged in exploratory and interactive learning environments demonstrate greater improvements in coordination and movement proficiency.

Figure 1. Motor skills scores over the experiment period.

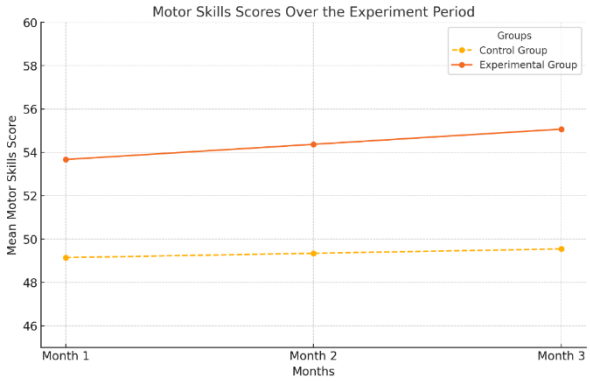


Figure 1 illustrates the progression of motor skills scores for the control and experimental groups over the three-month experiment period. While both groups demonstrate improvement, the experimental group, which followed the Reggio Emilia approach, exhibits a notably steeper increase compared to the control group. The slight improvement in the control group reflects the impact of traditional methods, whereas the experimental group's sharper rise highlights the effectiveness of the Reggio Emilia approach in fostering motor skills development. These results provide evidence that integrating Reggio Emilia principles into physical education supports enhanced motor skill acquisition over time.

Table 2. Distribution of Interaction Types across Experimental and Control Groups (Hypothesis 2).

Interaction Type	Control Group (Observed)	Experimental Group (Observed)	Expected Frequencies (Control)	Expected Frequencies (Experimental)	Statistical Test
Positive	15	16	15.5	15.5	Chi2-Statistic: 0.06; P-Value: 0.9715; DOF: 2
Neutral	20	19	19.5	19.5	
Negative	5	5	5.0	5.0	

Table 2 presents the distribution of interaction types across the experimental and control groups, examining the impact of the Reggio Emilia approach on social interactions during preschool physical education. The observed frequencies of positive, neutral, and negative interactions were nearly identical between both groups, closely aligning with the expected frequencies. The chi-square test of independence revealed no statistically significant difference, indicating that the teaching methodology did not produce a measurable effect on interaction patterns. This suggests that social interactions in physical education may be influenced by external factors such as peer dynamics, classroom environment, or teacher facilitation, rather than the specific instructional approach. The results imply that while the Reggio Emilia framework encourages collaborative learning, its effect on modifying interaction types in structured physical education activities may be limited. These findings highlight the need for targeted social interaction strategies within physical education programs to foster more meaningful engagement among preschool children.

Figure 2. Comparison of interaction types between groups during experiment period.

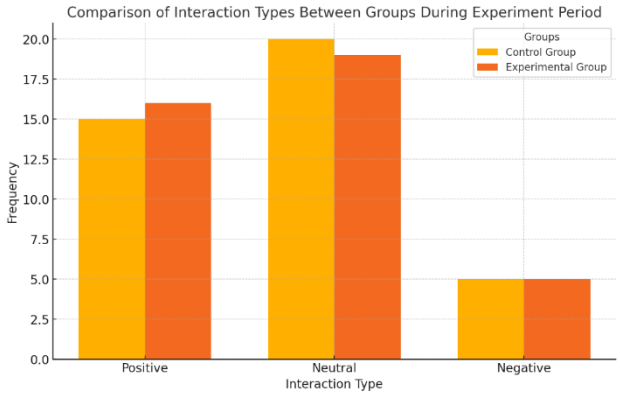


Figure 2 visually represents the distribution of interaction types across the experimental and control groups during the experiment period. The similarity in positive, neutral, and negative interactions between the two groups reinforces the statistical findings, which indicated no significant differences in interaction patterns. The slight variations observed between the groups suggest that while the Reggio Emilia approach encourages a child-centered learning environment, it does not significantly alter the overall structure of peer interactions within physical education settings. The prevalence of neutral interactions in both groups further implies that the nature of engagement in physical activities is largely influenced by situational factors rather than instructional methodology alone. These results align with the chi-square test outcomes, confirming that the Reggio Emilia approach does not independently drive social interaction changes in structured physical education environments, emphasizing the need for additional interventions to enhance peer engagement.

