

Effectiveness of the Traditional Bakiak Game in Enhancing Elementary Students' Social Skills in Physical Education

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Abstract

Traditional games are increasingly valued as culturally grounded media for fostering social development in elementary physical education. This study investigated the effectiveness of the traditional bakiak game in enhancing the social skills of Grade IV students at MI NW Al-Mujahidin during PJOK lessons. A qualitative descriptive method was employed using a structured observation checklist across multiple sessions involving 20 students selected through total sampling. Observed indicators included communication, peer acceptance, cooperation, conflict management, and self-regulation. The findings showed that most students exhibited observable social behaviors across dimensions, with communication and peer interaction appearing more consistently than conflict management. Scores were predominantly situated within the moderate range, indicating that cooperative play involving synchronized movement and shared goals encourages interpersonal engagement but may be insufficient to develop conflict-resolution skills without targeted facilitation. This study highlights the potential of traditional games like bakiak not only to support social competence but also to contribute to cultural preservation, offering evidence for their structured integration into PJOK learning.

Keywords: Traditional games; Bakiak; Social skills; Physical education (PJOK); Cooperative play; Elementary school students; Observational assessment.

INTRODUCTION

Social competence and the ability to build positive peer relationships are increasingly recognized as essential developmental outcomes in primary education, especially given the centrality of communication, cooperation, and emotional regulation to classroom participation and school adjustment. In this context, play is not merely recreational but a socially situated learning medium through which children rehearse interpersonal roles, negotiate rules, and practice empathy. Traditional games have been repeatedly positioned as culturally meaningful activities that naturally embed cooperation, communication, turn-taking, and prosocial conduct. Evidence indicates that traditional games facilitate elementary-school children's social skills through repeated practice of teamwork, communication, taking turns, and empathy (Hartanto et al., 2021), (Rosmaria & Fadhilah, 2024), (Tawakal et al., 2024) further emphasize that games containing explicit social elements can produce stronger social-skill outcomes than

games lacking such elements, and that culturally situated variants such as Dayak traditions may elicit especially adaptive social responses (Hartanto et al., 2021).

Parallel to this, physical education learning (PJOK) has expanded its educational rationale beyond physical literacy, increasingly emphasizing holistic learning outcomes that include social-emotional development and school engagement. A growing body of research suggests that game-based PJOK can improve social skills, emotional regulation, and learning motivation among elementary students, particularly when cooperative structures and physically active tasks are intentionally designed (Jiménez-Parra et al., 2022; , (Guo et al., 2022), (Muhyi et al., 2021). Programmatic examples illustrate how social values can be embedded explicitly within structured physical activities, including initiatives such as ACTIVE VALUES and PJOK-AKTIF, which foreground enjoyable learning, varied activities, and value internalization through physical play (Muhyi et al., 2021). Moreover, an empowering motivational climate in physical education has been linked to improved student social adaptation (Guo et al., 2022), and the broader view of PJOK as a contributor to holistic learning that includes social-emotional dimensions has been articulated specifically for elementary contexts (Jess et al., 2024). Consistent with this perspective, observational approaches to assessing play have demonstrated positive associations between play participation and socio-emotional competence, supported by educator views that social-emotional learning is integrated into everyday practice (Bernhardt et al., 2023; Blewitt et al., 2021).

Despite the promise of these approaches, a persistent educational challenge remains: many school settings still make limited use of traditional games within PJOK, reducing opportunities for children to develop social competencies through culturally grounded cooperative play. This challenge is intensified by digitalization trends that alter children's daily routines and peer interaction patterns. In Indonesia, studies report that children are frequently exposed to digital devices with substantial duration and frequency, which shapes how they interact socially (Sovia & Silvio (2024)). Reduced face-to-face play and diminished engagement in cooperative outdoor games may constrain practice opportunities for empathy, cooperation, and shared problem-solving capacities that are repeatedly exercised in traditional play. This concern aligns with broader literature describing declining interest in traditional games and its implications for social interaction in school settings (Gutierrez et al., 2022; Ningsyih et al., 2022; Johannes et al., 2024). As a result, schools face a dual problem: safeguarding children's social development while also preserving culturally valuable play forms that may serve as effective pedagogical tools.

