

**Effect of cooperative learning strategy on student engagement
in Physical Education among Grade 9 students**

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ABSTRACT

This study examined the effect of the Cooperative Learning Strategy on the engagement of Grade 9 students in Physical Education at Don Vicente Rama Memorial National High School during School Year 2025–2026. Anchored on Self-Determination Theory, Social Cognitive Theory, and Constructivist Learning Theory, the study employed a quasi-experimental pretest-posttest control group design. A total of 50 Grade 9 students participated, with 25 students assigned to the control group and 25 to the experimental group. The experimental group received instruction through cooperative learning activities, while the control group was taught using conventional instruction. An adapted Student Engagement in Physical Education Questionnaire was administered before and after the intervention to measure behavioral, emotional, and cognitive engagement. Data were analyzed using the mean, standard deviation, and t-test. The pretest results indicated low levels of engagement in both groups. In the posttest, the control group recorded slight increases, whereas the experimental group obtained higher mean scores across the three dimensions of engagement. The t-test results showed statistically significant differences between the posttest scores of the two groups, with the experimental group recording higher scores. These findings suggest that the Cooperative Learning Strategy contributed to improved behavioral, emotional, and cognitive engagement among the participating students under the conditions of the study. The study recommends the appropriate integration of structured cooperative learning activities into Physical Education instruction and further research involving larger and more diverse samples.

Keywords: Physical Education and Sports, cooperative learning strategy, student engagement, Grade 9, quasi-experimental design.

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INTRODUCTION

Physical Education (PE) is an important component of basic education because it contributes to the holistic development of learners in terms of physical competence, social interaction, emotional well-being, and cognitive growth. In the school setting, PE provides opportunities for students to participate in movement-based activities that develop not only fitness and motor skills but also discipline, teamwork, self-confidence, and decision-making.

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Because of its active and participatory nature, PE requires students to be meaningfully involved in classroom tasks and learning experiences. In this regard, student engagement is a vital consideration in PE instruction, as it reflects the extent to which learners participate behaviorally, respond emotionally, and invest cognitively in classroom activities. Recent literature describes engagement as a multidimensional construct consisting of behavioral, emotional, and cognitive dimensions, making it a relevant framework for understanding how students respond to teaching and learning processes in PE classes (Bond, 2020; Heilporn et al., 2024; Stringfellow et al., 2024).

Within the Philippine educational context, strengthening student engagement remains an important concern, particularly in public schools where teachers often handle large classes, diverse learner needs, and limited instructional resources. In PE, these classroom conditions may affect the extent to which students actively participate, sustain interest, and mentally invest in lesson activities. Since PE depends heavily on interaction, active involvement, and persistence, low or inconsistent engagement may weaken the effectiveness of instruction and limit students' learning experiences. This makes engagement an important educational outcome that deserves closer attention, especially among junior high school learners, who are at a stage where participation, interest, and classroom responsiveness may significantly influence their attitudes toward school and learning.

Although cooperative learning is already recognized in the literature as a learner-centered approach in Physical Education, the present study is not mainly intended to re-establish its general value as a teaching strategy, but rather to examine whether its use can specifically improve student engagement in PE. Existing studies have shown that cooperative learning may support participation, interaction, and positive learning experiences, but much of the discussion has focused broadly on motivation, social development, achievement, or general learning outcomes rather than directly examining engagement as a behavioral, emotional, and cognitive construct (Bores-García et al., 2021; Zach et al., 2023; Boke et al., 2025). Thus, the need is not merely to discuss the strategy itself, but to determine whether its classroom use can produce measurable improvements in student engagement.

Moreover, while there is growing international evidence on cooperative learning in PE, there remains a need for studies situated in the local school setting, particularly in public secondary schools in Cebu City. Much of the available literature is drawn from foreign contexts, and fewer studies appear to have directly examined the effect of cooperative learning on the engagement of junior high school students, specifically Grade 9 learners, in Philippine public school PE classes. This creates a contextual gap, since local school realities, learner characteristics, and instructional conditions may differ from those reported in international research. Therefore, despite the growing body of literature, there is still a need to generate local empirical evidence that can confirm whether cooperative learning is effective in improving the behavioral, emotional, and cognitive engagement of Grade 9 students in Physical Education.