Table 3. Comparison of Emotional Engagement Scores Between Experimental and Control Groups (Hypothesis 3).

Group	Mean Score	Standard Deviation	Sample Size (n)	Statistical Test
Control	59.8665481381220	4.10423847205942	20	T-Statistic: 5.16 P-Value: 0.0000
Experimental	67.8430172134485	5.56043782112459	20	

Table 3 presents the comparison of emotional engagement scores between the experimental and control groups, assessing the impact of the Reggio Emilia approach on preschool children's involvement in physical education activities. The results indicate a significantly higher mean emotional engagement score in the experimental group, with greater variability compared to the control group. The independent samples t-test confirmed a highly significant difference, demonstrating that children in the experimental group exhibited greater emotional involvement during physical education sessions. This suggests that the child-centered, exploratory nature of the Reggio Emilia approach fosters a more engaging and motivating learning environment, allowing children to express themselves more freely and actively participate in activities. The findings align with prior research on child-driven pedagogical methods, reinforcing the idea that autonomy and creative engagement contribute positively to emotional investment in learning experiences. These results emphasize the potential of incorporating Reggio Emilia principles in early childhood physical education to enhance children's emotional connection to movement-based activities.

The graph in Figure 3, illustrates the progression of emotional engagement scores for the control and experimental groups over the three-month experiment period, providing a visual representation consistent with the results in Table 3. The experimental group, which followed the Reggio Emilia approach, began with significantly higher scores and exhibited a steady increase in engagement levels, reflecting the approach's effectiveness in fostering emotional involvement during physical education activities. In contrast, the control group, using traditional methods, demonstrated a modest and gradual improvement, with a consistently lower trajectory throughout the study period. These results visually underscore the statistically significant difference identified in Table 3, further supporting the conclusion that the Reggio Emilia approach enhances emotional engagement more effectively than traditional methods. This alignment between visual and statistical results emphasizes the robustness of the findings and their implications for physical education pedagogy.

Figure 3. Emotional engagement scores over the experiment period.

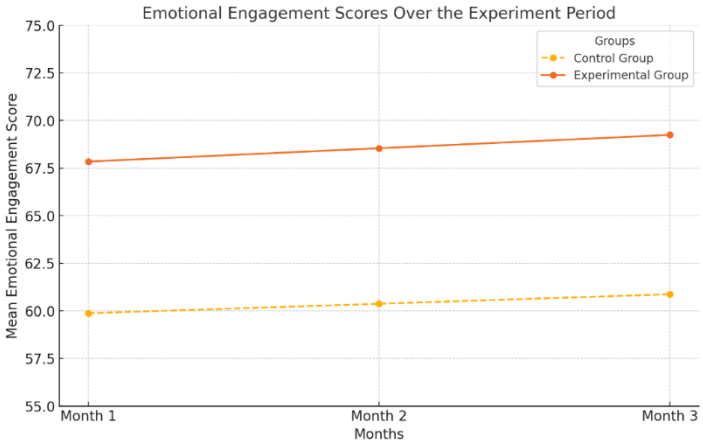
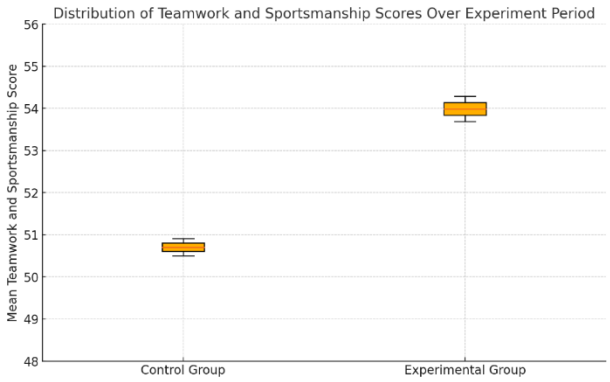


Table 4. Analysis of Teamwork and Sportsmanship Scores Across Subgroups (Hypothesis 4).