A general solution proposed across educational and developmental research is the intentional reintegration of cooperative, culturally meaningful games into PJOK and character education, supported by teacher facilitation and systematic evaluation. Studies suggest that traditional games continue to contribute to social-emotional development in Indonesia, particularly when integrated into learning activities that promote peer interaction and socio-emotional competence (Astini et al., 2021; Muthmainah, 2022). Accordingly, revitalization efforts have been recommended through PJOK curricula and character education that incorporate traditional games, supported by communities and teacher training (Iswinarti et al., 2020). At the same time, the aim is not to reject digital life but to ensure balance: selective and well-guided digital platform use, combined with strong digital literacy, may help maintain creativity without displacing meaningful social interaction (Budiarti & Kurniati, 2024). However, while these proposals are compelling, schools still need context-specific evidence to guide implementation choices, including which games, what facilitation structures, and what outcomes can realistically be achieved in everyday school conditions.

More specifically, studies identify cooperation as the core mechanism through which traditional games enhance social development. By emphasizing structured interaction, clear roles, and shared goals, cooperative games provide authentic opportunities for building communication and relational skills (Tawakal et al., 2024; Harahap, 2023). In Indonesia, implementation challenges remain such as limited facilities and varying teacher understanding but the flexibility of traditional games allows for localized adaptation (Riadi & Lestari, 2021; Anggraeni et al., 2023).

Within this conceptual landscape, the traditional game bakiak offers a compelling case due to its physical requirement for synchrony and cooperation. Players must coordinate timing and movement, which inherently fosters verbal and nonverbal communication, shared decision-making, and group cohesion (Melar et al., 2025; Syamsuddin et al., 2024). Moreover, the simplicity and fairness of rules support predictable interaction, while teacher facilitation enhances the socio-emotional impact (Musafir et al., 2021; Adela et al., 2023).

Nevertheless, the literature also points to clear limitations that constrain current guidance for schools. Many studies remain cross-sectional or descriptive, and scholars call for experimental, longitudinal, and randomized designs to strengthen causal inference regarding play-based PJOK interventions and social outcomes (Jiménez-Parra et al., 2022; Saez et al., 2025). Practical implementation constraints also persist, including the need for teacher training and adequate facilities to optimize game-based PJOK learning (education & school, 2024), echoing earlier concerns regarding barriers in the digital era (Riadi & Lestari, 2021). In

addition, while social skills are often discussed broadly, robust evaluation requires attention to multidimensional constructs and clear operationalization such as communication, peer acceptance, cooperation/group relations, conflict resolution, prosocial empathy, and self-regulation each of which has established observational or teacher/peer assessment traditions (Eriksson et al. (2021); Chen, 2024; Stanton-Chapman & Schmidt, 2021; Neal et al., 2025; Rajić et al., 2020; Blewitt et al., 2021). This creates a practical research gap, so schools need context-specific evidence on how a particular cooperative traditional game functions in everyday PJOK, assessed with multidimensional indicators that reflect real interaction patterns among students.

Responding to this gap, the present study investigates the effectiveness of the traditional bakiak game for developing social skills among fourth-grade students at MI NW Al-Mujahidin in 2024. The study's objective is to evaluate social skills through key dimensions frequently emphasized in the literature communication, peer acceptance, group relations/cooperation, conflict management, and self-related behavioral regulation using observation-based indicators consistent with established definitions (Eriksson et al. (2021); Chen, 2024; Stanton-Chapman & Schmidt, 2021; Neal et al., 2025; Blewitt et al., 2021). The novelty of this study lies in combining a culturally embedded game with a structured observational framework within an Indonesian elementary school, offering practical insights for both pedagogical practice and curriculum development.