For this reason, the present study is justified. By employing a quasi-experimental design, the study sought to determine whether cooperative learning can significantly influence student engagement in PE among Grade 9 students in a public secondary school in Cebu City. The findings of the study are expected to provide evidence that may help teachers and school administrators strengthen PE instruction through approaches that are more responsive to student engagement and participation.

Statement of the problem

This study determined the effect of cooperative learning strategy on student engagement in Physical Education among Grade 9 students at Don Vicente Rama Memorial National High School during School Year 2025–2026.

Specifically, this study sought to answer the following questions:

1. What is the demographic profile of the respondents in terms of age, sex, frequency of participation in physical activities, and previous participation in school sports?
2. What is the level of student engagement of the control group and experimental group before and after the intervention in terms of behavioral engagement, emotional engagement, and cognitive engagement?
3. Is there a significant difference between the pretest and posttest engagement scores of the control group?
4. Is there a significant difference between the pretest and posttest engagement scores of the experimental group?
5. Is there a significant difference between the posttest engagement scores of the control group and the experimental group?
6. Based on the findings, what intervention may be proposed to enhance student engagement in Physical Education?

METHODOLOGY

Research design

This study employed a quasi-experimental research design, specifically the pretest-posttest control group design, to determine the effect of cooperative learning strategy on student engagement in Physical Education among Grade 9 students in a public secondary school in Cebu City. This design was appropriate because it allowed the researcher to compare the engagement levels of the control and experimental groups before and after the intervention.

A quantitative approach was used since the study involved the collection of numerical data and the use of statistical tools to analyze the results. The experimental group was exposed to the cooperative learning strategy, while the control group was taught using the usual teaching approach. Pretest and posttest were administered to both groups to determine whether the strategy produced significant changes in behavioral, emotional, and cognitive engagement. Thus, the quasi-experimental design was considered most suitable because it allowed the study to measure the effect of the intervention in an actual classroom setting.

Respondents and locale of the study

The respondents of this study consisted of Grade 9 students from one (1) selected section of Don Vicente Rama Memorial National High School in Cebu City during the School Year 2025–2026. The selected section was composed of 50 students, who were divided into two groups: the experimental group and the control group. Half of the class was assigned as the experimental group, which was exposed to the cooperative learning strategy, while the other half served as the control group, which was taught using the usual teaching approach.

The study employed purposive sampling in selecting the Grade 9 section based on its availability, accessibility, and suitability for the implementation of the intervention. The division of students into control and experimental groups was done using non-random (intact group) assignment, which is appropriate for quasi-experimental research conducted in actual classroom settings.

The selection of Grade 9 students provided a focused investigation into student engagement in Physical Education at a critical stage of adolescent development. At this level, students are developing stronger social awareness, physical competence, and learning

motivation, making them suitable respondents for examining behavioral, emotional, and cognitive engagement in PE classes.

Research instrument

This study utilized an adapted survey questionnaire, specifically the Student Engagement in Physical Education Questionnaire, to gather data on the effect of cooperative learning strategies on students' engagement in Physical Education. The questionnaire served as the primary research instrument and was used to measure the level of student engagement among the control and experimental groups before and after the intervention. It was administered as both a pretest and posttest to determine changes in student engagement following the implementation of the cooperative learning strategy.

The instrument consisted of two parts. The first part gathered the demographic profile of the respondents, including age, sex, frequency of participation in physical activities, previous participation in school sports, and years of exposure to Physical Education. The second part measured student engagement across three dimensions: behavioral engagement, emotional engagement, and cognitive engagement. Each dimension contained five items, for a total of fifteen items.

The questionnaire used a four-point Likert scale: 4 – Strongly Agree, 3 – Agree, 2 – Disagree, and 1 – Strongly Disagree. It was adapted from established and validated instruments, particularly the Student Engagement Instrument by Appleton et al. (2006), the multidimensional engagement framework of Fredricks et al. (2004), and the Engagement in Physical Education Scale developed by Stringfellow et al. (2024). The items were modified to fit the context of Grade 9 Physical Education and were subjected to expert validation before administration.