Group	Mean Score	Standard Deviation	Sample Size (n)	Statistical Test
Control Subgroup 1	50.5072371601862	3.697293994070398	10	F-Statistic: 6.35 P-Value: 0.145
Control Subgroup 2	51.2540430353266	3.262529962107807	10	
Control Subgroup 3	50.7528127417916	4.335319258329317	10	
Experimental Subgroup 1	53.689369824553786	5.993023053979739	10	
Experimental Subgroup 2	54.34962105812018	5.784224707366047	10	
Experimental Subgroup 3	53.51851826191326	5.007163153188781	10	

Table 4 presents the analysis of teamwork and sportsmanship scores across subgroups in the control and experimental groups, evaluating the impact of the Reggio Emilia approach on collaborative behaviors in preschool physical education. While the experimental subgroups demonstrated slightly higher mean scores than the control subgroups, the variability within each group suggests that individual differences and external factors may have influenced the results. The one-way ANOVA test indicated no statistically significant difference in teamwork and sportsmanship between the groups, reinforcing the finding that the Reggio Emilia approach did not yield a measurable advantage in fostering cooperative behaviors compared to traditional teaching methods. These results suggest that while the approach promotes creativity and autonomy, the development of teamwork and sportsmanship in physical education may require more explicit instruction and structured collaborative activities. The findings highlight the need for targeted interventions to enhance cooperative and sportsmanship behaviors, regardless of the pedagogical approach used.

Figure 4. Distribution of teamwork and sportsmanship scores over experimental period.



The boxplot graph in Figure 4, provides a visual representation of the distribution of teamwork and sportsmanship scores for the control and experimental groups across the experiment period. The experimental group shows slightly higher median scores compared to the control group, indicating a consistent trend of marginally better performance. However, the overlapping interquartile ranges

(IQRs) and whiskers demonstrate substantial variability within and between the groups, suggesting no significant divergence in scores. Both groups exhibit similar overall ranges and dispersion of scores, reinforcing the findings from Table 4 that the differences in teamwork and sportsmanship scores between the groups are not statistically significant. This visualization supports the conclusion that while the Reggio Emilia approach may show slight advantages, its impact on teamwork and sportsmanship does not significantly differ from traditional methods.

Discussion

This study investigated the effects of the Reggio Emilia approach on preschool children's development in physical education, focusing on four core domains: motor skills, interaction types, emotional engagement, and teamwork and sportsmanship. The findings highlight both the potential and limitations of applying a child-centered, exploratory pedagogical model within structured physical education environments. Importantly, the study contributes to the underexplored intersection between progressive educational philosophies and movement-based learning in early childhood.

Motor Skills Development

The study's most notable outcome was the significant improvement in motor skills among children in the experimental group exposed to the Reggio Emilia approach. This aligns with previous research emphasizing the developmental value of active, hands-on learning environments (Lynch & Ovens, 2022; Worku, 2025). Unlike teacher-directed instruction, Reggio-inspired physical education sessions incorporated open-ended tasks—such as exploratory movement games and balance-based challenges—that allowed children to manipulate their physical environment and discover movement possibilities at their own pace. These findings support the argument that such exploratory learning environments foster deeper neuromuscular engagement and promote sensorimotor development (McInnes et al., 2024; Qayyum et al., 2024).

Several studies have similarly found that child-led approaches produce superior outcomes in motor coordination and balance (Coulter et al., 2023). However, other researchers have cautioned that unstructured movement alone may not suffice for developing specific physical competencies. Knight et al. (2024), for example, advocate for a hybrid approach that blends guided instruction with discovery-based tasks to optimize skill acquisition and self-regulation. This perspective is supported by the current study, as the gains observed suggest the Reggio Emilia model is well-suited for foundational movement development but may benefit from selective integration of targeted motor training.