METHOD AND MATERIAL

Research design

This study employed a qualitative descriptive approach to document and interpret students' social behaviors as they occurred during PJOK sessions integrating the traditional bakiak game. The design allowed the researcher to record phenomena in a natural school setting without experimental manipulation. This approach was selected to capture contextual, interactional behaviors in real-time, which are essential for assessing social skills in elementary learners. Data were analyzed through descriptive statistics that summarize frequency, percentage, and score distributions. In this study, the traditional bakiak game functioned as the independent variable, while students' social skills captured through multiple dimensions served as the dependent variable. Focusing on a single school and class enabled in-depth analysis of recurring behaviors across multiple sessions.

Setting, participants, and sampling

The research site was MI NW Al-Mujahidin. Participants were all Grade IV students in the school during the 2024 academic year, totaling 20 students. Because the population size was small and fully accessible, the study used a total sampling technique in which the entire population served as the research sample. Sessions were held three times per week over two weeks (Wednesday, Friday, and Saturday, 09:00–10:30 WITA) in line with the school's PJOK schedule, corresponding to the school's PJOK time allocation. In reporting and analysis, students were treated as a single cohort and summarized at the group level; individuals were not identified by name, and observation records were compiled using student codes to support confidentiality.

Intervention context: the bakiak game in PJOK learning

The instructional context was PJOK learning on traditional games, during which students played bakiak. In the referenced source, bakiak is described as a traditional game tool made from strong but lightweight wood shaped like a long sandal board with multiple straps; the number of straps corresponds to the number of players (commonly three or four students on one board). The game is categorized as play and agility competition because it relies on coordinated footwork and most importantly team cohesion, requiring players to synchronize steps to move effectively as a unit.

Operationally, the game was implemented in teams where each group used a bakiak board suitable for three players. Students placed their feet under the straps and agreed on a shared stepping pattern (e.g., stepping with the left foot first or the right foot first) to maintain rhythm and prevent falling. After a whistle signaled the start, each group walked forward together on the board, and the team that reached the finish line fastest was considered the winner. The activity inherently required communication, turn-taking, and teamwork, making it suitable for observational assessment of social interaction.

Social skills measurement framework

To align measurement with established literature on children's social competence in cooperative play and PE contexts, the study adopted a multidimensional view of social skills. The central dimensions referenced in the provided literature statement include communication, peer acceptance, group relations/cooperation, conflict resolution, prosocial behavior and empathy, self-regulation, social initiation/engagement, and social problem solving. Each dimension has an operational definition that supports observation-based assessment in real-time interaction settings.

Communication is operationalized as initiative in communicating, listening ability, turn-taking in speaking, relevant responding, and clear exchange of verbal and nonverbal

information (Eriksson et al., 2021). Peer acceptance is defined as the extent to which a child is liked or approved by peers and can be accessed via peer nominations or acceptance scores in the classroom network (Chen, 2024). Group relations/cooperation refers to the ability to collaborate, share tasks and roles, and coordinate actions in group activities (Stanton-Chapman & Schmidt, 2021). Conflict resolution involves problem identification, negotiation, and selection of solutions during disagreements (Neal et al., 2025). Prosocial behavior and empathy relate to helping, sharing, and empathic responses, typically measured through observed frequency and teacher/peer ratings (Rajić et al., 2020). Self-regulation is defined as emotional and behavioral control observed in rule-following, frustration tolerance, and task focus (Blewitt et al., 2021). Social initiation/engagement focuses on the frequency and quality of initiating interactions (Chen, 2024). Social problem solving refers to identifying problems, proposing alternatives, and evaluating solutions (Rajić et al., 2020). In PE-oriented observational instrument development, similar constructs are frequently captured through rubrics with limited response categories and tested for validity and reliability through observational instrument procedures (Dyson et al., 2020; DEMİRÇİ et al., 2022; Graça et al., 2024; Willox et al., 2022; Hollett et al., 2022; Barquero-Ruiz et al., 2023).

