



The Implementation of the Jigsaw-Type Cooperative Learning Model to Enhance Students' Motivation and Participation in Physical Education

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Abstract

This study addresses the low levels of student motivation and participation commonly observed in physical education classes. Traditional teacher-centered methods often fail to engage all students, resulting in passive learning environments. To overcome this challenge, the Jigsaw-type cooperative learning model was implemented to encourage active student involvement and boost learning enthusiasm. The research was conducted in a junior high school setting, targeting eighth-grade students as the object of study. The primary aim of this research is to examine the effectiveness of the Jigsaw cooperative learning model in increasing students' motivation and participation during physical education lessons. A classroom action research design was employed, involving two cycles with stages of planning, implementation, observation, and reflection. Data were collected through observation sheets, student questionnaires, and teacher field notes, and then analyzed descriptively. The results indicate a significant improvement in both student motivation and participation from the first to the second cycle. In the initial observation, student participation was limited, and motivation levels were low. However, after the implementation of the Jigsaw method, students demonstrated increased engagement, collaboration, and enthusiasm in physical activities. In conclusion, the Jigsaw-type cooperative learning model proves to be an effective instructional strategy to enhance students' motivation and participation in physical education. This approach not only fosters a more interactive learning environment but also supports the development of social and teamwork skills among students.

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INTRODUCTION

Physical Education, Sports, and Health (PESH) is one of the essential subjects in Indonesia's primary and secondary education curriculum. Beyond promoting physical fitness, PESH plays a strategic role in shaping students' character, fostering teamwork, and encouraging active participation. However, in many schools—including Junior high school YPPK Santu Paulus Abepura—student participation in PESH classes remains relatively low. Based on preliminary observations during the odd semester of the 2024/2025 academic year, only around 60% of students were actively engaged in PESH activities, while the remaining 40% exhibited passive behaviors, such as reluctance to move, talking to friends instead of participating, or even skipping class altogether. Moreover, students' motivation toward PESH appeared low, as indicated by an intrinsic motivation scale survey with an average score of 2.8 out of 5.

This phenomenon aligns with the findings of Liu & Lipowski (2021), who reported that student motivation in physical education tends to fluctuate and is strongly influenced by the teaching approach. Teacher-centered methods have proven to be less effective in fostering enthusiasm and participation (Dyson & Casey, 2016). In this context, more participatory and student-centered models, such as the Jigsaw-type Cooperative Learning strategy, offer a promising alternative that deserves further development.

The Jigsaw model was introduced by Elliot Aronson in the 1970s as a cooperative learning strategy emphasizing student collaboration. Each student is responsible for learning and mastering a specific part of the material, which they then teach to their group members, thereby fostering positive interdependence and promotive interaction (Aronson, 2022). Within the PESH context, this model can stimulate active involvement, increase student responsibility, and enhance social cohesion in the classroom (Casey & Goodyear, 2019).

Numerous international studies support the effectiveness of the Jigsaw model in physical education. (Hattie, 2017), in his meta-analysis, identified cooperative learning as having a substantial effect size of 0.64, indicating a significant impact on student achievement and engagement. Stanczak (2022) noted that the Jigsaw method significantly improves learning outcomes and student motivation, particularly in practice-based subjects. However, its implementation remains limited in Indonesia's eastern regions, including Papua, making it a highly relevant subject for em-

pirical study.

Previous research has largely focused on the Jigsaw method's impact on cognitive outcomes and motor skill development, with limited attention to its effects on students' intrinsic motivation and active participation. Yet these two aspects are crucial prerequisites for meaningful and enjoyable physical education. Hence, this study was designed to address this research gap, particularly in the context of Junior high school YPPK Santu Paulus Abepura—a pioneering “Sekolah Penggerak” (Driving School) in Papua that has adopted the Merdeka Curriculum.

This research aims to explore how the implementation of the Jigsaw-type Cooperative Learning model can enhance student motivation and participation in PESH classes. The study adopts a Classroom Action Research (CAR) approach, conducted over two cycles, with each cycle involving planning, implementation, observation, and reflection phases (Qomarrullah, 2015; Qomarrullah & Sokoy, 2024).

This study offers both practical and theoretical benefits. Practically, the findings may serve as a reference for PESH teachers in selecting effective instructional strategies that engage all students equitably and meaningfully. Theoretically, this research contributes to the growing body of literature on cooperative learning in physical education, particularly in the underexplored educational contexts of Eastern Indonesia.