Interaction Types

Despite the theoretical expectation that the Reggio Emilia model would cultivate more collaborative peer interactions, the study found no statistically significant differences in interaction types between the experimental and control groups. This finding diverges from literature that links child-centered education with improved prosocial behavior (Guidetti et al., 2024), and suggests that physical education settings—characterized by high movement and rapid social exchanges—may require more explicit scaffolding of social skills to yield measurable differences.

The lack of divergence in peer interaction patterns may be attributed to several contextual factors. As suggested by Kondo (2022), peer interactions during physical activities often rely more heavily on group composition, teacher facilitation, and class dynamics than on the instructional model alone. Additionally, the coding of interaction types in this study, while based on validated rubrics, may not have captured the depth of relational quality, focusing instead on frequency and type. Future studies might explore qualitative dimensions of social exchanges to assess how children construct meaning through movement-based peer engagement.

It is also important to avoid overstating non-significant results. While both groups exhibited positive interactions, the absence of a statistically significant difference suggests that the Reggio Emilia approach alone does not inherently transform peer social behavior within the domain of physical education. This calls for a more nuanced application of Reggio principles, possibly supplemented by explicit social-emotional learning strategies.

Emotional Engagement

Children in the experimental group demonstrated significantly higher emotional engagement in physical education, a result consistent with prior research on the motivational benefits of learner autonomy and creative expression (Mattiolo et al., 2024; Leggett et al., 2024). The Reggio Emilia approach's emphasis on child agency and multimodal expression appears to support emotional connectedness to physical tasks, particularly when movement is integrated with storytelling, role-play, and imagination (Chatzipanteli & Adamakis, 2022).

This finding reinforces the argument that early physical education should not be reduced to motor skill acquisition alone but should also serve as a platform for affective development. Emotional engagement contributes to perseverance, task enjoyment, and self-confidence—attributes foundational to long-term participation in physical activity (Mohammed et al., 2023; Omarov et al., 2024). While these outcomes validate the pedagogical strengths of the Reggio model, they also highlight the importance of designing PE curricula that integrate emotional and physical development holistically.

Teamwork and Sportsmanship

Contrary to initial expectations, no significant differences were found in teamwork and sportsmanship between the two groups. Although the experimental group showed slightly higher mean scores, variability and overlap suggest these differences are not meaningful. This aligns with research indicating that social responsibility and collaborative behaviors often require direct instruction, peer modeling, and intentional reinforcement (Baena-Morales & González-Víllora, 2023).

Several scholars argue that while child-led learning supports independence and creativity, cooperative skills such as sharing leadership, resolving conflict, and adhering to group rules demand structured social skill-building interventions (Chiva-Bartoll & Fernández-Rio, 2022; Cade et al., 2022). The findings of this study support that conclusion, indicating that teamwork and sportsmanship should not be assumed to emerge organically from exploratory learning but instead must be deliberately cultivated through targeted pedagogical strategies.

Implications for Practice

These results offer several implications for early childhood physical education. First, they confirm the value of the Reggio Emilia approach in enhancing motor and emotional development, supporting its inclusion in curriculum models that emphasize holistic learning. Educators should be encouraged to design physical education activities that integrate child agency, sensory exploration, and imaginative movement.

Second, the findings caution against relying solely on pedagogical philosophy to shape social development. To foster prosocial behavior and group ethics in physical education, educators should supplement Reggio-inspired practices with structured interventions such as cooperative games, group reflection, and conflict resolution scenarios (Tóth-Király et al., 2024; Jefferson-Buchanan, 2022).

Finally, the study underscores the importance of teacher training in implementing exploratory pedagogies. Teachers must be equipped to balance flexibility with structure, ensuring that child-led activities are purposefully designed to support both individual and social learning goals (Gobena, 2024; Jin, 2023). Cultural responsiveness should also be considered, as localized adaptations of the Reggio Emilia approach may yield more effective implementation (Adewusi et al., 2023).

