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Implementation of rhythmic activities to improve motor movement and social skills

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Abstract

Research Problems: The lack of activities that support optimal physical and social development so that students' motor movements and social skills are less developed. **Methods:** This study uses a quantitative approach with a One Group Pretest Posttest design. The hypothesis test was carried out using the Paired Sample T-test to determine the effect of the implementation of the Rangku Alu archipelago game on the improvement of students' motor movements and social skills. **Results:** In the aspect of students' motor skills, the results of the statistical test showed a minimum score of 82 and a maximum score of 100. The significance value is 0.000 < 0.05 and the value is $t_{\text{hitung}} > t_{\text{tabel}}$ (36.795 > 2.022). Meanwhile, in the aspect of social skills, in Observation 1, the minimum score is 46.66 to a maximum of 66.66 while in Observation 4, the increase in data is very clear with the minimum score at 80 and the maximum score at 91.66 and the score $t_{\text{hitung}} > t_{\text{tabel}}$ (38,242 > 2.022), so there is a significant influence on improving students' motor movement and social skills. **Conclusion:** Through the game of Rangku Alu which is integrated with the song Manuk Dadali, the activity of jumping, changing positions, and responding to rhythmic movement challenges on the sidelines of bamboo blades becomes effective stimulation in shaping students' motor movements. In addition to improving physical abilities, the game also optimizes students' social skills indicators through fun real-life experiences including improvements in relationships with peers, self-management skills, adherence to rules, and the formation of assertive behaviors.
Keywords: Rhythmic Activity; Motor Movement; Social Skills; Rangku Alu; Elementary School Student

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INTRODUCTION

Elementary school is an important phase in a child's development because at this stage there is rapid development in physical, cognitive, social, and emotional aspects (Yuliarsih et al., 2024). In this phase, children experience an increase in logical thinking skills, more mature coordination of movements, and increasingly complex social interaction skills (Zakiyah et al., 2024). Therefore, the learning process should not only be oriented towards achieving academic abilities, but also need to provide a learning experience that is able to develop motor skills and social skills in a balanced manner. The development of these aspects is important because it is the basis for students to actively participate in learning activities, interact with peers, and adapt to their social environment. When the development of these aspects is not balanced, it will have an impact on the suboptimal development of the individual (Rusdiyanti et al., 2025).

However, learning in elementary school is still dominated by activities that are oriented towards academic achievement, so students' opportunities to carry out structured and meaningful physical activities are still relatively limited. In fact, the characteristics of elementary school students show that they tend to like play, movement, and learning through hands-on experience (Wiyarko & Adhi, 2025). This condition causes stimulation of the development of motor movements and social skills to not take place optimally in the learning process.

The results of initial observations made on fourth grade students of SD Negeri 1 Balerante show that students' motor movement skills still need to be improved. The percentage of walking ability reached 82.4%, running 88.8%, while jumping ability only reached 79.2%. Furthermore, around 48% of students still have difficulty landing after jumping because they tend to use one leg so that their balance is not optimal. In addition, students' social skills also still need development. Although the indicators of peer relationships, self-management, compliance, academic ability, and assertive behavior are in the good category, as many as 68% of students still choose certain friends when working together so that social interaction between students has not developed optimally. This condition shows the need for a learning innovation that is able to develop motor movements and social skills at the same time.

One feasible alternative is to integrate traditional games in rhythmic activities. Traditional games are the nation's cultural heritage that not only functions as a means of entertainment, but also has educational value because it contains elements of cooperation, communication, discipline, responsibility, sportsmanship, and social interaction (Iwandana et al., 2021). In addition, traditional games involve various movement activities that are in accordance with the developmental characteristics of elementary school students so that they have the potential to be an effective learning medium in developing physical and social abilities.