Data analyses procedure

After the necessary consent was obtained, the survey questionnaires were distributed to the selected student-respondents during a scheduled period approved by the school administration. Before the administration of the questionnaire, the researcher provided clear and appropriate instructions regarding how each part of the instrument should be answered. The researcher was present throughout the data-gathering process to clarify questions or concerns raised by the respondents and to ensure the proper and complete accomplishment of the questionnaire. The respondents were given sufficient time to answer the instrument independently, allowing them to provide honest and accurate responses based on their actual experiences and perceptions. Upon completion, the questionnaires were collected immediately to minimize the possibility of loss, alteration, or contamination of the gathered data. Throughout the entire process, the researcher-maintained neutrality and avoided any actions or statements that could influence or direct the respondents' answers.

Post-data gathering stage

After the completion of the data-gathering process, all accomplished questionnaires were collected, consolidated, and systematically organized for data processing. The responses were carefully checked for completeness and consistency before being grouped according to the variables and indicators of the study. The data were subsequently coded, tabulated, and prepared for statistical analysis. Appropriate statistical tools were employed to analyze and interpret the gathered information in accordance with the objectives and research questions of the study. Throughout the data-processing stage, utmost care was exercised in maintaining the

confidentiality and anonymity of the respondents. The accomplished questionnaires and corresponding digital records were securely stored, and access to the collected data was restricted to the researcher. The analyzed results were interpreted based on the objectives of the study and served as the basis for developing a proposed intervention program aimed at enhancing student engagement in Physical Education in public secondary schools.

Statistical treatment of data

The data gathered from the respondents were analyzed using appropriate descriptive and inferential statistical techniques. Descriptive statistics, particularly frequency, percentage, mean, and standard deviation, were used to summarize and present the characteristics of the collected data in an organized and understandable manner. Frequency and percentage were used to describe the demographic profile of the respondents, while the mean was utilized to determine the extent to which the identified teaching strategies were employed by Physical Education teachers and to assess the level of student engagement in terms of its behavioral, emotional, and cognitive dimensions. The standard deviation was used to determine the variability or dispersion of the respondents' responses around the mean, thereby providing an indication of the consistency or variation in their assessments.

In addition to descriptive statistics, inferential statistics were employed to examine the relationships among the variables and to test the hypotheses of the study. Specifically, the Pearson Product-Moment Correlation Coefficient (Pearson's r) was used to determine whether a significant relationship existed between the teaching strategies employed in Physical Education and the students' level of engagement in terms of behavioral, emotional, and cognitive components. The Pearson r analysis provided information regarding the direction and strength of the relationship between the independent variable, teaching strategies, and the dependent variable, student engagement. The results of the statistical analyses were then interpreted in relation to the research objectives and hypotheses and were used as a basis for drawing conclusions and formulating the proposed intervention program.

RESULTS AND DISCUSSION

This chapter presents, analyzes and interprets the data gathered in this research study. The various results were presented in the succeeding tables with corresponding discussions and explanations. It also answered specific problems given in the previous chapter.

This chapter presents, analyzes, and interprets the data gathered from the Grade 9 student-respondents regarding the effect of the Cooperative Learning Strategy on student engagement in Physical Education. The data are organized according to the research questions of the study, which include the demographic profile of the respondents, the level of student engagement before and after the implementation of the Cooperative Learning Strategy, the significant difference between the pre-test and post-test results, and the effectiveness of the strategy in enhancing behavioral, emotional, and cognitive engagement among students in Physical Education classes.

Demographic profile of the respondents

This section presents the demographic profile of the Grade 9 student-respondents who participated in the study. The profile variables include age, sex, participation in physical activities, and previous participation in school sports. These variables were considered

important in describing the personal and educational background of the respondents, as well as in determining possible factors that may influence their level of engagement in Physical Education classes.