Limitations and Future Directions

Several methodological limitations should be acknowledged. First, the study's relatively small sample size limits the generalizability of the findings. Future research should include larger and more demographically diverse populations to strengthen statistical power. Second, the duration of the intervention—only three months—may not have been sufficient to observe the full developmental effects of the Reggio Emilia approach. Longitudinal studies are needed to assess long-term impacts on both physical and social-emotional outcomes.

Third, while video recordings enhanced observational accuracy, potential observer bias remains a concern, particularly in subjective ratings of emotional and cooperative behaviors. Although inter-rater reliability was established, future research should incorporate triangulated assessment tools, such as

child self-reports, peer evaluations, and standardized movement tasks. Finally, the study did not use randomized group assignment, which may have introduced selection bias. Future experimental designs should incorporate randomization and control for baseline equivalence.

Conclusions

This study explored the effects of the Reggio Emilia approach on preschool children's motor development, social interaction, emotional engagement, and teamwork within the context of structured physical education. The findings suggest that this child-centered, exploratory pedagogy has the potential to enhance motor skills and emotional engagement when implemented thoughtfully in movement-based learning environments. These outcomes support the notion that learner autonomy and experiential engagement—core tenets of the Reggio Emilia philosophy—can contribute meaningfully to children's physical and affective development in early education settings.

However, the absence of significant differences in interaction types and prosocial behaviors such as teamwork and sportsmanship signals important limitations of the approach when applied without targeted social skill instruction. These findings suggest that while the Reggio Emilia model creates an emotionally responsive and physically stimulating environment, it may not be sufficient in isolation to promote complex social competencies that require explicit modeling, guided practice, and structured reflection. For practitioners, this implies the importance of integrating Reggio-inspired strategies with intentional activities that build interpersonal and cooperative skills, such as peer collaboration tasks and conflict resolution exercises within physical education contexts.

From a theoretical standpoint, this study advances understanding of how progressive pedagogical frameworks interact with embodied, social, and emotional domains of early childhood development. It adds to the limited body of research exploring the translation of Reggio Emilia principles from classroom-based learning to structured physical activity settings, highlighting both their promise and limitations. These findings also underscore the necessity of viewing child-centered approaches not as standalone solutions, but as adaptable frameworks that benefit from strategic enhancement based on domain-specific learning goals.

Nonetheless, the study's findings must be interpreted with caution. The limited sample size, short three-month duration, and reliance on observer-coded data introduce constraints on generalizability and measurement precision. The lack of randomization may also have introduced selection bias. Future research should prioritize longitudinal, randomized designs with larger, more diverse cohorts and include multi-informant or standardized assessment tools to triangulate outcomes. Additionally, studies should investigate how the Reggio Emilia approach can be adapted to include structured social learning components without compromising its foundational emphasis on autonomy and expression.

In sum, while the Reggio Emilia approach shows promise for enhancing motor and emotional engagement in early childhood physical education, its broader effectiveness—particularly in fostering teamwork and social interaction—may depend on its integration with deliberate, context-sensitive instructional strategies.

References

Abudurexiti, K., & Mineo, R. (2024). Quality discourse in early childhood education and care. *European Public and Social Innovation Review*. 10, 01-15. https://doi.org/10.31637/epsir-2024-1495

Adewusi, O. E., Al Hamad, N. M., Adeleke, I. J., Nwankwo, U. C., & Nwokocha, G. C. (2023). Adaptive teaching strategies in early childhood education: a review for Nigeria and the UK. *International Journal of Applied Research in Social Sciences*, 5(8), 255-271. https://doi.org/10.51594/ijarss.v5i8.575

Baena-Morales, S., & González-Víllora, S. (2023). Physical education for sustainable development goals: Reflections and comments for contribution in the educational framework. *Sport, Education and Society*, 28(6), 697-713. https://doi.org/10.1080/13573322.2022.2045483

Bertagni, B., Gardner, R., Minehart, R., Salvetti, F. (2023). Emotional Intelligence: A Journey Inside the Emotional Life Within an Immersive Interactive Setting. In: Guralnick, D., Auer, M.E., Poce, A.

