

Original Research Article

From Dance Floors to Playgrounds: Improving Eye-Foot Coordination with Southeast Asian Traditions

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Abstract: In the modern digital era, where students spend long hours in front of screens and less time being physically active, the acquisition of fundamental motor skills—specifically eye-foot coordination—is usually overlooked. This research explores culturally embedded activities as potential alternatives by examining the effectiveness of Southeast Asian traditional dances and games as interventions to enhance eye-foot coordination among Grade 10 students. Using a quasi-experimental design, 69 students were divided into two groups: Group A (n=34) participated in traditional dances (Tinikling, Kuda Lumping, Palikatri) while Group B (n=35) engaged in traditional games (Chinlone, DaCau, Patintero). Eye-foot coordination was assessed using Johnson's Soccer Wall-Volley Test, both before and after intervention. Findings revealed that both interventions led to significant improvements in eye-foot coordination, with the traditional dances performing slightly better, as indicated by a mean increase from 28.40 to 35.90 in the posttest, compared to games, which showed a mean increase from 28.70 to 34.80 in the posttest. The research validated theories on Game-Based Learning, Sensory-Motor Theory, and Social Constructivism, highlighting the significance of structured rhythmic activities in enhancing motor skills. These findings promoted the inclusion of traditional Southeast Asian activities in physical education programs to foster motor development and cultural participation.

Keywords: Eye-foot coordination, Southeast Asia, traditional dances, traditional games, quasi-experimental design

Introduction

Eye-foot coordination remained a critical skill essential in various physical activities, including sports, dance, and daily functional movements (Barnes *et al.*, 2024; Doe & Smith, 2018). It facilitated individuals' ability to synchronize visual perception with precise foot movements, significantly contributing to agility, balance, motor control, and injury prevention (Basman & Gunawan, 2021; Ramli *et al.*, 2023). However, with the proliferation of digital screen usage, particularly among adolescents in the Philippines, where mobile device use accounted for about 32.5% of daily activities (Navarro, 2024), concerns about declining physical competencies, particularly motor coordination skills, escalated (Fadhli *et al.*, 2022). Addressing this deterioration became crucial in promoting public health, enhancing sports development, and enriching educational programs.

This study investigated the measurable improvement in eye-foot coordination through culturally embedded interventions that incorporated Southeast Asian traditional dances and games. Despite the known negative impact of high-speed digital gaming on visual processing and neuromotor responses (West *et al.*, 2020), few studies have quantitatively examined alternative interventions aligned with cultural and educational goals.

Prior quantitative research confirmed that structured physical activities, such as dance and game-based training, significantly improved motor skills, proprioception, and spatial awareness (Norouzi *et al.*, 2019; Sintia *et al.*, 2022). Traditional Southeast Asian

activities, such as Tinikling, Kuda Lumping, Chinlone, and Patintero, offered dynamic footwork patterns that demanded coordination and sensory-motor integration (Aung-Thwin, 2020; Santos *et al.*, 2019). However, there remained a scarcity of controlled experimental designs quantifying these activities' specific effects on eye-foot coordination.

Although the cultural and physical benefits of Southeast Asian traditional activities have been acknowledged (Franco *et al.*, 2022; Rosala & Budiman, 2020), empirical validation through quasi-experimental methods has been lacking. This gap highlighted the need to scientifically validate the role of culturally relevant interventions in contemporary educational settings.

The purpose of this quantitative study was to determine the effectiveness of Southeast Asian traditional dances and games in enhancing the eye-foot coordination of Grade 10 students. The independent variable was the type of intervention (traditional dances versus traditional games), and the dependent variable was the eye-foot coordination performance measured through the Soccer Wall-Volley Test.

This study addressed three research questions: (1) How did participants in each group perform in the pretest and posttest in terms of eye-foot coordination? (2) Did each group's performance significantly improve from pretest to posttest? (3) Was there a significant difference in the increments of improvement between the two groups? The following hypotheses were tested: Ho1: There was no significant difference between the pretest and posttest within each group; Ho2: There was no significant difference between the groups in terms of performance increment.