Instrumentation: observation checklist and scoring

Data were collected using an observation sheet (checklist) designed to record students' social behaviors during PJOK sessions featuring the traditional game. The document specifies that the main instrument was an observation sheet containing statements to be checked based on what was seen in the field, and the researcher served as the key instrument who determined the quality of the field data obtained. The checklist provided response columns and used a binary response system so the observer could mark whether an indicator occurred during the learning activity.

Table 1. Observation checklist of students' social skills during PJOK sessions

Variable	Dimension/Aspect	No. of Items	Instrument Form	Response & Scoring
Social Skills	Communication Skills	10	Observation checklist	Yes = 1; No = 0
Social Skills	Peer Acceptance	10	Observation checklist	Yes = 1; No = 0
Social Skills	Building Relationships with the Group	7	Observation checklist	Yes = 1; No = 0
Social Skills	Conflict Management During Play	5	Observation checklist	Yes = 1; No = 0

Variable	Dimension/Aspect	No. of Items	Instrument Form	Response & Scoring
Social Skills	Self-related Behavior	2	Observation checklist	Yes = 1; No = 0

Items were derived from prior validated instruments and adapted for classroom observation, consistent with recommendations for low-inference, behaviorally specific coding in PE research settings (Barquero-Ruiz et al., 2023). The researcher acted as a non-participant observer to minimize disruption and ensure objectivity.

Data collection procedure

The study used non-participant observation. In this approach, the researcher observed and recorded behaviors, activities, and situations without participating directly in the activity being observed, which is commonly used to understand group dynamics in naturalistic settings. Data collection began by identifying the Grade IV students and then observing PJOK sessions on traditional games. During implementation, the researcher watched the learning activities and assessed each student's social skills by marking the checklist according to field observations. The repeated schedule across two weeks (three meetings weekly) was intended to provide sufficient observation opportunities across multiple play episodes, reducing the likelihood that results reflected one-off situational behavior rather than recurring interaction patterns.

Data analysis and categorization

Data analysis used descriptive percentage analysis. The percentage formula applied in the source expresses observed frequencies relative to the number of respondents and is used to summarize distributions of observed social-skill levels across the sample. After raw checklist scores were obtained, the study categorized social skill levels using a mean and standard deviation approach. Specifically, categories were defined as "high" when the score was at or above mean plus one standard deviation, "medium" when the score fell between mean minus one standard deviation and mean plus one standard deviation, and "low" when the score was below mean minus one standard deviation. This categorization allowed the study to report effectiveness not only as a central tendency but also as a distribution across levels, which is useful for interpreting heterogeneity in students' social responses to cooperative traditional play.

RESULT

Overall social skills outcomes (total score)

Students' total social-skill scores ranged from 15 to 34, with a mean of 30 and a standard deviation of 7.

Tabel 2. Descriptive Statistics of Overall Social Skills Scores (Bakiak-Based PJOK)

	Statistic
<i>N</i>	20
<i>Mean</i>	30
<i>Median</i>	31
<i>Mode</i>	34
<i>Std. Deviation</i>	7
<i>Minimum</i>	15
<i>Maximum</i>	34

Based on norm-referenced categories, 70% of students fell in the moderate range, 25% were classified as high, and 5% as low. This distribution suggests that most participants demonstrated observable social behaviors during the bakiak-based PJOK sessions, though few reached the highest category.

Tabel 3. Norm-Referenced Distribution of Overall Social Skills Categories

No	Interval	Category	Frequency	%
1	$34 \leq X$	High	5	25%
2	$26 \leq X < 34$	Medium	14	70%
3	$X < 26$	Low	1	5%
Total			20	100%

This “moderate-dominant” profile aligns with findings that cooperative play fosters consistent though not always maximal expression of social skills such as communication and peer interaction (Johannes et al., 2024; Subrata et al., 2025). The small proportion of high scorers may reflect individual differences in engagement, while the low proportion points to variability in readiness or participation confidence among students.