Among the various games of the archipelago, Rangku Alu is a traditional game that has unique characteristics because it combines movement activities with rhythm (Khodari & Nurhidayah, 2025). This game requires students to perform jumping movements following the opening and closing of the bamboo rhythmically so that it demands coordination of movement, balance, agility, precision of steps, and the ability to control the body (Wardhana, 2026). At the same time, the students in charge of moving the bamboo

must work together, communicate, and coordinate their movements with other group members. Thus, the game of Rangku Alu naturally involves the development of motor movement skills as well as social skills in one learning activity.

The effectiveness of the Rangku Alu game is expected to be more optimal when combined with rhythmic activities using song accompaniment. Rhythmic activities are movement activities that are carried out according to a certain tempo or rhythm so as to help students develop coordination, balance, concentration, and movement control in a more structured manner (Liana et al., 2022). In this study, the song Manuk Dadali was used as an accompaniment to rhythmic activities because it has a stable tempo and contains cultural values that can strengthen learning based on local wisdom. The integration of traditional games with regional songs is expected not only to improve the quality of students' movements, but also to create a more fun, meaningful, and contextual learning experience.

Various previous studies have shown that traditional games are able to improve students' social skills through increased cooperation, communication, and emotional management (Widyananti & Winanto, 2024). Other research shows that rhythmic activity has a positive effect on students' movement coordination, learning motivation, and physical fitness (Siregar et al., 2024). In addition, the game of Rangku Alu has also been proven to be able to improve gross motor skills, especially balance, coordination, and agility of children (Prima & Lestari, 2025). The results of these studies show that traditional games and rhythmic activities have great potential in supporting student development.

However, there are still research gaps that need to be studied further. Most previous research has only focused on improving motor abilities or social skills separately. Research on rhythmic activities generally focuses more on improving physical abilities, while research on traditional games examines its effect on only one aspect of development. Until now, there is still very limited research that integrates the Rangku Alu game, rhythmic activities, and the accompaniment of the Manuk Dadali song as an alternative learning to improve motor movements and social skills of elementary school students simultaneously.

The novelty of this research lies in two main aspects. First, this study develops culture-based learning by integrating the traditional game of Rangku Alu, rhythmic activities, and Manuk Dadali songs in a single learning activity. Second, this study not only measured the

improvement of motor movement ability or social skills separately, but evaluated both aspects simultaneously.

Based on this description, this study aims to analyze the influence of the implementation of rhythmic activities through the Nusantara Rangku Alu game combined with the song Manuk Dadali on the improvement of motor movements and social skills of elementary school students.

METHOD

Study organization

This study uses a quantitative approach with a pre-experimental method. The research design used is One Group Pretest Posttest, which is a study involving one group of subjects who are given a test before after treatment.

Study participants

All grade IV students at SD Negeri 1 Balerante with a total of 75 students became the population in this study. The sampling technique uses stratified random sampling with random sampling based on the existing groups, namely groups 4A, 4B, and 4C. From this technique, a sample of 40 students was obtained at random who were considered to be representative or could represent the characteristics of the research population.

Research Procedure

Table 1. Research Procedure

Meetings	Activity Stage	The Role of the Researcher	Development Focus	Evaluation
1 (pretest) with a duration of 2 hours	Carry out preliminary tests using TGMD-2 which includes locomotor skills (running, gallop, hop, leap, horizontal jump,	Explain test procedures, demonstrate each skill, supervise the execution of the test, and record each student's score.	Identify the initial gross motor movement ability of students.	Motor motion pretest scores using TGMD-2.

	slide) and object control (hitting a stationary ball, dribble, catching, kicking, throwing, rolling the ball).			
2 (Orientation and treatment 1) with a duration of 2 hours	The researcher introduced rangku pestle and manuk dadili songs, explained the rules of the Rangku Alu game, demonstrated how to play, then students conducted initial experiments of the game.	Explain the rules, demonstrate the game, organize the group, provide examples of movements, guide students to follow the rhythm of the song, and begin to observe the students' social skills.	Introduction to games, movement adaptation, initial coordination, and social interaction between students.	Social skills observation 1.
3 (treatment 2) with a duration of 2 hours	Students play the game of Rangku Alu with the accompaniment of the song Manuk Dadali. Some students still get guidance in adjusting the jump to the tempo of the song.	Provide direction, correct movements, maintain security, motivate students, and observe social skills.	**Motor:** coordination, jumping, balance, agility, precision following rhythm. **Social:** peer relationships, self-management, academic ability,	Observation of social skills 2.