The findings contributed to theory by supporting frameworks such as Game-Based Learning (Gee, 2003), Sensory-Motor Theory (Todd *et al.*, 2015), and Social Constructivism (Vygotsky, 1978). Practically, the results informed curriculum developers, educators, and policymakers about culturally relevant methods for improving motor skills. The study emphasized that integrating traditional activities into physical education curricula could simultaneously develop motor competence and cultural appreciation.

The study was delimited to Grade 10 students in a private sectarian school in Misamis Oriental during the 2024–2025 academic year. It employed a quasi-experimental design with a five-week intervention period, focusing on Southeast Asian traditional dances and games as primary interventions to enhance eye-foot coordination.

Methods and Materials

This study employed a quasi-experimental pretest-posttest non-equivalent groups design. A quasi-experimental design was appropriate due to the use of intact heterogeneous classes, which made randomization impractical yet allowed for comparisons between distinct intervention groups (Reichardt *et al.*, 2023).

Participants included 69 Grade 10 students, ages 15–16, from a private sectarian school in Misamis Oriental. Group A consisted of 34 students assigned to traditional dance interventions (Tinicling, Kuda Lumping, Palikatri) and Group B of 35 students assigned to traditional games (Chinlone, DaCau, Patintero). Convenience sampling was utilized. The inclusion criteria were Grade 10 enrollment, physical fitness, and parental consent; students with injuries or disabilities that affected motor function were excluded.

Prior to the intervention, both groups underwent a pretest using the Soccer Wall-Volley Test (Johnson, 1963) to establish baseline measurements of their eye-foot coordination. This validated tool has a test-retest reliability coefficient of 0.97 (Daneshjoo *et al.*, 2013). Participants volleyed a soccer ball against a wall for 30 seconds, and the number of successful volleys minus faults across three trials was recorded. Standardized instructions were used to minimize bias.

Group A participated in a structured five-week program that focused on traditional Southeast Asian dances. The intervention was conducted in the school's gymnasium under standardized conditions, with two sessions per week. Each session lasted approximately 45 minutes, including warm-up and cool-down routines. The dance activities were delivered sequentially, one per week. In Week 1, students learned the basic movements of Tinikling, a Filipino folk dance, and performed it in Week 2. In the same week, they were introduced to Kuda Lumping, a traditional Indonesian dance that they rehearsed and performed in Week 3. Week 4 was dedicated to learning Palikatri, a traditional dance form that involves synchronized footwork, culminating in a performance task in Week 5. Each session focused solely on one dance form, allowing students adequate time for skill development and mastery.

Group B followed the same session structure and schedule as Group A, but focused on traditional Southeast Asian games. In Week 1, students were introduced to Chinlone, a Myanmar-based game that involves juggling a rattan ball with the feet. A

performance task was followed in Week 2, alongside the introduction of Da Cau, a Vietnamese foot badminton game. Students practiced and performed Da Cau in Week 3. In Week 4, they learned Patintero, a traditional Filipino game that emphasizes agility and coordination. This game was practiced throughout the week and performed in Week 5. Like Group A, each session for Group B focused on one game at a time, allowing structured and progressive skill development.

At the end of the five-week intervention, all participants underwent a posttest using the same Soccer Wall-Volley Test used in the pretest. This was done to determine any improvements in their eye-foot coordination following the intervention. Testing conditions and instructions were kept consistent with the pretest to ensure reliability and minimize bias.

Descriptive statistics, including means and standard deviations, were computed to summarize performance results. A Paired Sample t-test was used to analyze within-group differences between pre- and posttest scores. Additionally, ANCOVA was employed to compare posttest results between Group A and Group B, using pretest scores as covariates to control for baseline differences. Statistical significance was set at $p < .05$, allowing for a rigorous comparison of the effectiveness of the two interventions on improving eye-foot coordination.

Results

Data collected from the Soccer Wall-Volley Test (Johnson, 1963) pretest and posttest are organized using tables (*see p. 25*) according to the three research questions. Table 1 shows the descriptive statistics for pretest and posttest scores of each group. Group A (Dance) had a pretest mean score of 28.40 (SD = 6.36) and a posttest mean score of 35.90 (SD = 6.10). Group B (Games) had a pretest mean score of 28.70 (SD = 5.59) and a posttest mean score of 34.80 (SD = 5.35).