Communication skills factor

Scores for communication ranged from 2 to 10, with a mean of 8.55. Based on norm-based thresholds, 95% of students were classified as moderate, and only one student fell into the low category. No students reached the high category.

Tabel 4. Descriptive Statistics for The Communication Factor

	Statistic
<i>N</i>	20
<i>Mean</i>	8.55
<i>Median</i>	9.00
<i>Mode</i>	10.00

<i>Std, Deviation</i>	1.96
<i>Minimum</i>	2.00
<i>Maximum</i>	10.00

Under the reported norm thresholds (High: $10.51 \leq X$, Moderate: $6.59 \leq X < 10.51$, Low: $X < 6.59$), the distribution showed 95% (19 students) in the moderate category, 5% (1 student) in the low category, and 0% (0 students) in the high category.

Tabel 5. Norm-Referenced Distribution for The Communication Factor

No	Interval	Category	Frequency	%
1	$10.51 \leq X$	High	0	0%
2	$6.59 \leq X < 10.51$	Medium	19	95%
3	$X < 6.59$	Low	1	5%
Total			20	100%

This indicates that communication behaviors such as polite speaking, turn-taking, and responsive interaction were commonly observed but not consistently elevated across all participants. Such outcomes reflect patterns in cooperative games where structured interaction encourages verbal engagement, but leadership or initiative may vary by student (Mulyana et al., 2023; Wilkie et al., 2023).

Peer acceptance factor

For peer acceptance, factor scores ranged from 6.00 to 10.00, with a mean of 9.50, median of 10.00, mode of 10.00, and SD of 1.00 ($N = 20$).

Tabel 6. Descriptive Statistics for Peer Acceptance

	Statistic
<i>N</i>	20.00
<i>Mean</i>	9.50
<i>Median</i>	10.00
<i>Mode</i>	10.00
<i>Std, Deviation</i>	1.00
<i>Minimum</i>	6.00
<i>Maximum</i>	10.00

Peer acceptance scores ranged from 6 to 10, with a mean of 9.5. Most students (90%) fell into the moderate category, and 10% into the low. Although no students reached the high category, the mean was close to the scale's maximum.

Tabel 7. Norm-Referenced Distribution for Peer Acceptance

No	Interval	Category	Frequency	%
1	$11 \leq X$	High	0	0%

2	$7 \leq X < 11$	Medium	18	90%
3	$X < 7$	Low	2	10%
Total			20	100%

This pattern suggests widespread social inclusion and positive peer perception, likely fostered by the cooperative nature of the activity, but with minor variation in individual engagement. Findings are consistent with research showing that collaborative physical games support empathy, friendliness, and group belonging (Ryzin & Roseth, 2022; Garaigordobil et al., 2022).

Group relationship/cooperation factor (accepting relationships within the group)

For the factor reported as accepting relationships with group peers, scores ranged from 3.00 to 7.00, with a mean of 6.10, median of 7.00, mode of 7.00, and SD of 1.25 (N = 20).

Table 8. Descriptive Statistics for Group Relationship/Cooperation

Statistic	
<i>N</i>	20
<i>Mean</i>	6.10
<i>Median</i>	7.00
<i>Mode</i>	7.00
<i>Std. Deviation</i>	1.25
<i>Minimum</i>	3.00
<i>Maximum</i>	7.00

Group cooperation scores ranged from 3 to 7, with a mean of 6.1. A total of 85% of students were categorized as moderate, while 15% were classified as low. No students reached the high threshold.

Table 9. Norm-Referenced Distribution for Group Relationship/Cooperation

No	Interval	Category	Frequency	%
1	$7 \leq X$	High	0	0%
2	$5 \leq X < 7$	Medium	17	85%
3	$X < 5$	Low	3	15%
Total			20	100%

These results reflect consistent cooperative participation during group play, though some students showed limited engagement or coordination. This aligns with findings that repeated group interaction fosters mutual support but may require facilitation to fully engage all participants (Ritonga et al., 2022; Woo et al., 2024).

