



Integration of Traditional Kerinci Games in Elementary School Physical Education: Impacts on Cooperation and Discipline

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ABSTRACT

This preliminary study examined the impact of integrating three traditional Kerinci games, including Rakalah, Conce, and Prakeja, into elementary school physical education learning on student cooperation and self-discipline. A total of 30 students in grades IV and V participated in 16 meetings within a single-group pretest-posttest design. Cooperation and self-discipline were measured using a questionnaire that had been tested for its validity and reliability, then analyzed using a paired t-test and Cohen's d effect size. The cooperation score increased from 38.77 to 45.60, while the self-discipline score increased from 38.33 to 42.40. This study is expected to enrich the evidence for cultural pedagogy, showing that local games can serve as a vehicle for character education in physical education learning. Teachers can use traditional games as core activities and as part of P5 activities to practice role coordination, rule adherence, and value reflection. However, because the design lacked a control group and the measurements were self-report-based, the findings need to be confirmed through experimental studies using observational data.

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INTRODUCTION

Character education is the foundation of learning at the elementary school level, especially for building cooperation and self-discipline as demonstrated in daily classroom behaviour. In the context of play and physical activity, conflict, motor aggression, and non-compliance with rules can arise when the values and rules of the game are not understood, thus physical education needs to be designed as a learning space for emotional regulation, social coordination, and conflict resolution (Lavega-Burgués, Magno-Ribas, et al., 2023; Rillo-Albert et al., 2021).

Several studies have shown that traditional sports games can enrich the student socio-emotional experiences, including empathy, creativity, and decision-making, through meaningful and rule-based interactions (Alcaraz-Muñoz et al., 2020; Costes et al., 2021; Lavega-Burgués, Alcaraz-Muñoz, et al., 2023; Martínez-Santos et al., 2020; Oboeuf et al., 2020). These findings reinforce the position of games as a pedagogical medium for internalizing values, rather than simply a recreational activity.

In Physical Education, pedagogical interventions such as cooperative learning and the Teaching Personal and Social Responsibility (TPSR) model have also been reported to be associated with improved student social and responsibility outcomes (Fernández-Espínola et al., 2020; Yao et al., 2025; Stiadi et al., 2020; García-García et al., 2020; Manzano-Sánchez et al., 2020; Trajkovik et al., 2018; Aygun et al., 2024). However, many studies still focus on traditional models or games in general, while specific evidence testing certain local games and measurable character outcomes in the Indonesian elementary school context is still limited.

The Independent Curriculum, P5, and the Strengthening of Character Education Program policy emphasize contextual learning and the strengthening of mutual cooperation and discipline (Darwanto & Saryono, 2024). Similarly, strengthening the *Pancasila* Student Profile can be internalized through traditional games accompanied by reflective dialogue (Nur et al., 2022). However, physical education practices in elementary schools often focus on motor skills and administrative assessments, so the exploration of character values through local games has not been optimized (Syarifatunnisa et al., 2024).

Several studies have shown that traditional sports games can facilitate social inclusion and value learning through interaction and role-playing (Carter-Thuillier et al., 2023; Temel et al., 2024). In the context of elementary schools in Indonesia, traditional games can also be developed into appropriate and interesting physical education materials (Asriasnyah, 2018), while physical activity programs that integrate life skills have been reported to improve student teamwork and communication (Suardika et al., 2024). Kerinci Regency has traditional games like *Rakalah*, *Conce*, and *Prakeja*, which are increasingly rarely played due to the shift in child activities to gadgets and digital games. Integrating these games into physical education has the potential to provide benefits because it utilizes the unique rule structure, role rotation, and social consequences to train cooperation and discipline and also serves as a strategy for preserving local culture within the P5 project.

Theoretically, this research draws on Social Learning Theory (Bandura, 1977) and Cultural-Historical Activity Theory (Vygotsky, 1978) to explain how the values of cooperation and discipline can be learned through peer observation and mediated by cultural practices in play. Furthermore, the structure of play can be mapped through universal concepts of play and

game goals to link rules and roles with emerging character values (Ormo-Ribes et al., 2021; Parlebas, 2020; Ribas et al., 2023).

Based on the existing knowledge and the aforementioned research gaps, this study aimed to assess changes in elementary school student cooperation and self-discipline scores after integrating traditional Kerinci games into physical education learning. Given resource limitations and the lack of preliminary evidence in the Kerinci context, a single-group pretest-posttest design was used as an exploratory study to generate preliminary evidence that can be further tested through a more robust design.

METHODS

This study used a quantitative approach with a single-group pretest-posttest design. This design was positioned as a preliminary study to test the feasibility and provide initial evidence on the impact of integrating traditional Kerinci games on the student character development. Because it did not involve a control group and used a self-report questionnaire, the study results need to be interpreted cautiously, considering the potential influence of external factors and social desirability bias.