(eds) Innovative Approaches to Technology-Enhanced Learning for the Workplace and Higher Education. TLIC 2022. *Lecture Notes in Networks and Systems*, vol 581. Springer, Cham. https://doi.org/10.1007/978-3-031-21569-8_6

Bufalino, G. (2025). Caring leadership in early childhood education. *In G. Bufalino (Ed.), Pedagogies of compassion and care in education (pp. 113–130). IGI Global*. https://doi.org/10.4018/978-1-7998-7533-9.ch007

Butvilas, T., & Kovaitė, K. (2022). The expression of socio-emotional competence among younger Lithuanian adolescents as the precondition for their creativity. *Creativity Studies*, 15(2), 497-510. https://doi.org/10.3846/cs.2022.16630

Cade, J., Wardle, F., & Otter, J. (2022). Quality early care and learning: Exploring child-centered pedagogy a qualitative multi-case study. *Cogent Education*, 9(1), 2144589. https://doi.org/10.1080/2331186X.2022.2144589

Chatzipanteli, A., & Adamakis, M. (2022). Social interaction through structured play activities and games in early childhood. *In Handbook of research on using motor games in teaching and learning strategy (pp. 80-99). IGI Global*. https://doi.org/10.4018/978-1-7998-9621-0.ch005

Chiva-Bartoll, O., & Fernández-Rio, J. (2022). Advocating for Service-Learning as a pedagogical model in Physical Education: towards an activist and transformative approach. *Physical Education and Sport Pedagogy*, 27(5), 545-558. https://doi.org/10.1080/17408989.2021.1911981

Cho, M. H., Lim, S., & Niu, Z. (2025). Teacher efficacy in Reggio-inspired schools. *Journal of Early Childhood Teacher Education*. https://doi.org/10.1080/10901027.2025.2439871

Coulter, M., Britton, Ú., MacNamara, Á., Manninen, M., McGrane, B., & Belton, S. (2023). PE at Home: keeping the 'E'in PE while home-schooling during a pandemic. *Physical Education and Sport Pedagogy*, 28(2), 183-195. https://doi.org/10.1080/17408989.2021.1963425

Demirci-Ünal, Z., Tonga-Çabuk, F. E., & Tantekin-Erden, F. (2024). A learner-centered journey: pre-service early childhood teachers' learning through self-reflections and feedbacks with design-based curriculum course. *Journal of Early Childhood Teacher Education*, 1-18. https://doi.org/10.1080/10901027.2024.2362659

Dobrin, M. (2023). The educational environment in the Reggio Emilia approach. *Acta et Commentationes Sciences of Education*, 33(3), 166-174. https://doi.org/10.36120/2587-3636.v33i3.166-174

Fyffe, L. (2024). Occupational therapy embedded in early childhood education (OTEEC): Developing a population-focused, place-based approach to early intervention through occupational therapy and early childhood education center partnerships. *Journal of Occupational Therapy, Schools, & Early Intervention*, 1-21. https://doi.org/10.1080/19411243.2024.2442915

Fyffe, L., Sample, P.L., Lewis, A. et al. Entering Kindergarten After Years of Play: A Cross-Case Analysis of School Readiness Following Play-Based Education. *Early Childhood Educ Journal* 52, 167–179 (2024). https://doi.org/10.1007/s10643-022-01428-w

Gobena, G. (2024). Problems of Curriculum Relevance in Enhancing Children's Cognitive Development In Ece In Ethiopia. *International Online Journal of Primary Education*, 13(4), 287-306. https://doi.org/10.55020/iojpe.1554850

Guerrero, S., Valenciano-Valcárcel, J., & Rodríguez, A. (2024). Unveiling alternative schools: A systematic review of cognitive and social-emotional development in different educational approaches. *Children and Youth Services Review*, 158, 107480. https://doi.org/10.1016/j.childyouth.2024.107480