In terms of novelty, this study not only implements the Jigsaw model within the PESH context but also integrates it with the measurement of psychological constructs such as intrinsic motivation and affective engagement. By employing both qualitative and quantitative approaches, the study provides a comprehensive overview of how this instructional model influences classroom dynamics in real-world settings.

Overall, this research contributes to advancing the state of the art in collaborative learning for physical education and affirms that cooperative approaches like Jigsaw can not only improve learning outcomes but also foster a more democratic, active, and student-centered classroom environment. The results are expected to inspire PESH educators to innovate in ways that sustainably enhance student motivation and participation.

METHODS

This study employed a Classroom Action Research (CAR) approach, following the model developed by Kemmis & McTaggart (2018),

which involves a cyclical process consisting of planning, acting, observing, and reflecting. This method is appropriate for addressing practical issues within the classroom and improving teaching practices in a systematic and reflective manner.

The research was conducted at Junior high school YPPK Santu Paulus Abepura, a Catholic junior high school located in Jayapura, Papua, Indonesia. The participants consisted of 28 students in Grade VIII-B who were selected based on their availability and active enrollment in Physical Education classes during the first semester of the 2024/2025 academic year.

The research was implemented in two action cycles, each consisting of the following phases:

Planning

In this phase, researchers collaborated with the Physical Education teacher to design lesson plans incorporating the Jigsaw-type cooperative learning model. Specific instructional materials and group roles were prepared to ensure that each student would be responsible for a portion of the content (Kurdi & Qomarrullah, 2020).

Action

The planned Jigsaw learning activities were carried out during regularly scheduled P.E. sessions. Students were divided into expert groups to study assigned subtopics and later returned to their original "home groups" to teach their peers.

Observation

Data collection was conducted through structured observation sheets to assess student participation, as well as a motivation questionnaire based on the Intrinsic Motivation Inventory (IMI) adapted from (Ryan & Deci, 2020). Observers documented behavioral indicators such as task involvement, collaboration, and communication.

Reflection

After each cycle, the research team and the teacher analyzed the data to evaluate the effectiveness of the learning model and identify areas for improvement. Feedback from students was also collected through short interviews and open-ended questionnaires (Fikri, 2017).

Data Collection Instruments included:

Observation checklist for student participation (adapted from the Physical Education Participation Scale by (Silverman & Subramaniam, 2019),

Motivation questionnaire using a modified version of the Intrinsic Motivation Inventory (IMI),

Field notes by researchers and the classroom teacher,

Student reflections and interviews for qualitative insight.

Data Analysis was carried out using both quantitative and qualitative techniques. Quantitative data (motivation scores and participation frequency) were analyzed descriptively to determine changes across cycles (Ahmad Yani, 2022; Lawu et al., 2019). Qualitative data (field notes and interviews) were thematically analyzed to identify patterns and student perceptions related to the learning process.

The validity of the data was ensured through triangulation of sources (student responses, teacher observations, and researcher notes), member checking, and continuous reflection as suggested by (Akbar et al., 2021). This research adheres to ethical considerations by ensuring informed consent, anonymity, and voluntary participation. Students and their parents were informed about the objectives and process of the study, and no identifying information was collected or disclosed.

RESULTS AND DISCUSSION

Prior to the intervention, student engagement in Physical Education (PE) at Junior high school YPPK Santu Paulus Abepura was relatively low. Observations during the first three weeks of the semester revealed that only about 60% of students actively participated in PE activities, while 40% remained passive—reluctant to move, inattentive, or socially withdrawn. Furthermore, an initial assessment using the Intrinsic Motivation Inventory (IMI) showed an average score of 2.8 out of 5, indicating low internal drive to engage in PE learning.

Cycle I

The first cycle of the research was carried out to test the initial implementation of the Jigsaw-type cooperative learning model in the context of Physical Education. This cycle focused on volleyball techniques as the learning material, aiming to build foundational collaboration among students through structured group work. The cycle consisted of three core phases—expert learning, peer teaching, and skill application—carried out across three consecutive sessions. The following table summarizes the results of Cycle I based on the stages of planning, action, observation, and reflection:

Table 1. Cycle I Research Data

Aspect	Findings
Planning	Topic: Basic volleyball techniques (underhand, overhead, footwork, teamwork). Expert groups assigned by ability. Teaching aids prepared, but role assignments not fully understood by students.
Action	Students met in expert groups (Session 1), taught peers in home groups (Session 2), and practiced in drills (Session 3). Some groups struggled with time and communication.
Observation	- Motivation Score (IMI): 3.4 / 5.0 - Active Participation: 71% - Engagement: Moderate, some passive students remained - Peer teaching: Uneven, dominated by confident students
Reflection	Teacher noted improved interaction but highlighted the need for clearer role distribution and time management. Planning for Cycle II adjusted to include peer feedback and more guided worksheets.