Conflict management during play factor

For conflict management during play, scores ranged from 1.00 to 5.00, with a mean of 4.00, median of 4.00, mode of 5.00, and SD of 1.17 (N = 20).

Table 10. Descriptive Statistics for Conflict Management During Play

Statistic	
<i>N</i>	20.
<i>Mean</i>	4.00
<i>Median</i>	4.00
<i>Mode</i>	5.00
<i>Std. Deviation</i>	1.17
<i>Minimum</i>	1.00
<i>Maximum</i>	5.00

Scores for conflict management ranged from 1 to 5, with a mean of 4. Here, 70% were in the moderate category and 30% in the low category. This was the only domain with such a large proportion of low-category scores.

Table 11. Norm-Referenced Distribution for Conflict Management During Play

No	Interval	Category	Frequency	%
1	$5.17 \leq X$	High	0	0%
2	$4.00 \leq X < 5.17$	Medium	14	70%
3	$X < 4.00$	Low	6	30%
Total			20	100%

This result highlights conflict resolution as the weakest domain, suggesting that managing disagreement and negotiating during play are more complex behaviors that may not emerge automatically. Literature indicates that while group play creates opportunities for negotiation, targeted instruction is often required to develop such skills more fully (Angu, 2020; Sharma, 2025).

Self-related behavior factor

For self-related behavior, scores ranged from 0.00 to 2.00, with a mean of 1.90, median of 2.00, mode of 2.00, and SD of 0.45 (N = 20).

Statistic	
<i>N</i>	20
<i>Mean</i>	1.90
<i>Median</i>	2.00
<i>Mode</i>	2.00
<i>Std. Deviation</i>	0.45
<i>Minimum</i>	0.00
<i>Maximum</i>	2.00

Self-related scores ranged from 0 to 2, with a mean of 1.9. Nearly all students (95%) were in the moderate category, and one student (5%) was in the low category.

No	Interval	Category	Frequency	%
1	$2.35 \leq X$	High	0	0%
2	$1.45 \leq X < 2.35$	Medium	19	95%
3	$X < 1.45$	Low	1	5%

Total	20	100%
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This suggests that rule-following and basic behavioral regulation were present but not uniformly strong. Such behaviors often reflect the impact of classroom norms and teacher modeling, which may require reinforcement to reach consistently high-performance levels (Blewitt et al., 2021).

Across all domains, results concentrated within the moderate category, with no students classified as high in any single factor. While this pattern may be partly influenced by norm-referenced cutoff points, it also reflects the real-world complexity of group behavior development. Communication and peer engagement were widely demonstrated, while conflict management showed the most variability. These findings reinforce the idea that traditional cooperative play offers a promising context for developing foundational social skills but scaffolding and facilitation are critical for higher-order interpersonal competencies to emerge (Wright et al., 2023; Woo et al., 2024).

DISCUSSION

The main finding indicates that most students demonstrated moderate levels of social-skill expression during PJOK learning that integrated the bakiak game, as reflected by the dominance of the “moderate” category (70%) in the overall distribution. This pattern is consistent with the broader literature describing that traditional/cooperative play in PE or extracurricular contexts tends to yield positive social outcomes that are commonly moderate in magnitude, while the size of effects varies with intervention design and implementation context (Fatourehchi et al., 2024; Rivera-Pérez et al., 2020; Nicolosi & Ancona, 2020). In practical terms, a “moderate” profile can be interpreted as evidence that the learning context successfully elicited many targeted social behaviors such as cooperation, communication, and peer-oriented interactions yet these behaviors were not uniformly strong or consistently displayed across all students and all moments of observation.

An additional interpretation arises from the study’s norm-referenced categorization strategy. The thesis uses mean-and-standard-deviation norms to classify scores into low, moderate, and high categories, which can concentrate observations into the moderate band when variability exists among learners. In this study, student differences are also explicitly acknowledged as an explanatory factor, including variation in physical and psychological conditions that may shape participation during motorically demanding tasks. This is particularly relevant for bakiak, a coordinated team-movement game that can amplify

differences in balance, rhythm, confidence, and willingness to engage in groups, thereby producing moderate averages even when many students show clear positive behaviors.

