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Indonesian Journal of Pedagogy and Teacher Education Vol 3 No 2 (2025) https://doi.org/10.58723/ijopate.v3i2.489
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Research Article

The Effectiveness of the Traditional Rangku Alu Game in Improving the Agility of Elementary School Students

Received : July 16, 2025	Revised : August 14, 2025	Accepted: August 18, 2025	Publish : August 27, 2025

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Abstract:

Background of Study: The low agility of students in Physical Education, Sports, and Health (PJOK) learning is often caused by conventional methods that lack variation and do not optimize traditional games. Rangku Alu, a rhythmic movement game involving agility, coordination, and quick direction changes, aligns with PJOK learning goals and helps preserve local culture.

Aims and Scope of Paper: This study aims to determine the effectiveness of the traditional Rangku Alu game in improving the agility of fifth-grade elementary school students and to propose it as an alternative, fun, interactive, and culturally relevant PJOK learning method.

Methods: A quantitative experimental approach with a one-group pretest-posttest design was applied to 11 fifth-grade students at SDN 3 Sumberdadi. Agility was measured using the Hexagon Drill Test before and after eight PJOK sessions integrating Rangku Alu. Data were analyzed using the Shapiro-Wilk normality test, Paired Sample t-Test, and N-Gain test.

Result: The average pretest time decreased from 14.30 seconds to 11.90 seconds in the posttest. The t-test yielded a significance value of 0.000 ($p < 0.05$), and the N-Gain average was 65%, indicating moderate effectiveness.

Conclusion: The Rangku Alu game significantly improves students' agility and can serve as an effective, enjoyable, and culturally based alternative in PJOK learning. It also supports cultural preservation in the school environment while promoting active participation and holistic physical development.

Keywords: Agility, Rangku Alu, Traditional Games

1. INTRODUCTION

Physical Education, Sports, and Health (PJOK) is an integral part of the national education system and plays a crucial role in developing physically, mentally, and socially healthy individuals (Siregar et al., 2022). The objectives of PJOK learning extend beyond mastering movement skills to encompass character development, physical fitness, a healthy lifestyle, and an introduction to a clean and healthy environment through systematic and planned activities (Darani et al., 2020).

Furthermore, exercise plays a crucial role in improving students' fitness and physical condition, ultimately impacting their ability to carry out daily activities without experiencing significant fatigue (Laksono & Mandalawati, 2022). Teachers play a crucial role in designing activities that lead to behavioral changes and student knowledge acquisition (Rohmah, 2020). PJOK learning is geared toward achieving the Pancasila student profile through flexible, contextual, and interest-based activities (Rahayu et al., 2022; Fitriani et al., 2023). However, the reality on the ground shows that PJOK learning in many elementary schools is still dominated by conventional methods that lack active student engagement. One of the essential competencies in physical activity and sports is agility. Agility is defined as the body's ability to move or change direction quickly without losing balance (Ardianda & Arwandi, 2020; Adi et al., 2020) . This skill is essential in various sports and physical activities because it directly relates to quick responses to game situations and movement efficiency (Yohana Bire, 2023). Low levels of student agility can impact suboptimal physical performance and minimal participation in physical education (PJOK) learning. Therefore, learning approaches that effectively develop student agility need to be implemented immediately.

One relevant alternative is the use of traditional games as learning media. Traditional games have educational and recreational value, and are rich in cultural elements and local wisdom (Wijayanti, 2020; Atty, 2023) ne form of traditional game considered to have great potential in developing agility is rangku alu. Rangku alu requires coordination, speed, balance, and precision of movement (Nay et al., 2024), making it highly relevant to learning indicators in PJOK.

However, with the passage of time and rapid technological advancements, traditional games have begun to be marginalized and replaced by digital games that tend to be passive. As a result, students' physical activity has decreased significantly, impacting their fitness and basic motor skills. Based on observations and interviews conducted at SDN 3 Sumberdadi, it was discovered that physical education (PJOK) learning remains monotonous and does not utilize a variety of engaging methods like traditional games. Teachers tend to use lectures and basic movement demonstrations without innovation, due to limited school facilities and infrastructure. Consequently, active student participation is low, and agility development is not optimally achieved.

To address this issue, an innovative and affordable approach is needed, one of which is through the integration of rangku alu into the PJOK learning process. In addition to being a physical learning tool, this game can also be a means of instilling character values and preserving local culture, which is beginning to be eroded by modern developments (Dzakiyyah, 2024).

Previous research by Bawazir et al., (2024) showed that gobak sodor can improve elementary school students' agility through a traditional game-based learning approach. Another study by Rizqa et al. (2023) also demonstrated the positive influence of traditional games on improving student agility using the shuttle run test as an instrument. Although both studies are relevant, there are significant differences with this study, both in terms of the subjects, objects, and interventions used. This study is novel in terms of utilizing the rangku alu game, which has not been widely used systematically in elementary school environments as an intervention to improve student agility. In addition, the measurement instrument used, the Hexagon Drill Test, provides more standardized and objective data compared to previous studies (Rusli et al., 2022). Therefore, this study aims to examine the effectiveness of this game in improving student agility and provide an alternative for PJOK learning that is fun, interactive, and based on local culture.