Participants

The research participants consisted of 30 fourth and fifth grade students of SD Negeri 216/III Sungai Langkap who were selected through a simple random sampling. The participants were students who completed the pretest–posttest measurements and were present during the learning intervention.

Materials and Apparatus

The research instruments consisted of two questionnaires, namely a cooperation questionnaire and a self-discipline questionnaire, each consisting of 10 statements with a Likert scale. The cooperation questionnaire adapted the Teamwork Scale for Youth (TSY) to the context of elementary school physical education. The self-discipline questionnaire referred to indicators of compliance with game and learning rules, self-control when interacting, responsibility in carrying out roles, and consistency in completing tasks and following teacher instructions.

The instrument adaptation process was carried out in three steps: (1) translation and adjustment of the wording of items to suit the level of understanding of elementary school students, (2) expert judgment by physical education experts and learning evaluation experts to ensure content validity in relation to the construct being measured, and (3) limited testing on students with similar characteristics to test readability and internal consistency. The reliability of the instrument was calculated using Cronbach's alpha coefficient, while the validity of the items was tested through item–total correlation (corrected item–total correlation). The reliability test results showed that the cooperation questionnaire consisted of 10 items with $\alpha=0.874$ and a corrected item–total correlation range of 0.484–0.725, while the self-discipline questionnaire consisted of 10 items with $\alpha=0.900$ and a corrected item–total correlation range of 0.544–0.791. An alpha value ≥ 0.70 and adequate item–total correlation indicate that the instrument has good internal consistency and is suitable for use in the main study.

Procedures

The research was conducted in three stages: (1) pretest on cooperation and self-discipline, (2) intervention integrating traditional games of *Rakalah*, *Conce*, and *Prakeja* into physical education learning for 16 meetings, and (3) post-test using the same instrument. Each intervention session included warm-ups, explanation of objectives and rules, group or role

formation, game implementation, and a closing session consisting of cool-downs and character value reflections.

Ethical Considerations

This study was conducted with permission from the school and informed consent from parents/guardians. Student participation was voluntary, and students could withdraw at any time without academic consequences. To reduce social desirability bias in the self-report questionnaire, the completion was anonymous and students were informed that there were no right or wrong answers. Data were reported in aggregate form to maintain participant confidentiality.

Data Analysis

Data analysis was conducted to assess changes in cooperation and self-discipline scores before and after the intervention. Pre-test and post-test data were first tested for normality using the Shapiro–Wilk test because the sample size was relatively small ($N = 30$). When the data were normally distributed, the difference between the mean of pre-test and post-test scores was analyzed using a paired samples t-test. The significance level was set at $\alpha = 0.05$. In addition to significance, the magnitude of the intervention impact was calculated using Cohen's d effect size to show the strength of the influence of traditional game integration on the student cooperation and self-discipline. All analyses were performed using IBM SPSS Statistics version 27.

RESULTS

The result section presents changes in the student cooperation and self-discipline scores before and after the intervention of integrating traditional games (*Rakalah*, *Conce*, and *Prakeja*) into physical education learning for 16 meetings. Pre-test and post-test data were presented descriptively, then tested for normality using Shapiro–Wilk. Since the assumption of normality was met ($p > 0.05$), mean differences were analyzed using a paired t-test. Effect sizes were reported using Cohen's d for paired designs.

Table 1. Descriptive Statistics

Group	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test Cooperation	30	27	48	38,77	5,374
Post-test Cooperation	30	36	50	45,60	3,430
Pre-test Discipline	30	30	46	38,33	4,180
Post-test Discipline	30	38	47	42,40	1,976

Table 1 shows that the mean of cooperation score increased from 38.77 to 45.60, showing a difference of 6.83 points. The standard deviation changed from 5.37 to 3.43. The mean of self-discipline score increased from 38.33 to 42.40, resulting in a difference of 4.07 points. Meanwhile, the standard deviation changed from 4.18 to 1.98.

Table 2. Normality Test

Group	N	Shapiro-Wilk	
		Statistic	Sig.
Pre-test Cooperation	30	0,964	0,379
Post-test Cooperation	30	0,936	0,072
Pre-test Discipline	30	0,966	0,426
Post-test Discipline	30	0,967	0,461

Based on Table 2, the Shapiro–Wilk significance value for all measurements is above 0.05, so the data meet the normality assumption for parametric analysis.