Guidetti, C., Müller, P.C., Magistri, P. et al. Full robotic versus open ALPPS: a bi-institutional comparison of perioperative outcomes. *Surgical Endoscopy* 38, 3448–3454 (2024). https://doi.org/10.1007/s00464-024-10804-z

Guo, K., & Rouse, E. (2024). Searching for evidence-based practice: A qualitative metasynthesis of the research on Reggio Emilia practices in Australian early years settings. *Australian Journal of Education*, 00049441241302831. https://doi.org/10.1177/00049441241302831

Jefferson-Buchanan, R. (2022). Teaching fundamental movement skills through play-based pedagogy. *Journal of Physical Education, Recreation & Dance*, 93(8), 28-33. https://doi.org/10.1080/07303084.2022.2108171

Jin, M. (2023). Preservice teachers' online teaching experiences during COVID-19. *Early Childhood Education Journal*, 51(2), 371-381. https://doi.org/10.1007/s10643-022-01316-3

Joan Stuart, M. (2024). Reignited flames: Just Early Childhood Education in neoliberal times. *Global Studies of Childhood*, 20436106241293502. https://doi.org/10.1177/20436106241293502

Knight, S., Coates, J. K., Lathlean, J., & Perez-del-Aguila, R. (2024). The development of an interdisciplinary theoretical framework for Forest School in the United Kingdom. *British Educational Research Journal*, 50(2), 905-922. https://doi.org/10.1002/berj.3953

Kondo, C. S. (2022). Walking the talk: Employing culturally relevant pedagogy in teacher education. *Teachers College Record*, 124(4), 65-94. https://doi.org/10.1177/01614681221096797

Leggett, N. Creativity in early childhood: how educators from Australia and Italy are documenting the creative thought processes of young children. *SN Social Sciences* 4, 74 (2024). https://doi.org/10.1007/s43545-024-00873-1

Lynch, S., & Ovens, A. (2022). Critical pedagogy in physical education. *In Encyclopedia of teacher education (pp. 315-319). Singapore: Springer Nature Singapore*. https://doi.org/10.1007/978-981-16-8679-5_417

Manera, L. (2022). The Reggio Emilia Approach to Early Childhood Education. An Analysis to Its Inclusive Perspectives and Their Relationships to Aesthetic Aspects. *In: Postiglione, E. (eds) Fostering Inclusion in Education. Palgrave Macmillan*, *Cham*. https://doi.org/10.1007/978-3-031-07492-9_7

Mattiolo, D., Mazzuoccolo, G., Rajník, J., & Tabarelli, G. (2024). A lower bound for the complex flow number of a graph: A geometric approach. *Journal of Graph Theory*, 106(2), 239-256. https://doi.org/10.1002/jgt.23075

McInnes, E., Whitington, V., Neill, B., & Farndale, A. (2024). Professional learning supporting multilingual children's social and emotional development in diverse Australian early childhood education and care settings. *Early Childhood Education Journal*, 1-12. https://doi.org/10.1007/s10643-023-01620-6

Mligo, I. R. (2024). Perspectives on early childhood curriculum development. *Early Years*, 44(3), 355–370. https://doi.org/10.1080/09575146.2024.2325997

Mohammed, S., Afaya, A., & Abukari, A. S. (2023). Reading, singing, and storytelling: the impact of caregiver-child interaction and child access to books and preschool on early childhood development in Ghana. *Scientific Reports*, 13(1), 13751. https://doi.org/10.1038/s41598-023-38439-5

Nores, M., Mesa, N., & Vega, H. (2021). Reaching thousands of children in low-income communities with high-quality ECED services: A journey of perseverance and creativity. *Frontiers in Public Health*, 9, 637031. https://doi.org/10.3389/fpubh.2021.637031