The main research problem in this study is the low level of students' agility due to monotonous and less engaging PJOK learning methods that do not utilize traditional games effectively. Therefore, this study aims to examine the effectiveness of the traditional Rangku Alu game in improving the agility of fifth-grade elementary school students and to explore its potential as a culturally-based and enjoyable learning alternative in PJOK.

2. MATERIAL AND METHOD

This research method uses a quantitative approach with an experimental research type and a One-Group Pre-test-Post-test Design, where there is an initial measurement before treatment and a final measurement after treatment to determine the changes that occur due to the intervention. The research was conducted at SDN 3 Sumberdadi, Trenggalek District, with 12 fifth-grade students consisting of 8 male students and 4 female students as research subjects. The sampling technique used the total sampling method, namely the entire population was used as a sample because the number was relatively small and in accordance with the research criteria, namely students in fifth grade with limited understanding of traditional games.

This research was conducted during April 2025, located at SDN 3 Sumberdadi, and lasted for two weeks, including pretest activities, treatment in the form of learning using the traditional game rangku alu, and posttest. The research procedure included the preparation stage, implementation of the pretest using the Hexagonal Drill Test, providing treatment during several meetings, and implementation of the posttest with the same test. Data were collected through an agility test using the Hexagonal Drill Test instrument which has a reliability of 0.758 and a validity of 0.722 (Zefiter & Irawan, 2020), making it suitable for use in measuring changes in students' agility levels. Data analysis was carried out using inferential statistics with the help of SPSS software version 27.

The prerequisite test used was the normality test to see the distribution of the data. To test the hypothesis, a Paired T-Test was used to determine significant differences between pretest and posttest scores in the same group, with the decision-making criteria if the significance value <0.05 then Ha is accepted and H0 is rejected, which means there is a significant effect of the treatment. In addition, the N-Gain test was also used to determine the effectiveness of the treatment in improving the results of the agility test, by comparing the increase in pretest and posttest scores to the maximum possible score, and analyzed with a gain normality test (Oktavia et al., 2019). This research has a limited scope on fifth grade students of SDN 3 Sumberdadi and focuses on one type of traditional game, so the results cannot necessarily be generalized to other school levels or areas that have different characteristics.

3. RESULT AND DISCUSSION

3.1 Result

The following is an analysis of the results of the agility pretest and posttest using the hexagon drill test instrument.

Table 1. Distribution of Student Pretest and Posttest Data

Category	Minimum Value	Maximum Value	Average	Std. Deviation
Pretest	12.36	16.27	14.30	1.35247
Posttest	10.32	15.50	11.90	1.59037

The pretest assessment for students was as follows: the maximum score obtained from the sample above was 16.27, the minimum score was 12.36, and the average score (mean) was 14.30, with a standard deviation (std. deviation) of 1.35247. The pretest assessment for students was as follows: the maximum score obtained from the sample above was 15.50, the minimum score was 10.32, and the average score (mean) was 11.90, with a standard deviation (std. deviation) of 1.59037. It was found that students were able to complete the Hexagon Drill Test more quickly after eight treatments using the traditional Rangku Alu game, indicating an increase in overall agility.

Hypothesis testing was intended to determine the effect of using the traditional Rangku Alu game on fifth-grade elementary school students. This was determined by conducting a Paired Sample t-Test.

Table 2. Paired Sample t-Test Results for Student Agility

	t	*Sig.*
Pretest - posttest	6.955	.000

The results showed that the traditional game of Rangku Alu significantly improved the agility of fifth-grade students at SDN 3 Sumberdadi, with a significance value of 0.000.

The N-Gain test was used to measure the extent of performance improvement after treatment.

Table 3. Average N-Gain Test Results

Rata-rata N-Gain	Rata-rata N-Gain Persen
0,65	65%

Based on the research results, an average N-Gain of 0.65 or 65% was obtained, which is considered moderate. This indicates that the use of the traditional game, Rangku Alu, is effective in improving the agility of fifth-grade students at SDN 3 Sumberdadi. This improvement is evident in the decrease in time on the Hexagon Drill Test after eight sessions of treatment.

Based on statistical tests conducted, the researcher demonstrated the effectiveness of the traditional game, Rangku Alu, in improving the agility of elementary school students. This effect can be seen from the results of the Paired Sample t-Test using IBM SPSS Statistics 21. The Paired Sample t-Test analysis results are significant if the sig value is <0.05, while if the sig value is >0.05, there is no change after the treatment. Therefore, the traditional game, Rangku Alu, is quite effective in improving the agility of elementary school students.