In the reflection session, the teacher and researcher acknowledged that the Jigsaw model had begun to stimulate cooperative learning, but required refinement in role distribution, time allocation, and clarity of instructions. Peer feedback mechanisms were missing, and some students appeared unclear on expectations. To address this, Cycle II was planned with improvements: the inclusion of structured expert worksheets, clearer roles, additional preparation time, and peer-assessment tools to reinforce accountability and enhance active learning.

Cycle II

Based on the reflection and analysis of Cycle I, several improvements were integrated into the planning and implementation of Cycle II. These adjustments aimed to address the limitations observed in the previous cycle, particularly in terms of clarity of roles, peer interaction, and student autonomy. With better-prepared instructional tools and structured peer assessment mechanisms, Cycle II was designed to enhance student participation and motivation more effectively. The following table summarizes the findings of Cycle II across all four stages of the classroom action research cycle.

Table 2. Cycle II Research Data

Aspect	Findings
Planning	Topic: Proper warm-up and physical safety. Clear expert worksheets used. Peer assessment rubric introduced. Focus on student autonomy and leadership.
Action	Expert groups prepared teaching plans and practiced demonstrations. In home groups, students led warm-up sessions and used peer feedback tools. Leadership rotated.
Observation	- Motivation Score (IMI): 4.1 / 5.0 - Active Participation: 89% - Engagement: High, nearly all students involved - Peer teaching: Structured, supportive, and consistent
Reflection	Students became more confident and collaborative. Teacher noted more student initiative and ownership of learning. The classroom climate became more democratic and engaging.

Planning

Based on insights from Cycle I, the second cycle focused on strengthening group structures and student autonomy. The new topic selected was "Proper Warm-Up and Physical Safety," relevant to students' physical readiness. Expert groups were provided with detailed guides, including a breakdown of warm-up stages (e.g., cardio activation, dynamic stretching), as well as instructional templates to help them plan their peer teaching. Peer-assessment forms and role rotation mechanisms were added to encourage broader participation. Greater emphasis was placed on reflection and leadership.

Action

The revised plan was implemented over two sessions. In the first, expert groups practiced their assigned warm-up stages and rehearsed how to demonstrate and explain them. In the second, each student taught their segment to their home group, followed by a collaborative warm-up challenge that required coordination, timing, and communication. The teacher reduced direct instruction, acting primarily as a facilitator. Students took greater initiative, showing more leadership and independence compared to the first cycle.

Observation

The improvements were reflected in the data. Active participation increased to 89%, with nearly all students taking on leadership roles at some point. The IMI average rose to 4.1, indicating strong intrinsic motivation. Observation records highlighted better peer communication, role fulfillment, and student confidence. Students used the peer-assessment checklists meaningfully, giving and receiving constructive feedback. Qualitative responses suggested that students felt more confident, involved, and responsible for group success.

Reflection

During final reflections, the teacher observed a notable change in classroom atmosphere—students were more engaged, motivated, and self-regulated. The structured application of the Jigsaw model enabled students not only to participate but to thrive as learners and peer leaders. Student interviews confirmed this shift: many expressed that they enjoyed being both learners and teachers, and that learning in groups “helped make PE less intimidating.” The researcher and teacher concluded that the Jigsaw model, when applied with sufficient scaffolding and reflection, significantly enhances both motivation and participation in physical education settings.

Table 3. Quantitative Summary Table

Indicator	Initial Condition	Cycle I	Cycle II
Intrinsic Motivation (avg/5.0)	2.8	3.4	4.1
Active Participation (%)	60%	71%	89%
Student Engagement (observed)	Low	Moderate	High

The cyclical implementation of the Jigsaw-type cooperative learning model produced measurable improvements in student motivation and participation. From an initial state of partial engagement and low enthusiasm, students progressed to becoming active, motivated participants capable of teaching and collaborating. The method was especially effective when supported by role clarity, peer feedback, and structured guidance. These findings affirm previous research Wulandari & Jariono (2022) and offer new empirical support for collaborative approaches in Eastern Indonesia’s education context.