Age and sex were included to identify the distribution of respondents and to determine whether differences in maturity level and gender-related experiences may affect participation and interaction during cooperative learning activities. Participation in physical activities was also examined to determine the extent to which students are actively involved in exercise, recreational activities, or fitness-related practices outside the classroom. Meanwhile, previous participation in school sports was included to identify students' prior exposure to organized sports activities, which may contribute to their confidence, teamwork skills, communication, and overall engagement during Physical Education lessons.

The demographic data gathered provide a clearer understanding of the respondents' characteristics and serve as a foundation for interpreting the results of the study.

Table 2 presents the demographic characteristics of the respondents in terms of age, sex, participation in physical activities, and previous involvement in school sports. The data reveal that the majority of the respondents are 15 years old, comprising 70% of the total sample. This is followed by those aged 16 years old (12%), while only a small proportion belongs to ages 17 and 19, each accounting for 2% of the respondents. In terms of sex, the distribution is relatively balanced, with 52% female and 48% male respondents, indicating that both genders are adequately represented in the study. With regard to participation in physical activities, most respondents engage in such activities 1–2 times per week (34%), followed by 3–4 times per week (28%), and daily participation (24%). Only a small percentage (4%) reported rare participation.

This suggests that while many students are physically active, the frequency varies among individuals. Furthermore, when considering previous participation in school sports, the respondents are evenly divided, with 50% indicating prior involvement and 50% reporting no experience. This balance implies that the sample includes both experienced and non-experienced individuals in school sports activities.

The findings show that most respondents are 15 years old, comprising 70% of the total sample, with a mean age of 15 ± 0.81 . This implies that the respondents are within the adolescent stage, a period when peer interaction, teamwork, and active participation are important in learning. Since cooperative learning emphasizes collaboration, shared responsibility, and group participation, it is appropriate for Grade 9 students in Physical Education. This supports the findings of Boke et al. (2025), who reported that cooperative learning in Physical Education improves students' affective, cognitive, physical, and social learning outcomes.

In terms of sex, the respondents are almost equally distributed, with 52% female and 48% male. This implies that both male and female students are adequately represented in the study. The balanced sex distribution strengthens the interpretation of the results because the effect of cooperative learning on student engagement can be observed from both groups. UNESCO (2021) emphasized that inclusive quality Physical Education should promote equal participation regardless of sex, ability, or background.

Regarding participation in physical activities, the results show that 34% of the respondents participate 1–2 times per week, 28% participate 3–4 times per week, 24% participate daily, and 4% rarely participate. This implies that most students have some level of exposure to physical activities, although their frequency of participation differs. Students who are more physically active may find it easier to participate in Physical Education tasks, while those with limited activity may need more encouragement and peer support. The World Health Organization (2020) recommends that adolescents engage in at least 60 minutes of moderate-to-vigorous physical activity daily to support health and development.

Furthermore, previous participation in school sports is equally divided, with 50% answering “Yes” and 50% answering “No.” This implies that the respondents include both students with prior sports experience and those without formal school sports exposure. This is important because cooperative learning may help reduce performance gaps between experienced and less-experienced students. Through group activities, peer assistance, and shared roles, students who are less confident in Physical Education may become more involved. Casey and Quennerstedt (2020) explained that cooperative learning in Physical Education supports meaningful learning experiences by emphasizing interaction, cooperation, and shared participation.

Overall, the demographic profile suggests that the respondents have varied backgrounds in terms of age, sex, physical activity involvement, and sports experience. These differences may influence their behavioral, emotional, and cognitive engagement in Physical Education. However, such diversity also makes cooperative learning more relevant, as the strategy allows students to learn with and from one another. The findings imply that cooperative learning can be useful in creating a more inclusive, participative, and supportive Physical Education environment for Grade 9 students.

Level of student engagement of the control group and experimental group before and after the intervention

This section presents the level of student engagement of the control group and experimental group before and after the implementation of the intervention. The data focus on the behavioral, emotional, and cognitive engagement of Grade 9 students in Physical Education classes. The pre-intervention results were gathered to determine the initial level of student engagement of both groups prior to the application of the Cooperative Learning Strategy, while the post-intervention results were used to assess changes in engagement after the intervention period.