Table 2 presents the results of the paired sample t-test comparing pretest and posttest scores within each group. The paired sample t-test indicated that both groups demonstrated statistically significant improvements, with t-values of 50.60 and 37.60, respectively, and p-values < 0.001 , thus, rejecting the null hypothesis (H_{01}), which stated that there is no significant difference in the eye-foot coordination test results of the two groups during the pretest and posttest.

Table 3 shows the ANCOVA results, comparing posttest scores between the groups while controlling for pretest scores. The ANCOVA results revealed a significant group effect ($F(1, 66) = 41.60, p < .001$). The posttest comparison indicated that Group A (Dance) performed better than Group B (Games) by a mean difference of 1.10 points, leading to the rejection of H_{02} . Partial eta squared ($\eta_p^2 = 0.39$) also indicates a large effect size. Thus, traditional dances were more effective in enhancing eye-foot coordination than traditional games.

Discussion

The major findings of this study indicated that both the dance group and the games group demonstrated significant improvements in eye-foot coordination from pretest to posttest. The null hypothesis H_{01} , which stated that there is no significant difference in the eye-foot coordination test results of both groups during the pretest and posttest, was rejected. Moreover, a significant difference was found between the two groups' posttest results, leading to the rejection of H_{02} . Traditional dances were found to be more effective than traditional games in enhancing eye-foot coordination.

The results suggest that participation in both Southeast Asian traditional dances and games positively influenced students' eye-foot coordination. These findings align with prior studies that emphasized the importance of rhythmic, movement-based activities in motor coordination development (Ramli *et al.*, 2023; Rosniawati *et al.*, 2024; Sintia *et al.*, 2022). The structured and rhythmic nature of dances such as Tinikling and Kuda Lumping likely provided more consistent motor learning opportunities compared to the more reactive and unpredictable movements required in traditional games like Chinlone and Patintero (Douka *et al.*, 2019; Wołoszyn *et al.*, 2021).

For Problem 1, the descriptive findings revealed that both the dance and games groups showed improvements in eye-foot coordination from pretest to posttest, aligning with previous studies that emphasized the positive effects of rhythmic activities and structured play on neuromuscular adaptation (Norouzi *et al.*, 2019; Wołoszyn *et al.*, 2021). This affirms that traditional movement practices, whether dance- or game-based, stimulate improvements in motor coordination.

For Problem 2, the Paired Sample t-Test results confirmed significant improvements within each group from pretest to posttest. This supports existing evidence that structured physical activities enhance coordination skills through consistent sensory-motor engagement (Douka *et al.*, 2019; Sintia *et al.*, 2022). Both interventions—traditional dances and traditional games—proved

effective, underscoring that even culturally diverse movement activities can be vital components of motor skills development programs (Franco *et al.*, 2022; Rosniawati *et al.*, 2024).

For Problem 3, the ANCOVA results demonstrated a significant difference favoring traditional dance over games, suggesting that repetitive, rhythmically patterned movement may be more beneficial for developing eye-foot coordination. This finding complements earlier works on the superiority of rhythmic structured activities for motor learning (Todd *et al.*, 2015; Wołoszyn *et al.*, 2021). Traditional dances such as Tinikling and Kuda Lumping provided regular, predictable patterns that may have better reinforced neuromuscular efficiency compared to the dynamic, less predictable movement in games like Patintero and Chinlone (Sintia *et al.*, 2022; Wahyuniati *et al.*, 2023).

These findings corroborate the Sensory-Motor Theory (Todd *et al.*, 2015), which posits that consistent sensory input synchronized with motor output enhances motor learning and control. The results also support Social Constructivism Theory (Vygotsky, 1978), showing that collaborative learning in traditional dances enhanced not only motor skills but also cultural engagement. Furthermore, Game-Based Learning Theory (Gee, 2003) is partially supported, as game interventions yielded improvements, although to a lesser extent compared to dance-based interventions.