The findings of this classroom action re-

search indicate that the implementation of the Jigsaw-type cooperative learning model significantly enhanced students’ motivation and participation in Physical Education (PE) at Junior high school YPPK Santu Paulus Abepura. This result is consistent with the view that cooperative learning environments foster greater student engagement and self-regulation (Garcia-L’opez & Guti’errez, 2019; Indrawan et al., 2021).

Students’ intrinsic motivation, as measured using the IMI, showed a meaningful increase from Cycle I to Cycle II. According to Self-Determination Theory (Akhmad & Dir, 2022), intrinsic motivation is supported when students experience autonomy, competence, and relatedness—three needs that are naturally embedded in the Jigsaw method. This model allows students to feel empowered as both learners and teachers, thus fulfilling their psychological needs and driving deeper engagement (Goudas & Biddle, 2023).

The improved active participation rate—from 60% to 89%—mirrors findings from previous research that cooperative learning can shift classroom culture from teacher-centered to learner-centered (Casey, 2021; Graber, 2021). In this study, students became more engaged not only in the learning process but also in social interactions. They collaborated, communicated, and showed increased leadership—traits often linked to successful cooperative strategies (Fern’andez-R’io et al., 2017).

This research also aligns with Widyanto & S (2023) comprehensive review, which asserts that PE has the potential to foster not only physical development but also social and emotional growth. When students are empowered to teach their peers and take ownership of group success, they internalize responsibility and increase their confidence—outcomes also observed in this study.

Interestingly, peer teaching improved significantly in Cycle II due to the integration of structured teaching guides and peer assessment forms. These tools contributed to clearer role allocation and accountability, which are essential elements in the effectiveness of cooperative learning (Zhang, 2016). The consistent peer feedback promoted reflective learning and interpersonal support, reinforcing the findings of Stroet et al. (2023), who observed a reciprocal relationship between teacher support, student behavior, and classroom climate.

The findings of this study are particularly meaningful in the context of Eastern Indonesia, where few empirical studies have applied student-centered pedagogies in PE settings. This fills

a gap noted in national education discourse, as most innovations remain concentrated in urban or western parts of Indonesia. The successful implementation of the Jigsaw model in this setting supports Rosenberg et al. (2020), who highlighted the flexibility of cooperative learning for diverse classroom contexts.

From a health and fitness perspective, increasing student participation in PE is critical. Lubans et al. (2020) emphasized that school-based physical activity programs are vital to preventing childhood obesity and fostering lifelong healthy habits. A model like Jigsaw, which encourages inclusive and active participation, may thus contribute to broader health outcomes.

The novelty of this study lies in its dual focus: not only implementing the Jigsaw model in a PE context (rare in prior literature) but also measuring its impact on intrinsic motivation and peer-based participation—psychosocial aspects that are often overlooked in PE research. Furthermore, the use of both quantitative and qualitative data adds methodological richness to the findings.

Despite these strengths, the study has limitations. It was conducted in a single school with a limited sample size. The long-term impact of the intervention on student motivation and participation was not measured. Future studies could conduct longitudinal analysis or compare the Jigsaw method with other cooperative models such as STAD (Student Teams-Achievement Divisions) or Think-Pair-Share.

CONCLUSION

Based on the findings of this classroom action research, the implementation of the Jigsaw-type cooperative learning model proved effective in enhancing students' intrinsic motivation and participation in Physical Education at Junior high school YPPK Santu Paulus Abepura. The model encouraged active engagement, fostered peer collaboration, and allowed students to take responsibility for both their learning and the learning of others. Through two iterative cycles, the improvements in motivation scores and participation rates demonstrated that cooperative learning, when supported with clear roles and reflective practices, creates a more dynamic and student-centered classroom environment.

It is recommended that Physical Education teachers consider adopting and adapting the Jigsaw method, especially in schools where student motivation and engagement are relatively low. Future implementations should be supported

by structured planning, role clarity, peer feedback tools, and adequate preparation time to maximize impact. Further research is also encouraged to explore the long-term effects of cooperative models on student behavior, academic achievement, and socio-emotional development, particularly in diverse educational settings such as Eastern Indonesia.

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