Table 3. Paired T-Test Results

Variable	Mean Differences	Std. Deviation	Std. Error Mean	95% Confidence Interval		t	df	Sig. (2-tailed)
				Lower	Upper			
Cooperation	6,833	2,506	0,458	7,769	5,897	14,933	29	<0,001
Discipline	4,067	3,005	0,549	5,189	2,945	7,412	29	<0,001

Table 3 shows that there was a significant difference in the mean between the pre-test and post-test scores on cooperation (mean difference = -6.833; $t(29) = 14.933$; $p < 0.001$; 95% CI: 7.769 to 5.897) and self-discipline (mean difference = 4.067; $t(29) = 7.412$; $p < 0.001$; 95% CI: 5.189 to 2.945).

Table 4. Effect Size

	Standardizer	Point Estimate
Cohen's d Cooperation	2,506	2,726
Cohen's d Discipline	3,005	1,353

Table 4 presents Cohen's d effect sizes for changes in cooperation ($d=2.726$) and self-discipline ($d=1.353$) scores. Because the differences were calculated as pre-test post-test, a negative sign in the SPSS output indicated a higher post-test score. Therefore, in reporting the effect sizes, absolute values were used ($|d|$).

DISCUSSION

The findings showed that after 16 meetings, cooperation and self-discipline scores increased significantly. Substantively, these results indicate that the *Rakalah*, *Conce*, and *Prakeja* games can be operationalized as learning experiences that require role coordination and rule compliance in real-life physical education learning situations.

The very large effect sizes for cooperation ($|d|=2.73$) and self-discipline ($|d|=1.35$) need to be read contextually. In a single-group design, effect sizes can be inflated by factors such as novelty (Hawthorne) effects, repeated measurements, and the student natural development over the intervention period. Furthermore, the use of self-report questionnaires might increase the likelihood of responses being influenced by social norms (social desirability), even though they were administered anonymously.

The mechanism most closely aligned with this research data is the rule-based and interdependent nature of games. *Rakalah*, *Conce*, and *Prakeja* require communication, task allocation, and synchronized movement to achieve a shared goal, thus improving the likelihood of cooperative behaviour and increasing its structure (Ormo-Ribes et al., 2021; Parlebas, 2020; Ribas et al., 2023). The teamwork construct measured through the scale also emphasizes coordination and shared goals (Da Silva & Peixoto, 2023). At the same time, rules, area boundaries, turns, and social consequences provide a context for practicing self-control and rule compliance that is relevant to self-discipline (Hagger et al., 2021; Lickona, 2019; Martínez-Santos et al., 2020).

Compared with the literature on physical education interventions summarized in systematic reviews and meta-analyses, the improvements found in this study appear to be greater than the patterns of improvement commonly reported for cooperative learning-

based interventions or TPSR (Fernández-Espínola et al., 2020; Aygun et al., 2024). This difference may be influenced by design strengths (such as the presence of a control group in some studies) and differences in measurement instruments (observation, teacher assessment, or self-report). Therefore, the findings of this study are best positioned as preliminary evidence that needs to be retested through quasi-experimental and experimental designs with a comparison group.

From a cultural pedagogical perspective, the integration of traditional games also provides contextual added value where students learn character through cultural practices closely tied to local identity. Several studies view traditional sports games as social laboratories for developing socio-affective relationships and managing motor aggression, thus supporting inclusion and coexistence in physical education classes (Ben Chaâbane et al., 2025; Dugas & Ben Ali, 2023; March-Llanes et al., 2023). Traditional games can also function as emotional inductions that facilitate value reflection and emotional regulation (Costes et al., 2021; Moya-Higueras et al., 2023). This aligns with the idea that traditional games can serve as social mediators for internalizing values (Vygotsky's, 1978) while simultaneously strengthening social capital and Kerinci identity (Febriza et al., 2025). Practically, teachers can include brief post-game reflections to make the emerging values (such as cooperation, discipline, and sportsmanship) explicit and transferable to other learning situations.

Research Limitations

The main limitations of this study are the pre-test post-test design without a control group, the small sample size from a single school, and the reliance on self-report questionnaires. These limitations limit causal inference and generalization. Further research is recommended using an experimental design with a control group, involving more schools, and adding observational data, teacher assessments, or interviews to minimize bias and enrich understanding of the character formation process.

CONCLUSION

This preliminary study indicates that the integration of *Rakalah*, *Conce*, and *Prakeja* games into 16 sessions of physical education learning resulted in improved cooperation and self-discipline scores for elementary school students. However, due to the single-group design without a control group and the self-report measurement, these findings cannot yet be considered strong causal evidence and need to be retested using an experimental design and observational or teacher assessment data. Practically, traditional games can be incorporated into core physical education activities and as part of P5 projects, with explanations of rules, role rotation, and brief reflections to reinforce the value of cooperation and discipline.

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AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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