			compliance, assertive behavior.	
4 (treatment 3) with a duration of 2 hours	Students begin to get used to playing Rangku Alu and follow the rhythm of the song better through group games.	Gradually reduce assistance, provide feedback, correct movement errors, and observe students' social development.	Improving movement coordination and improving the quality of social interaction.	Observation of social skills 3.
5 (treatment 4) with a duration of 2 hours	Students play Rangku Alu more independently according to the rules of the game with the accompaniment of the song Manuk Dadali.	Acting as a facilitator, making sure the game runs according to the rules, providing reinforcement, and making final observations of social skills.	Strengthening motor movements and social skills through repeated play experiences.	Observation of social skills 4.
6 (posttest) with a duration of 2 hours	Perform the final test using TGMD-2 with the same procedure as the pretest.	Supervise the implementation of the test and record the scores of each student.	Identify changes in motor mobility ability after the intervention.	Motor motion posttest scores using TGMD-2.

Instrument

The instrument used is *the Test of Gross Motor Development (TGMD-2)* to measure students' motor movements with a value of 1 if the student can do it and 0 if the student cannot do it. A questionnaire to measure the level of students' social skills after participating in the activity. The questionnaire is arranged based on a likert scale with a score range of 1 to 4, so

that it can describe the level of student agreement with the statements given. Observation sheets are used to see students' social skills as activities take place. The documentation is used to complete the research data which contains a list of student names, photos of activities, and other documents.

To ensure the quality of the instrument, validity tests are carried out so that the data collected is objective and accurate before being applied to the research sample. The motor motion test instrument in this study uses TGMD-2. The instrument is a standard instrument that has been widely used to measure the gross motor movement ability of children aged 3-10 years and has been tested. Therefore, the researcher did not conduct a validity test of the motor motion test instrument.

Meanwhile, the questionnaire instruments and social skills observation sheets were adapted from previous research that had gone through a validity test. Here are the results.

Table 2. Questionnaire Validation Results

No.	Validation	Percentage	Follow-up
1.	Validator 1 (Grade 5 teacher)	90%	Worthy of revision
2.	Validator 2 (PJOK Teacher)	95%	Worth using
3.	Validator 3 (Lecturers)	95%	Worth using

Based on the accumulated percentage of the three experts, all of whom are in the very feasible category with a percentage of 93.33%, it can be concluded that this questionnaire instrument and observation sheet as a whole has met the requirements for the validity of the content and is declared very feasible to be used after minor improvements are made according to the advice of experts.

Statistical analysis

Motor movement data and social skill observation were analyzed using the Shapiro-Wilk normality test. The use of Shapiro-Wilk is because the number of research samples is only 40 students so it is more suitable for use (Rahman et al., 2025). The normality test is carried out to find out whether the data is normally distributed or not as a condition for using the parametric statistical test. After that, a Paired Sample T-test is carried out with the criterion that if the significance value is < 0.05, Ha is accepted, but if the significance value is > 0.05, then Ha is rejected. Meanwhile, social skills questionnaire data is calculated by students and

then analyzed using descriptive statistics to determine the minimum, maximum, and average scores. To see the category, the questionnaire data is converted into percentages.

RESULT

1. Motor Movement Skills

Normality Test

Table 3. Normality Test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	132	40	,078	,956	40	,124
Posttest	148	40	,027	,955	40	,116

Table 3. presents a significance value of pretest and posttest data greater than 0.05, so that the data is normally distributed and suitable for future statistical analysis.

