

Effectiveness of the paper relay game method in improving cooperation and discipline in the candle pose material

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ABSTRACT

Physical education plays a strategic role in shaping student character through planned physical activity, yet floor gymnastics lessons at SMA N 1 Pegandon still show low engagement, with many students appearing passive, bored, and reluctant to follow the rules during the candle pose material. This study set out to test whether a paper relay game could raise cooperation and discipline in that setting. The research used a quantitative pre-experimental approach with a one-group pretest-posttest design involving 35 students of class X-5, chosen through purposive sampling. Cooperation and discipline were measured with observation sheets before and after the treatment, then analysed descriptively and with the Wilcoxon Signed-Rank Test in IBM SPSS Statistics 22. The average cooperation score rose from 2.03 to 2.57 and discipline climbed from 2.03 to 2.71, while the standard deviation fell for both, showing more consistent results after the treatment. The Wilcoxon test produced a significance value of 0.001 for cooperation and less than 0.001 for discipline, both below 0.05. These results show that the paper relay game method effectively improves cooperation and discipline, so it can serve as an engaging alternative strategy for physical education teachers.

Keywords: Paper relay game; Cooperation; Discipline; Candle pose; Physical education



Received: 11 July 2026 ; Accepted: 07 August 2026; Published: 08 August 2026

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How to Cite: Farda, N., Fahmi, D. A., & Royana, I. F. (2026). Effectiveness of the paper relay game method in improving cooperation and discipline in the candle pose material. *Citius: Jurnal Pendidikan Jasmani, Olahraga, dan Kesehatan*, 6(2), 72-80. <https://doi.org/10.32665/citius.v6i2.7180>

Authors' Contribution: a - Study Design; b - Data Collection; c - Statistical Analysis; d - Manuscript Preparation; e - Funds Collection

INTRODUCTION

Physical Education, Sports, and Health (Pendidikan Jasmani, Olahraga, dan Kesehatan, PJOK) holds a strategic position in shaping character while improving learners' quality of life through planned physical activity. At SMA Negeri 1 Pegandon this subject is a space for developing physical fitness, motor skills, and character. Hadjarati and Haryanto (2020) note that physical education is closely tied to the formation of behaviour, particularly in the affective and psychomotor domains that ultimately become indicators of individual progress, both the physically visible and the psychological. In line with national education goals, structured physical activity contributes significantly to holistic

student character by fostering values such as responsibility, cooperation, independence, discipline, tolerance, honesty, and self-confidence (Carsiwan et al., 2025).

One of the PJOK topics taught at the school is floor gymnastics. Floor gymnastics, also known as artistic gymnastics, is a branch of gymnastics whose movements are performed in various forms using the floor or a mat as the main medium (Setiawati et al., 2020). The material demands muscular strength, balance, flexibility, and body coordination. A basic movement taught is the candle pose, or shoulder stand, which requires good body control and balance (Dortje et al., 2022). Floor gymnastics lessons are usually delivered outdoors through direct practice, yet their implementation is often hampered, especially in terms of active student involvement and the achievement of learning objectives (Chandra et al., 2021).

Observations made by student teachers during field practice found that most students were passive during floor gymnastics lessons, especially when practising the candle pose. They tended to lose focus, grew bored, and showed low enthusiasm for learning. Some ignored the teacher's instructions, chose to sit at the edge of the field, or joked with friends while the activity was underway. This disengagement is compounded by the demanding nature of floor gymnastics techniques, which leaves many female students reluctant or even afraid to attempt the movements (Maulana et al., 2020). Low motivation and participation of this kind lead to less than optimal learning outcomes and unmet basic competencies. Some students also disregard the rules set by the teacher, for instance by not maintaining safety during paired practice (Bahri et al., 2020).

These conditions call for more innovative and engaging learning strategies. One promising approach is the game method, which has been shown to raise students' enthusiasm and participation in physical education (Usman R. & Juhanis, 2024). Game activities create enjoyable situations, build social interaction, and help develop movement skills, so students become more active and focused (Setyawan et al., 2024). Traditional and group games in particular contain elements of physical movement and build cooperation among students (Rossi et al., 2023), and they have a significant effect on the gross motor performance of school children (Ariyanto et al., 2020; Maulana et al., 2025). The paper relay game is one such group activity, integrating floor gymnastics movement with teamwork. Students are divided into groups and cooperate to move paper while practising balance and body control as in the candle pose. This encourages mutual support, adherence to the rules, and the joint completion of challenges, so cooperation and discipline grow together. The approach is consistent with the finding of Hidayat et al. (2025) that using games in PJOK increased student engagement in learning activities to as high as 88%.

Building on these conditions, this study examines the effectiveness of the paper relay game method in improving students' cooperation and discipline in floor gymnastics at SMA Negeri 1 Pegandon. It evaluates how far the game method positively affects the achievement of PJOK learning objectives, both in motor skills and in character formation. The results are expected to reveal a more optimal way of developing students' basic movement skills while improving their fitness and health as a whole (Rahmadani et al., 2025), and to serve as a relevant alternative strategy for PJOK teachers in creating enjoyable, active, and educational learning (Barba-Martin et al., 2020).