The comparison between the control group and experimental group provides a clearer understanding of the effectiveness of the Cooperative Learning Strategy in enhancing student engagement. Through the analysis of the pre-test and post-test results, the study determines whether the intervention contributed to improvements in students’ participation, interest, interaction, motivation, and involvement during Physical Education activities.

Table 3 presents the level of behavioral, emotional, and cognitive engagement of both the control and experimental groups before and after the intervention. Prior to the intervention, both groups exhibited low levels of engagement, with mean scores generally falling within the “Disagree” range based on the given scale. The control group recorded mean scores of 2.28 for behavioral engagement, 2.37 for emotional engagement, and 2.05 for cognitive engagement. Similarly, the experimental group showed slightly higher but still low engagement levels, with mean scores of 2.34, 2.46, and 2.30, respectively.

After the intervention, the control group showed only slight improvements. While emotional engagement increased to a level categorized as “Agree,” behavioral and cognitive engagement remained relatively low, indicating minimal change. In contrast, the experimental group demonstrated a substantial increase in all three dimensions of engagement. Behavioral, emotional, and cognitive engagement all reached mean scores within the “Strongly Agree” range. This indicates that the intervention had a significant positive effect on enhancing student engagement among participants in the experimental group.

The low pre-intervention engagement levels observed among both the control and experimental groups suggest that students initially demonstrated limited participation,

motivation, and cognitive involvement in Physical Education classes. These findings may imply that conventional instructional approaches previously experienced by the students were not sufficient to promote active interaction, collaboration, and meaningful engagement during classroom activities. In many traditional Physical Education settings, instruction is often teacher-centered, where students passively follow directions rather than actively participate in collaborative learning experiences. According to Gillies (2020), student engagement significantly increases when learners are provided with opportunities for interaction, shared problem-solving, and cooperative participation within the classroom environment. Likewise, Esteban et al. (2021) emphasized that collaborative learning activities encourage learners to become more socially connected, motivated, and actively involved in academic tasks.

After the intervention period, the control group demonstrated only minimal improvements in behavioral, emotional, and cognitive engagement. Behavioral engagement increased slightly from 2.28 to 2.32, emotional engagement improved from 2.37 to 2.60, and cognitive engagement rose from 2.05 to 2.24. Although emotional engagement reached the “Agree” category, behavioral and cognitive engagement remained within the “Disagree” range. These findings imply that regular classroom instruction alone may contribute to slight improvements in students’ emotional connection to Physical Education activities, possibly due to classroom familiarity and routine participation. However, the changes were not substantial enough to produce high levels of engagement. This suggests that traditional teaching approaches may have limited capacity to sustain active participation, deep understanding, and meaningful interaction among students. A study by Liu and Chen (2022) found that passive learning environments often result in lower student participation and reduced motivation, particularly in activity-based subjects such as Physical Education.

In contrast, the experimental group exhibited a remarkable increase in all dimensions of engagement after exposure to the Cooperative Learning Strategy. Behavioral engagement increased from 2.34 to 3.62, emotional engagement improved from 2.46 to 3.70, and cognitive engagement rose from 2.30 to 3.73. All posttest mean scores fall within the “Strongly Agree” category, indicating a very high level of student engagement after the intervention. These findings imply that the Cooperative Learning Strategy was highly effective in improving students’ active participation, motivation, collaboration, emotional involvement, and cognitive investment during Physical Education classes. The substantial improvement suggests that cooperative learning created a more interactive, student-centered, and supportive learning environment that encouraged students to become more involved in classroom activities.

The significant increase in engagement among the experimental group further supports the idea that cooperative learning promotes meaningful learning experiences through peer interaction, teamwork, and shared responsibility. Students become more motivated when they are actively involved in group activities where they can communicate, cooperate, and support one another. According to Roseth et al. (2021), cooperative learning environments improve students’ academic engagement and social interaction because learners develop positive interdependence and shared accountability within group tasks. Similarly, a study conducted by Sürücü and Özdemir (2023) revealed that cooperative learning strategies in Physical Education significantly enhance students’ participation, enjoyment, teamwork skills, and classroom motivation compared to traditional instructional approaches.