Uji Hypothesis

Table 4. Hypothesis Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Posttest	-8,10000	1,39229	,22014	-8,54527	-7,65473	-36,795	39	,000

Based on Table 4. shows that the mean difference between the pretest and posttest data is -8.10000, with Std. Deviation was 1,39229. The minus value of this *mean* indicates that there is a tendency to increase the real score from before the treatment to after the treatment.

Proof of hypothesis statistically can be seen through the Sig. (2-tailed) column of 0.000. In addition, the test can also be strengthened through the comparison of values

$t_{\text{hitung}}\ dan\ t_{\text{tabel}}$. $Values\ t_{\text{hitung}}$ which is obtained as much as -36.795 with a ($df = N - 1$) of 39. At the significance level $\alpha = 0{,}05$, the value t_{tabel} for df =39 is 2.022. Thus, the value $t_{\text{hitung}} > t_{\text{tabel}}$ (36,795 > 2,022).

Based on these two decision-making indicators, the decision of this statistical test is to accept Ha1 and that there is a significant influence of the implementation of rhythmic activities through the Nusantara Rangku Alu game in improving the gross motor movement ability of grade IV students at SD Negeri 1 Balerante. This increase in physical ability proves that varied and dynamic rhythmic movement interventions are significantly able to train kinesthetic function and motor coordination of elementary school-age children.

2. Social Skills

Normality Test

Table 5. Normality Test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Observasi1	,123	40	,128	,963	40	,218
Observasi4	,124	40	,125	,955	40	,112

Based on Table 5. it shows that the data of observation 1 (pretest) and observation 4 (posttest) of social skills obtained a significance of > 0.05 which means that the data is distributed normally and suitable for further analysis.

Uji Hypothesis

Table 6. Hypothesis Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Observasi1 - Observasi4	-17,35000	2,86938	,45369	-18,26767	-16,43233	-38,242	39	,000

The table above, obtained a *Paired Differences Mean* value of -17,35000. Furthermore, this test produces a statistical calculation value of ($t = -38{,}242$), so $t_{\text{hitung}} > t_{\text{tabel}}$ that the value ($38{,}242 > 2.022$). Because of the value Sig. $< 0{,}05$, Ha_2 is accepted. Thus, there is a very significant difference between the value of the results of Observation 1 and Observation 4, which proves that the treatment or changes that occurred during the observation period have succeeded in improving significantly. The increase in the value can be illustrated in the form of the following diagram.

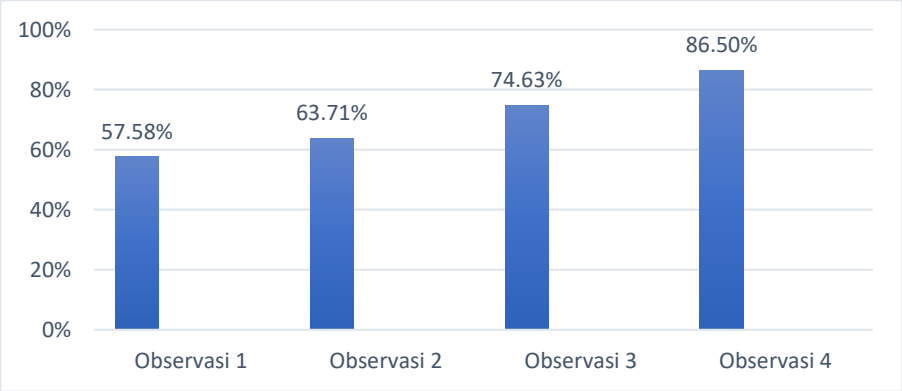


Figure 1. Improvement of Observation Results

Based on Figure 1. There was an improvement in students' social skills at each meeting during the implementation of the Rangku Alu game. In the first observation, the percentage of students' social skills reached 57.58%, then increased to 63.71% in the second observation. Furthermore, in the third observation the percentage increased to 74.63%, and in the fourth observation it reached 86.50%.