METHODS

This study used an experimental method with a quantitative approach. The type of experiment was a pre-experimental design in the form of a one-group pretest-posttest design (Cohen et al., 2011). The design was chosen to determine the effectiveness of the paper relay game method in improving students' cooperation and discipline in floor gymnastics on the candle pose material. Before the

treatment, students first took a pretest to measure their level of cooperation and discipline. After the paper relay game was applied, they took a posttest to observe the change that occurred.

The subjects were students of class X-5 of SMA Negeri 1 Pegandon who took part in PJOK on the candle pose material. Subjects were determined through purposive sampling, that is by selecting the class whose characteristics matched the research problem, namely the low cooperation and discipline of students during floor gymnastics. The independent variable was the paper relay game method, while the dependent variables were students' cooperation and discipline. Cooperation is understood as the ability to work with others toward shared goals, reflected in how students help, support, communicate, and share tasks within a group (Ghaith, 2002), an interaction that cooperative and dyadic learning settings are known to foster (Darnis & Lafont, 2015). Discipline, in turn, is understood as students' adherence to the agreed rules and procedures of the activity, shown in how consistently they obey the rules of the game, stay orderly, follow instructions on time, and listen to the teacher.

The research procedure was divided into three stages. The preparation stage covered the arrangement of instruments in the form of cooperation and discipline observation sheets, the preparation of a lesson plan using the paper relay game method, and coordination with the PJOK teacher and the school. The implementation stage included administering the pretest, delivering the candle pose material through the paper relay game, and observing students' cooperation and discipline throughout the process. The evaluation stage was carried out through a posttest to measure the improvement, followed by comparing the pretest and posttest results to see the effectiveness of the applied method.

Data were collected through observation and documentation. Observation used sheets arranged from the indicators of cooperation and discipline, and it was conducted at both the pretest and the posttest by observers who understood the instrument so that the data obtained were objective and accurate. Documentation in the form of photographs, videos, and activity notes served as supporting data and as evidence of the research in the field. The cooperation instrument covered the indicators of helping one another, supporting teammates, sharing tasks, and communicating well, while the discipline instrument covered obeying the rules of the game, staying orderly during the activity, being on time in following instructions, and listening to the teacher. Each indicator was scored 1 for a yes and 0 for a no, with a maximum score of 4.

Data analysis used descriptive and inferential statistics with the help of IBM SPSS Statistics 22. Descriptive analysis presented the mean, minimum, maximum, and the percentage of improvement in the observation results before and after the treatment. The Shapiro-Wilk normality test was used as a prerequisite to check the distribution of the pretest and posttest data. If the data were normally distributed, hypothesis testing used the Paired Sample t-Test, and if not, the Wilcoxon Signed-Rank Test was used. Decisions were based on the significance value, where a value below 0.05 indicated a significant effect and a value above 0.05 indicated none.

RESULTS

Table 1. Descriptive Statistics of Cooperation and Discipline

	N	Minimum	Maximum	Mean	Std. Deviation
Pretest_Cooperation	35	1	3	2.03	.707
Posttest_Cooperation	35	2	3	2.57	.502
Pretest_Discipline	35	1	3	2.03	.568
Posttest_Discipline	35	2	3	2.71	.458
Valid N (listwise)	35				

Based on Table 1, the mean cooperation score rose from 2.03 at the pretest to 2.57 at the posttest. A similar pattern appeared in discipline, which increased from 2.03 to 2.71 after the paper relay game was applied. The standard deviation of cooperation fell from 0.707 to 0.502, while that of discipline fell from 0.568 to 0.458. This decrease shows that students' learning outcomes became more homogeneous than before the treatment, meaning that after the game more students reached a comparably high level rather than a few improving while the rest lagged behind. Descriptively, then, the paper relay game was able to improve students' cooperation and discipline. Before the hypothesis test, a normality test was run to examine the distribution of the data. The result is presented in Table 2.

Table 2. Shapiro-Wilk Normality Test

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest_Cooperation	.259	35	<.001	.808	35	<.001
Posttest_Cooperation	.375	35	<.001	.630	35	<.001
Pretest_Discipline	.349	35	<.001	.739	35	<.001
Posttest_Discipline	.448	35	<.001	.567	35	<.001

a. Lilliefors Significance Correction

The Shapiro-Wilk normality test produced a significance value of less than 0.001 for pretest cooperation, posttest cooperation, pretest discipline, and posttest discipline. All values were below 0.05, so the research data were not normally distributed. Hypothesis testing therefore continued with the nonparametric Wilcoxon Signed-Rank Test.