Communication outcomes were also concentrated in the moderate category, with 95% of students in moderate and 5% in low, and no students categorized as high using the study's thresholds. This aligns well with literature arguing that cooperative/traditional play strengthens communication through structured teamwork, turn-taking, and role coordination, which expand opportunities to speak, listen, clarify ideas, and respond appropriately (Johannes et al., 2024; Subrata et al., 2025). Importantly, the distribution suggests that communication behaviors were widely observable, but the high-category cutoff may have been difficult to surpass in a naturalistic PJOK setting where not every student consistently initiates or leads verbal interaction. This interpretation resonates with measurement literature noting that communication indicators initiative, listening, turn-taking, relevant verbal/nonverbal responses are commonly captured in social-skill instruments and can show improvement in play-based contexts, yet the level detected depends strongly on observation conditions and scoring rules (Mulyana et al., 2023; Setiawan et al., 2020; Wilkie et al., 2023; Wright et al., 2023).

Peer acceptance similarly showed a predominantly moderate pattern (90% moderate; 10% low; 0% high), with a relatively high mean within the observed range. These results are compatible with mechanisms emphasized in previous research: cooperative play tends to increase prosocial behavior and empathy, enhance feelings of belonging and social confidence, and provide structured interaction that can improve peer perceptions and acceptance (Ryzin & Roseth, 2022; Ryzin et al., 2020; Garaigordobil et al., 2022; Humphrey et al., 2022; Hellquist, 2024; Baines et al., 2025). In the present findings, the persistence of a small low subgroup indicates that not all students experience peer acceptance equally, which could reflect pre-existing social dynamics in the classroom, individual shyness, or uneven participation roles during team play. The thesis itself underscores that peer acceptance is developmentally important and shaped by factors such as prosocial behavior and confidence, which supports interpreting this factor as sensitive to individual differences that may not be fully addressed by a single instructional approach.

For group relationship/cooperation (“menerima hubungan dengan teman kelompok”), 85% of students were classified as moderate and 15% as low, with none in the high category. This again matches prior evidence that traditional team games can strengthen community spirit, cohesion, and cooperative norms through shared goals and repeated coordination (Woo et al., 2024; Musa, 2022), and is consistent with broader PE findings that cooperative structures tend to improve collaboration and group relations, though effects depend on contextual moderators

(Rivera-Pérez et al., 2020; Nicolosi & Ancona, 2020). The thesis' own theoretical framing emphasizes that effective group productivity depends on cooperation, equal participation climate, and leadership distribution conditions that can be fostered through well-facilitated group activities but may not occur automatically for all students. Therefore, a moderate outcome can be read as evidence that bakiak provides a meaningful cooperative setting, while also indicating that some students may need more explicit scaffolding to participate confidently and consistently in group processes.

Conflict management showed the largest low-category proportion: 70% moderate and 30% low, with none in high. This pattern is theoretically plausible because conflict resolution requires complex skills—negotiation, rule agreement, perspective-taking, and problem solving—that often develop with repeated practice and structured facilitation. The literature similarly highlights that group play can improve negotiation and problem solving, but stronger effects occur when games are designed with clear rules, turn-taking, role rotation, and intentional opportunities to practice resolving disagreements (Angu, 2020; Sharma, 2025; Subrata et al., 2025; Wijayanto et al., 2025). In this study, the relatively larger low subgroup suggests that, although many students can engage in cooperative planning and helping behaviors, a substantial proportion may still struggle when faced with friction during coordinated team movement. This is consistent with the thesis' view that conflict is a natural consequence of group dynamics and can surface as interpersonal or intergroup tensions if not well-managed, reinforcing the need for facilitation strategies that normalize negotiation and guide students toward constructive resolution during play.