Also, the findings imply that cooperative learning strategies can effectively address disengagement among adolescents by creating inclusive and enjoyable learning experiences. Students who are less confident or less physically active may become more willing to participate when they receive peer encouragement and emotional support from their group members. The intervention also appears to strengthen students’ confidence, communication skills, and willingness to contribute during Physical Education activities. According to Yang et al. (2024), cooperative learning positively influences students’ self-confidence,

communication abilities, and emotional engagement because collaborative activities reduce anxiety and encourage active involvement among learners.

In general, the results indicate that the Cooperative Learning Strategy had a positive and meaningful effect on the behavioral, emotional, and cognitive engagement of Grade 9 students in Physical Education. While the control group showed only minimal improvements, the experimental group demonstrated substantial and statistically significant increases in all dimensions of engagement after exposure to the intervention. These findings confirm that cooperative learning is an effective instructional strategy for promoting active participation, meaningful interaction, motivation, and collaborative learning experiences in Physical Education classes.

Difference between the pretest and posttest engagement scores of the control group

This section presents the difference between the pretest and posttest engagement scores of the control group in terms of behavioral, emotional, and cognitive engagement. The pretest scores were gathered prior to the implementation of the intervention to determine the initial level of student engagement, while the posttest scores were obtained after the intervention period to assess any changes in engagement among the respondents.

The analysis aims to determine whether there is a significant difference between the pretest and posttest engagement scores of the control group despite the absence of the Cooperative Learning Strategy intervention. The findings provide a basis for comparing the engagement levels of students who underwent conventional Physical Education instruction and help determine whether

Table 4 presents the comparison between pretest and posttest engagement scores within the control group. The findings indicate that there is no significant difference in behavioral engagement, as evidenced by a t-value of 0.618 and a p-value of 0.543, leading to the failure to reject the null hypothesis. This suggests that behavioral engagement remained relatively unchanged over time in the absence of the intervention.

However, emotional engagement shows a significant difference, with a t-value of 4.044 and a p-value of less than 0.001. Similarly, cognitive engagement also demonstrates a significant difference, with a t-value of 2.218 and a p-value of 0.036. In both cases, the null hypothesis is rejected. These results imply that even without the intervention, some improvement occurred in emotional and cognitive engagement within the control group, although the changes were not as pronounced.

Table 4 presents the difference between the pretest and posttest engagement scores of the control group in terms of behavioral, emotional, and cognitive engagement. The findings reveal that behavioral engagement did not show a significant difference, as indicated by a t-value of 0.618 and a p-value of 0.543, which is greater than the 0.05 level of significance. Consequently, the null hypothesis was failed to be rejected. This indicates that students' active participation, cooperation, and involvement in Physical Education activities remained relatively unchanged throughout the study when exposed only to conventional teaching methods. The findings imply that traditional instructional approaches alone may not be sufficient to significantly improve students' behavioral engagement in Physical Education classes.

The absence of significant improvement in behavioral engagement may suggest that teacher-centered instruction provides limited opportunities for collaborative participation, peer interaction, and active involvement among students. In many traditional Physical Education settings, students often follow instructions passively rather than actively engaging in

meaningful group interaction and shared learning experiences. According to Chiva-Bartoll et al. (2020), active and student-centered learning strategies are more effective in increasing participation and engagement because they encourage learners to become directly involved in the learning process. Similarly, Goodyear et al. (2021) emphasized that meaningful engagement in Physical Education is strengthened when students are provided with opportunities for interaction, autonomy, and collaborative activities.

However, emotional engagement demonstrated a significant difference between the pretest and posttest scores, with a t -value of 4.044 and a p -value of less than 0.001. Since the p -value is lower than the 0.05 level of significance, the null hypothesis was rejected. This indicates that students in the control group experienced some improvement in emotional engagement despite the absence of the Cooperative Learning Strategy intervention. Emotional engagement refers to students' feelings of enjoyment, motivation, interest, and emotional connection during classroom activities. The slight improvement may be attributed to students' growing familiarity with Physical Education routines, increased comfort with classmates and teachers, and continuous exposure to classroom activities over time.