Omarov, B., Omarov, B., Rakhymzhanov, A., Niyazov, A., Sultan, D., & Baikuvekov, M. (2024). Development of an artificial intelligence-enabled non-invasive digital stethoscope for monitoring the heart condition of athletes in real-time. *Retos, 60*, 1169–1180. https://doi.org/10.47197/retos.v60.108633

Omarov, N., Omarov, B., Azhibekova, Z., & Omarov, B. (2024). Applying an augmented reality game-based learning environment in physical education classes to enhance sports motivation. *Retos, 60*, 269–278. https://doi.org/10.47197/retos.v60.109170

Qayyum, A., Fatima, R., & Iram, A. (2024). Play-Based Learning and Child Cognitive-Emotional Development in Nature-Based Programs. *Annals of Human and Social Sciences*, 5(4), 348-365. https://doi.org/10.35484/ahss.2024(5-IV)33

Rigney, L. I., & Rinaldi, C. (2023). Teaching in cultural and linguistic super-diverse Australian classrooms: A north–south exploration of Reggio Emilia. *In Affirming the Rights of Emergent Bilingual and Multilingual Children and Families* (pp. 209-225). Routledge.

Rinaldi, C. (2022). 14 Early Childhood Education in Reggio Emilia and in The World. *In Education: A Global Compact for a Time of Crisis (pp. 259-274). Columbia University Press*. https://doi.org/10.7312/suar20434-017

Rolina, N. (2023, January). Implementation of EoREA'S Model for Child Independence Development. *In Unima International Conference on Social Sciences and Humanities (UNICSSH 2022)* (pp. 428-435). Atlantis Press. https://doi.org/10.2991/978-2-494069-35-0_53

Tóth-Király, I., Durand, A. B., Houle, S. A., Fernet, C., Gilbert, W., Blechman, Y., & Morin, A. J. (2024). Early Career Nurses' Need Fulfillment Profiles: A Longitudinal Person-Centered Perspective on their Nature, Stability, Determinants and Consequences. *Journal of Business and Psychology*, 39(3), 735-754. https://doi.org/10.1007/s10869-023-09905-8

Uebernickel, F., Thong, C. (2022). Contextualizing Design Thinking with Multiple Intelligences: The Global SUGAR Program as a Case. In: Meinel, C., Krohn, T. (eds) *Design Thinking in Education.*

Springer, Cham. https://doi.org/10.1007/978-3-030-89113-8_17

Vissing, Y. (2023). Education: A Children's Human Rights Framework Example. *In: Children's Human Rights in the USA. Clinical Sociology: Research and Practice. Springer, Cham*. https://doi.org/10.1007/978-3-031-30848-2_18

Wang, C. (2022). The role of physical activity promoting thinking skills and emotional behavior of preschool children. *Psicologia: Reflexão e Crítica*, 35, 24. https://doi.org/10.1186/s41155-022-00223-1

Whewell, E. (2022). Primary Physical Education Teacher Identity. *In: Peters, M.A. (eds) Encyclopedia of Teacher Education. Springer, Singapore*. https://doi.org/10.1007/978-981-16-8679-5_344

Worku, M. Y. (2025). Appropriateness of learning environments in preprimary educational institutions: the case of preschools in Bahir Dar city, Ethiopia. *International Journal of Child Care and Education Policy*, 19(1), 1. https://doi.org/10.1186/s40723-025-00140-7

Yufiarti, Y., Erik, E., Fidesrinur, F., Rosalinda, I., & Garzia, M. (2022). Reggio Emilia's Philosophy Approach; Environment as a Third Teacher in Child Potential Development in ECCE Institutions. *International Journal of Multicultural and Multireligious Understanding*, 9(6), 564-575. http://dx.doi.org/10.18415/ijmmu.v9i9.3949

Zhang, Q., Yin, J. & Jiang, K. Glocalization of early childhood curriculum: an ethnographic study on the integration of the Reggio Emilia approach into the Chinese Kindergarten curriculum. *Asia Pacific Educ. Rev.* (2023). https://doi.org/10.1007/s12564-023-09851-3

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