This study highlights the potential for integrating Southeast Asian traditional dances and games into physical education curricula to promote motor skill development and cultural appreciation (Franco *et al.*, 2022; Rajarajan & Palanikumar, 2023). Educators, practitioners, and curriculum developers could use these findings to design culturally enriched physical activities that also serve developmental purposes.

Conclusion

The purpose of this study was to evaluate and compare the effectiveness of Southeast Asian traditional dances and games in enhancing the eye-foot coordination of Grade 10 students. The study specifically addressed the gap concerning the quantitative impact of traditional movement-based activities on coordination.

Both groups showed significant improvements in eye-foot coordination from pretest to posttest, supporting the rejection of H_{01} . Furthermore, ANCOVA analysis revealed a significant difference favoring the dance group, leading to the rejection of H_{02} . Thus, traditional dances proved more effective than traditional games in enhancing eye-foot coordination.

The findings contribute to the growing body of evidence supporting the use of culturally relevant physical activities to enhance motor skills. Integrating Southeast Asian traditional dances and games into educational curricula can serve as a valuable approach for fostering both motor development and cultural appreciation among students.

While this study offers meaningful insights, it is limited to a relatively short intervention period and the specific sample of Grade 10 students from a single private school. Future research should explore longer intervention periods, larger and more diverse populations, and alternative coordination measurement tools.

Future studies may also investigate variations in intervention intensity, the effects of hybrid dance-game programs, and longitudinal impacts on coordination and physical fitness.

This study highlights the promise of culturally grounded movement activities in education, paving the way for broader inclusion of traditional arts in physical education for holistic student development.

Conflict of Interest: *The authors declare that there is no conflict of interest regarding the publication of this article.*

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Ethical Approval: The study was reviewed and approved by the institutional Ethics Committee of the researcher's academic institution, adhering to the ethical standards outlined in the Belmont Report. Informed assent was obtained from all student participants, alongside written parental consent, ensuring full ethical compliance and respect for participant rights.

AI Declaration: This study utilized artificial intelligence tools to assist in the preparation of this article. Specifically, ChatGPT was used to convert the full thesis manuscript into a concise journal article format with human supervision and critical editing to maintain academic rigor and integrity. Additionally, Grammarly AI was employed to enhance the language clarity, tone, and grammatical quality of the final manuscript. All AI-generated outputs were thoroughly reviewed, verified, and edited by the authors to ensure scholarly standards were upheld.

Data Availability Statement: The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

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Table 1

Descriptive Statistics of Pretest and Posttest Scores by Performance Category for Southeast Asian Traditional Dances and Games

Range	Description	Group A (Southeast Asian Traditional Dances)				Group B (Southeast Asian Traditional Games)			
		Pretest		Posttest		Pretest		Posttest	
		f	%	F	%	f	%	f	%
> 42	Outstanding	0	0.0	7	20.0	0	0.0	4	11.4
37 41	Very Good	5	14.7	9	26.5	3	8.6	11	31.4
31 36	Good	8	23.5	9	26.5	11	31.4	9	25.7
25 30	Fair	10	29.4	9	26.5	11	31.4	11	31.4
< 24	Poor	11	32.3	0	0.0	10	28.6	0	0.0
TOTAL		34	100.0	34	100.0	35	100.0	35	100.0
Mean		28.40		35.90		28.70		34.80	
Description		Fair		Good		Fair		Good	
Standard Deviation		6.36		6.10		5.59		5.35	

Table 2

Paired Samples T-test Results Comparing Pretest and Posttest Scores for Southeast Asian Traditional Dances and Games

Groups	Pretest		Posttest		df	t	p
	M	SD	M	SD			
Southeast Asian Traditional Dances	28.40	6.36	35.90	6.10	33	50.60*	<.001
Southeast Asian Traditional Games	28.70	5.59	34.80	5.35	34	37.60*	<.001

* Significant at 0.05 level.

Table 3

Analysis of Covariance Results for Posttest Scores Controlling for Pretest

Groups	Pretest		Posttest		F(1,66)	p	η_p^2
	M	SD	M	SD			
Southeast Asian Traditional Dances	28.40	6.36	35.90	6.10	41.60*	<.001	0.39
Southeast Asian Traditional Games	28.70	5.59	34.80	5.35			

*Significant at 0.05 level.