This increase shows that the application of the Rangku Alu game has a positive influence on the development of students' social skills. The more often students participate in game activities, the better their social skills will be.

In order to strengthen the analysis of social skills data, the researcher added supporting data in the form of questionnaires of respondents' experiences after playing the Rangku Alu game. The description of the questionnaire results data can be seen in the table below

Table 7. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation

Questionnaire	40	50,00	60,00	54,9500	2,26399
Valid N (listwise)	40				

Based on table 7, it shows a minimum value of 50, a maximum value of 60, and an average value of 54.9500. In addition, the standard deviation value of 2.26399 indicates that the distribution of data is relatively small or not very varied. The results of the data are still in the form of raw data so they must be changed to percentages. According (Fernandez et al., 2021) to the change in the score, it follows the formula as follows.

$$P = \frac{n}{N} \times 100\%$$

Description:

P= Percentage value (%)

n= Total score obtained

N= Jumlah score maximum

Based on this formula, all raw data of the questionnaire score will be converted into a percentage. These data changes include a minimum score from 50 to 83.33%, a maximum score from 60 to 100%, and an average score from 54.95 to 91.58%. The main goal is to standardize the data units, making it easier for researchers to determine the position and interpret the data according to the following category tables.

Table 8. Category Shoes

Score Range	Category
66,68% - 100%	Height
33,34% - 66,67%	Medium
0,00% - 33,33%	Low

(Dian Pratiwi et al., 2021)

Referring to Table 8, the average percentage score of 91.58% shows that the results of the social skills questionnaire of students are in the high category. The achievement of this percentage indicates that students' social skills in general have developed very well. In addition, the minimum score of respondents at 83.33% has also exceeded the minimum limit of the high category. Thus, all students have uniform social skills at a high level after the implementation of the pestle range game.

DISCUSSION

1. Increased Motor Motion

This study shows that the implementation of rhythmic activities through the Rangku Alu game is able to improve the motor movement ability of elementary school students. The improvement shows that games that integrate physical activity, rhythm, and culture are able to provide stimulation of movements that are in accordance with the characteristics of children's development. The changes in motor skills that occurred after the treatment indicated that the movement experience given during the game was able to optimize the student's locomotor skills and movement control.

The improvement in motor movement skills occurs because the Rangku Alu game requires students to perform various movements repeatedly with a high level of coordination. During the game, students must determine the right time to jump, adjust their steps to the bamboo movements, maintain their balance when landing, and immediately move following the change in the position of the bamboo. The activity involves coordination between vision, the body's balance system, and large muscle movements so that students continue to make direct movement adjustments. The repetition of movements carried out in each activity causes students to be more able to control body position, increase the timing of movements, and reduce errors when making jumps (Setiawan, 2025).

The use of the song as part of rhythmic activities also contributes to improving motor movement skills (Fadillah Siregar et al., 2024). In this study, the song not only functions as an accompaniment to the game, but is used as a tempo regulator that becomes a reference for students to determine when to start jumping and when to adjust the steps to the movement of the bamboo. These rhythmic cues help students predict the time of movement so that the synchronization between perception and movement becomes better. When movements are performed at a consistent tempo, coordination, balance, agility, and accuracy of movements develop more optimally than when the game is played without a structured rhythm.

The findings are in line with the theory of motor development put forward by Gallahue in (Tiara Yuniar et al., 2023) which states that motor development takes place through repeated movement experiences. The more often physical activities that involve the coordination of various movement components, the better the development of motor skills.

These tangible results also answer the problems found in the initial observations before the study. Through this routine Rangku Alu game, students not only become

more agile in maintaining their body balance, but also become more confident in their own physical abilities. These results also reinforce previous research from (Prima & Lestari, 2025) which proves that the Rangku Alu game is very effective in training children's agility and body balance.