Table 3. Wilcoxon Signed-Rank Test (Ranks)

		N	Mean Rank	Sum of Ranks
Posttest_Cooperation - Pretest_Cooperation	Negative Ranks	3a	8.00	24.00
	Positive Ranks	17b	10.94	186.00
	Ties	15c		
	Total	35		
Posttest_Discipline - Pretest_Discipline	Negative Ranks	1d	9.50	9.50
	Positive Ranks	21e	11.60	243.50
	Ties	13f		
	Total	35		

a. Posttest Cooperation < Pretest Cooperation; b. Posttest Cooperation > Pretest Cooperation; c. Posttest Cooperation = Pretest Cooperation; d. Posttest Discipline < Pretest Discipline; e. Posttest Discipline > Pretest Discipline; f. Posttest Discipline = Pretest Discipline

For the cooperation variable, 17 students improved (positive ranks), 3 students declined (negative ranks), and 15 students stayed the same (ties). For discipline, 21 students improved, only 1 declined, and 13 stayed the same. The figures show that most students improved in both cooperation and discipline after learning with the paper relay game.

Table 4. Wilcoxon Signed-Rank Test (Test Statistics)

	Posttest_Cooperation Pretest_Cooperation	- Posttest_Discipline Pretest_Discipline
Z	-3.189b	-4.070b
Asymp. Sig. (2-tailed)	.001	<.001

a. Wilcoxon Signed Ranks Test; b. Based on negative ranks.

The Wilcoxon Signed-Rank Test produced a two-tailed asymptotic significance of 0.001 for cooperation and less than 0.001 for discipline. Both values were smaller than 0.05, so there was a significant improvement in students' cooperation and discipline after the paper relay game was applied. The method was therefore shown to be effective in improving students' cooperation and discipline.

DISCUSSION

The improvement occurred because the paper relay game requires students to work in groups to complete each challenge. The activity trains them to help one another, share tasks, communicate, and take responsibility for their group, which mirrors the cooperative learning mechanisms reported in physical education (Fernandez-Rio et al., 2017). Students are also required to follow the rules of the game, so their discipline develops throughout the lesson.

The dominance of positive ranks over negative ranks indicates that the paper relay game positively affects students' character development. Game activity pushes students to interact, cooperate, obey the rules, and finish tasks as a group, so learning becomes more active and meaningful. This aligns with Triansyah et al. (2020), who show that group-based learning strengthens care and cooperation among students, and with Usman R. and Juhanis (2024), who highlight the role of game-based learning in increasing student participation in PJOK.

Learning packaged through games creates an enjoyable atmosphere, raises active participation, strengthens communication between students, and nurtures discipline in following the rules. Cooperative learning has consistently been linked with more adaptive motivation and self-determined engagement in physical education (Rivera-Perez et al., 2021), and with the satisfaction of novelty that helps sustain positive learning outcomes (Gonzalez-Cutre & Sicilia, 2019). Group work also builds the emotional and social skills that support a positive classroom climate (Casey & Quennerstedt, 2020), and when it is carefully structured it can challenge rigid relations and promote inclusion (Sanchez-Hernandez et al., 2018). From a motivational standpoint, the enjoyment generated by games supports the basic psychological needs described in self-determination theory (Deci & Ryan, 2000), while playful and traditional formats have repeatedly improved both motor competence and social problem-solving in school children (Yilmaz & Griffiths, 2023), (Afifah Maulidiyyah & Purwoko, 2023), (Gipit et al., 2017). Movement-based games likewise reinforce the fundamental motor patterns that underpin more complex skills (Goodway et al., 2019). For these reasons, the paper relay game deserves a place as an innovative PJOK strategy that supports learning objectives while shaping the character of learners (Garcia, 2021).

CONCLUSION

Based on the results, the paper relay game method is effective in improving students' cooperation and discipline on the candle pose material at SMA Negeri 1 Pegandon. This is supported by the descriptive statistics, which show the mean cooperation rising from 2.03 to 2.57 and discipline from 2.03 to 2.71, together with a fall in the standard deviation that indicates more homogeneous learning outcomes after the treatment. The normality test showed that the data were not normally distributed, with a significance value below 0.05, so hypothesis testing used the Wilcoxon Signed-Rank Test. Most students improved, namely 17 students in cooperation and 21 students in discipline, with a significance value of 0.001 for cooperation and less than 0.001 for discipline. The application of the paper relay game therefore had a significant effect on the improvement of students' cooperation and discipline, so the method is worth using as an alternative PJOK strategy that creates a more active and enjoyable atmosphere while supporting character formation. These findings should nonetheless

be read with care. Because the study used a one-group pretest-posttest design without a control group and involved only a single class, the observed gains cannot be fully separated from other influences such as maturation or repeated testing, and they may not generalise to other schools or materials. Future research could apply a control-group design with larger and more varied samples, and explore whether the paper relay game also nurtures other character values or supports different floor gymnastics materials over a longer period.

ACKNOWLEDGEMENTS

The authors thank the principal, the PJOK teacher, and the students of class X-5 of SMA Negeri 1 Pegandon for supporting the implementation of this study. The authors also thank the supervisors and the Physical Education, Health and Recreation Study Program of Universitas PGRI Semarang for their guidance and constructive input throughout the research.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest that could influence the implementation or the results of this research.

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