The findings imply that regular participation in classroom activities may gradually enhance students' emotional responses toward learning, even under conventional instruction. According to Mercier and Silverman (2022), repeated participation in Physical Education activities can contribute to students' comfort, enjoyment, and confidence, particularly when classroom environments remain supportive and structured. Nevertheless, the improvement in emotional engagement observed in the control group remained limited compared to the substantial gains typically associated with interactive and collaborative instructional approaches.

Similarly, cognitive engagement also demonstrated a significant difference, with a t -value of 2.218 and a p -value of 0.036, leading to the rejection of the null hypothesis. This indicates that students showed some improvement in concentration, mental investment, and willingness to understand lesson content despite the absence of the intervention. The result suggests that continuous classroom exposure and routine participation in learning activities may contribute to gradual improvements in students' cognitive involvement. However, the increase remained relatively small, indicating that conventional instruction may not sufficiently stimulate deeper thinking, active problem-solving, and meaningful reflection among students.

The findings further imply that while traditional teaching approaches may contribute to slight improvements in emotional and cognitive engagement, they are less effective in significantly enhancing students' behavioral participation and overall engagement. Conventional Physical Education instruction may not consistently provide the collaborative and interactive experiences necessary to sustain high levels of student involvement and motivation. According to Hastie et al. (2021), student engagement in Physical Education becomes more meaningful when instructional approaches encourage interaction, shared responsibility, and active learning experiences rather than passive participation.

Furthermore, the limited improvements observed in the control group highlight the importance of implementing more interactive and student-centered instructional strategies in Physical Education. Students may naturally develop familiarity and comfort within classroom environments over time, but meaningful and substantial increases in engagement often require learning experiences that promote collaboration, communication, and active participation. A study conducted by Kerneža and Košir (2023) found that collaborative learning approaches significantly improve students' motivation, classroom participation, and cognitive involvement compared to conventional instructional methods.

Overall, the findings indicate that while some dimensions of engagement may improve gradually through routine classroom exposure, traditional teaching approaches alone are insufficient to produce substantial and meaningful increases in overall student engagement.

These results support the importance of implementing Cooperative Learning Strategy and other interactive instructional approaches in Physical Education to create more participative, motivating, and engaging learning experiences for Grade 9 students.

Difference between the pretest and posttest engagement scores of the experimental group

This section presents the difference between the pretest and posttest engagement scores of the experimental group in terms of behavioral, emotional, and cognitive engagement. The pretest scores were obtained prior to the implementation of the Cooperative Learning Strategy to determine the initial level of student engagement in Physical Education, while the posttest scores were gathered after the intervention period to assess changes in students' engagement following exposure to the strategy.

The analysis aims to determine whether the Cooperative Learning Strategy produced a significant effect on the engagement levels of Grade 9 students in Physical Education. By comparing the pretest and posttest scores, the study evaluates the extent to which the intervention enhanced students' participation, interest, interaction, motivation, and cognitive involvement during classroom activities. The findings also provide evidence regarding the effectiveness of cooperative learning as an instructional strategy in improving behavioral, emotional, and cognitive engagement among students.

The findings show that the Cooperative Learning Strategy produced a highly significant positive effect on the behavioral, emotional, and cognitive engagement of Grade 9 students in Physical Education. The large mean differences and high computed t-values demonstrate that the intervention substantially improved students' participation, interaction, motivation, cooperation, interest, and mental involvement during classroom activities. These results imply that cooperative learning creates a more engaging, interactive, and student-centered learning environment that encourages active participation and meaningful collaboration among learners.

The significant improvement in behavioral engagement suggests that students became more active, participative, and cooperative during Physical Education activities after exposure to the intervention. Through collaborative group tasks, peer interaction, shared responsibilities, and team-based activities, students were encouraged to participate more actively in classroom discussions and physical activities. The findings imply that cooperative learning promotes accountability and collective participation, allowing students to become more involved in the learning process. According to García-González et al. (2020), cooperative learning strategies significantly improve students' participation, teamwork, and classroom interaction because learners are motivated to contribute actively toward achieving common group goals. Similarly, Méndez-Giménez et al. (2021) found that cooperative activities in Physical Education increase students' behavioral engagement by encouraging interaction, communication, and peer support during learning tasks.