Self-related behavior (e.g., obeying agreed rules and forgiving others) was also mainly moderate (95% moderate; 5% low; 0% high). This finding aligns with Social-Emotional Learning perspectives emphasizing that self-regulation is observable in structured activities where children must manage emotions, comply with shared norms, and adjust behavior in social situations (Blewitt et al., 2021). The moderate categorization may reflect that, while most students complied with rules during observation, the criteria for “high” might demand near-perfect consistency across sessions. The thesis also stresses the importance of teacher modeling and reinforcement, suggesting that students’ self-related behaviors are shaped by adult guidance and school norms, which may stabilize behaviors at a moderate level unless intentionally strengthened over longer durations.

The literature emphasizes that outcomes of traditional/cooperative play are moderated by implementation fidelity, teacher competence and training, dosage (duration and frequency), class size, school culture, and curriculum integration (Dyson et al., 2020; Juhász, 2021;

Johannes et al., 2024; Pla-Pla et al., 2024; Sutardi et al., 2024; Kuzmina et al., 2020; Shimabukuro et al., 2022). The “mostly moderate” pattern observed across factors is therefore compatible with a real-world PJOK setting where resources, time, and facilitation intensity are limited. As an implication, integrating bakiak and other traditional cooperative games into PJOK can be justified both as a social-development strategy and as cultural preservation through ethnopedagogical practices, potentially strengthening identity and norms of respectful interaction (Hartanto et al., 2021; Adela et al., 2023; Lestari & Bahri, 2024), while also supporting physical literacy and health participation goals (Kumar et al., 2025). However, to shift outcomes from moderate toward higher and more uniform proficiency especially for conflict management implementation would likely need stronger scaffolding, clearer structured roles, and repeated practice opportunities under consistent teacher guidance (Dyson et al., 2020; Juhász, 2021; MANDAL, 2025).

Because the present study is descriptive and relies on observational categorization, conclusions should be framed as documenting the distribution of observed behaviors rather than establishing causal effects. The literature also stresses that many studies in this area require stronger experimental or longitudinal designs to test cause-and-effect relationships. In line with recommended designs, future work could employ experimental or quasi-experimental pre–post comparisons to estimate changes attributable to traditional PJOK play (Hartanto et al., 2021), add mixed-method approaches to capture the cultural and relational processes underlying observed behaviors (Adela et al., 2023), and test cross-site generalizability across communities and cultural settings (Rakhman et al., 2024; Kumar et al., 2025). Such designs would help clarify whether the moderate pattern reflects a stable “typical” effect size in natural school settings or a modifiable outcome dependent on implementation conditions and instructional supports.

CONCLUSIONS

This study shows that integrating the traditional bakiak game into elementary PJOK learning is associated with a predominantly moderate level of social-skill expression among Grade IV students. Overall, most students demonstrated observable social behaviors related to communication, peer acceptance, group cooperation, conflict handling, and self-related behavior within the learning sessions, but these behaviors were not uniformly strong across all learners. The most consistent pattern was the concentration of scores in the moderate category, indicating that cooperative traditional play can reliably elicit meaningful social interaction in class-based physical activities while still leaving room for improvement. Across dimensions, communication and peer-related behaviors were widely observed, suggesting

that the shared goal, synchronized movement, and mutual dependence embedded in bakiak naturally encourage students to speak politely, listen, respond, and engage with peers. However, conflict management emerged as the comparatively weaker domain, with a larger proportion of students showing lower consistency in negotiation, rule agreement, and resolving difficulties during play. This implies that cooperative games alone may be insufficient to strengthen higher-order interpersonal regulation unless supported by explicit teacher scaffolding, structured reflection, and repeated practice opportunities. By demonstrating how a culturally rooted team game functions as a practical learning medium for social development, the study contributes to the evidence base for ethnopedagogical PJOK and supports the dual agenda of strengthening children's social competence while sustaining local cultural heritage. Future research should test stronger causal claims through quasi-experimental designs, extend implementation duration, and combine quantitative scoring with qualitative observation to capture classroom dynamics more comprehensively.

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