2. Increased Social skills

This study also shows that the implementation of rhythmic activities through the Rangku Alu game is able to improve the social skills of elementary school students. This increase indicates that traditional games carried out in groups are able to create a learning environment that encourages students to interact, cooperate, and communicate actively during the learning process. Thus, the Rangku Alu game not only provides a learning experience on the physical aspect, but also a means of developing students' social skills.

The improvement of social skills occurs because the structure of the Rangku Alu game requires dependency between players. Each member of the group has a different role, both as a bamboo mover, and as a jumping player. In order for the game to run well, all members of the group must be able to communicate, equalize tempo, obey the rules, wait for turns, and help each other when mistakes occur. This condition causes social interaction to take place naturally during the game so that students learn to work together, respect friends, control emotions when experiencing failure, and show assertive behavior in expressing opinions and giving directions to other group members.

Rhythmic activities through the song Manuk Dadali also strengthen the process. The tempo of the song is a common reference that must be followed by all players so that students are required to pay attention to each other's movements so that the game takes place in sync. The similarity of rhythms creates better group coordination and improves communication during the game. Thus, songs not only function as a tempo regulator of movements, but also as a medium that strengthens cooperation and social interaction between group members.

This finding is in line with the theory put forward by Caldarella and Merrell in (Christine et al., 2021) which states that indicators of social skills include relationships with peers, self-management, academic ability, obedience, and assertive behavior. In the game Rangku Alu, students not only do physical activities, but also learn to work together, communicate, and adjust to their group members. This helps students build

better relationships with their peers because games are played together and require cohesiveness between group members.

Self-management indicators are also visible during the course of the game. Students learn to control themselves, wait for their turns, and maintain focus when following the rhythm of the game. The ability to control emotions and behaviors is important in the development of social skills of elementary school students (Nurishlah et al., 2024). In addition, students also learn to obey the rules of the game so that activities can run well. Compliance with the rules is seen when students follow the instructions of the game, maintain order, and carry out their respective roles according to mutually agreed terms.

The game of Rangku Alu also encourages the emergence of assertive behavior in students. During the game, students dare to interact, respond to friends, and show confidence when participating in the game. The interactions that occur during the game help students to be more active in communicating and participating in group activities. This ability shows the development of positive social behavior in students.

The positive impact of this group cooperation solved the social problems that had been found at the beginning of the observation. The exciting and dynamic rules of the Rangku Alu game managed to melt the atmosphere. Each student is finally willing to communicate, support each other, and obey their respective roles fairly with anyone regardless of friends. The cheerful playing atmosphere makes this social interaction run naturally without coercion. These findings also go hand in hand with previous research from (Widyananti & Winanto, 2024) and (Hutomo & Kurniawan, 2025) which states that incorporating traditional games into lessons in elementary schools is very effective in training children's communication skills, teamwork, and social adaptation because it is packaged through a carefree and inclusive learning atmosphere. This causes social relations between students to be better than before.

CONCLUSIONS

Based on the findings and interpretation of the data, several conclusions were obtained as follows:

1. The implementation of rhythmic activities through the Nusantara Rangku Alu game has been proven to significantly improve the gross motor movement ability of elementary school students. This is supported by the results of *the Paired Sample T-test* analysis of 0.000 < 0.05, which means that the *average score of the student's motor movement*

posttest is much higher than the *pretest score*. The activities of jumping, changing positions, and responding to rhythmic movement challenges between bamboo bars are effective stimulation in forming movement control and dynamic balance of the student's body.

2. The implementation of the Nusantara Rangku Alu game has a positive and significant effect on improving the social skills of grade IV students. The results of the hypothesis test showed a significance value of 0.000 < 0.05, with the percentage of social engagement increasing at each meeting. In addition, it was strengthened by the final questionnaire data which produced a high average percentage value of 91.58% with a homogeneous data distribution. Through these group games, indicators of relationships with peers, self-management, adherence to rules, as well as students' assertive behavior can develop optimally through real, enjoyable experiences.

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