3.2 Discussion

The findings indicate that the Rangku Alu game significantly enhanced students' agility, which supports the theoretical perspective that rhythmic, rapid, and coordinated movements can improve agility (Haryono et al., 2021; Kusuma & Irawan, 2022). The game requires players to perform quick jumps, change direction instantly, and coordinate steps to avoid moving bamboo poles, which stimulates agility in a natural and engaging manner. The reduced completion times in the posttest demonstrate that repetitive practice through enjoyable activities can improve motor performance in a short period.

These results are in line with previous studies emphasizing the benefits of traditional games in physical education. Wijayanti (2020) highlighted that traditional games carry both educational and recreational value, while Nay et al. (2024) found that Rangku Alu specifically develops dexterity, speed, and coordination. The present study reinforces these findings by showing measurable improvements in agility through structured PJOK sessions that incorporate Rangku Alu.

Further comparison with other traditional games shows similar trends. Bawazir et al., (2024) reported agility gains from Gobak Sodor, and Rizqa et al. (2023) observed comparable benefits from Lari Balok. While the mechanics differ, the underlying principles requiring rapid movement and coordination are shared. The novelty here lies in the focused use of Rangku Alu, which is less explored in elementary school settings, especially in a structured, quantitative intervention.

Another important aspect is the cultural dimension of using Rangku Alu. Integrating such games into the curriculum not only meets physical development objectives but also strengthens cultural identity. In an era where digital entertainment reduces physical activity, traditional games can counterbalance sedentary habits and reintroduce meaningful cultural practices into school life.

While the improvements are clear, the study's scope and methodology present certain constraints. The absence of a control group makes it difficult to isolate the effects of the game alone, and the short duration of the intervention limits conclusions about long-term benefits. Nevertheless, the consistent improvement across all participants indicates a strong potential for replication in broader contexts.

Thus, this interpretation indicates that the research results not only validate the theories that have served as the basis for the research but also provide significance for the development of knowledge and practice in Physical Education (PJOK) learning. The traditional game, Rangku Alu, can be used by teachers as an alternative, relevant, enjoyable, and beneficial learning tool in everyday activities to significantly improve students' agility. Thus, it can be said that the traditional game of Rangku Alu is an appropriate and effective type of game to be implemented to improve the agility of elementary school students. Based on this, the research conducted by the researcher entitled "The Effectiveness of the Traditional Game of Rangku Alu on Improving the Agility of Elementary School Students" supported by relevant studies found that the traditional game of Rangku Alu can improve the agility of elementary school students.

3.2.1 Implications

For teachers, the study suggests that Rangku Alu can be integrated as an alternative to conventional agility drills in PJOK classes, providing both physical and cultural benefits. For curriculum developers, these findings indicate that traditional games can be systematically embedded into learning modules to support both skill development and heritage preservation. For students, engaging in such games may enhance motivation, increase active participation, and build teamwork skills alongside agility improvements.

3.2.2 Research Contribution

This study contributes to the growing body of literature on culturally relevant physical education strategies. It offers empirical evidence of Rangku Alu's effectiveness in enhancing agility among elementary school students, fills a gap in research where this game has been underexplored, and demonstrates the application of a standardized agility measurement tool in assessing traditional game interventions.

3.2.3 Limitations

The research was conducted on a small sample of 11 students from a single school, limiting the generalizability of the results. The intervention lasted only two weeks, which may not capture sustained or long-term improvements. Additionally, without a control group, the study cannot fully rule out other contributing factors to the observed gains.

3.2.4 Suggestions

Future research should involve larger, more diverse samples and extend the intervention period to examine long-term effects. Including a control group would strengthen causal inferences. Expanding the study to test other traditional games could provide a broader understanding of their benefits. Incorporating qualitative feedback from students could also offer insights into motivation and engagement levels, complementing the quantitative results.

4. CONCLUSION

Based on the results of the research that has been conducted, it can be concluded that the use of the traditional game rangku alu has a significant influence on improving the agility of fifth-grade students at SD Negeri 3 Sumberdadi. The application of this game in PJOK learning has proven quite effective in improving students' physical aspects, especially agility, as shown through the results of statistical tests and increased agility test scores. The traditional game rangku alu can be used as an alternative PJOK learning model that is fun, meaningful, and able to foster active student participation. In addition, this game also plays an

important role in efforts to preserve local culture in the elementary school environment, so that it can strengthen cultural identity while supporting the achievement of national education goals holistically.

5. ACKNOWLEDGEMENT

The authors would like to express their gratitude to the principal, teachers, and fifth-grade students of SDN 3 Sumberdadi for their active participation and support during the research process. Appreciation is also extended to the school administration for granting permission to conduct the study and to the colleagues who provided valuable feedback during the preparation of the manuscript.

6. AUTHOR CONTRIBUTION STATEMENT

All authors contributed equally to the conception and design of the study, data collection, data analysis, and interpretation of the findings. They collaboratively developed the manuscript, critically reviewed its content, and approved the final version for publication.

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