Likewise, the significant increase in emotional engagement indicates that students developed more positive feelings, enjoyment, confidence, and motivation toward Physical Education after the implementation of the Cooperative Learning Strategy. The intervention may have helped students feel more comfortable and emotionally supported because of the encouragement, acceptance, and assistance provided by group members. These findings imply that cooperative learning contributes to a more positive and inclusive classroom atmosphere, which strengthens students' emotional connection to learning activities. A study conducted by Baena-Morales et al. (2022) revealed that cooperative learning environments enhance students' enjoyment, motivation, and emotional well-being in Physical Education because collaborative activities reduce anxiety and increase learners' sense of belonging. In addition, Calderón et al.

(2021) emphasized that socially interactive learning experiences positively influence students' confidence, enjoyment, and willingness to participate during Physical Education classes.

Moreover, cognitive engagement recorded the highest mean difference among the three dimensions, indicating that the intervention greatly enhanced students' concentration, critical thinking, problem-solving abilities, and willingness to understand lesson content. These findings imply that cooperative learning encourages students to think actively, exchange ideas, reflect on tasks, and become more responsible for their own learning. Through collaborative discussions and shared problem-solving activities, students become mentally engaged in analyzing and completing classroom tasks. According to León et al. (2021), cooperative learning promotes deeper cognitive engagement because students actively participate in discussion, reflection, and decision-making processes during group activities. Likewise, Rivera-Pérez et al. (2023) explained that collaborative instructional approaches improve students' critical thinking skills and cognitive involvement by encouraging learners to communicate ideas, solve problems collectively, and evaluate their learning experiences.

The findings further suggest that the Cooperative Learning Strategy is more effective than traditional teaching methods in promoting meaningful student engagement in Physical Education. Unlike teacher-centered instruction, cooperative learning provides opportunities for students to interact, collaborate, and learn from one another in a supportive learning environment. This suggests that student-centered approaches are more capable of addressing disengagement and passive participation among adolescents. According to Hortigüela-Alcalá et al. (2020), cooperative learning enhances students' motivation and engagement because learners become active participants rather than passive recipients of instruction.

Also, the highly significant improvements observed across all engagement dimensions suggest that cooperative learning can serve as an effective intervention for addressing low participation and disengagement among secondary school students in Physical Education. The strategy creates an inclusive environment where students with varying abilities, confidence levels, and experiences can participate meaningfully in classroom activities. Students become more willing to engage because they receive peer encouragement, equal opportunities for participation, and emotional support from group members. This implies that cooperative learning not only improves academic engagement but also strengthens students' social interaction, communication skills, and self-confidence.

In total, the results clearly demonstrate that the Cooperative Learning Strategy had a significant and positive effect on the behavioral, emotional, and cognitive engagement of Grade 9 students in Physical Education. The intervention successfully increased students' active participation, motivation, collaboration, enjoyment, and cognitive involvement during classroom activities. Therefore, the study concludes that Cooperative Learning Strategy is an effective instructional approach for enhancing student engagement in Physical Education and may be recommended for wider implementation in secondary school Physical Education programs to promote active, inclusive, and meaningful learning experiences.

Difference between the posttest engagement scores of the control group and the experimental group

This section presents the difference between the posttest engagement scores of the control group and the experimental group in terms of behavioral, emotional, and cognitive engagement. The posttest scores were gathered after the implementation of the intervention to determine the extent of student engagement in Physical Education following exposure to either conventional instruction or the Cooperative Learning Strategy.

The analysis aims to determine whether a significant difference exists between the engagement levels of students in the control group and those in the experimental group after

the intervention period. Through the comparison of posttest scores, the study evaluates the effectiveness of the Cooperative Learning Strategy in enhancing students' behavioral, emotional, and cognitive engagement compared to traditional teaching methods. The findings provide evidence regarding the impact of cooperative learning on promoting active participation, motivation, collaboration, and cognitive involvement among Grade 9 students in Physical Education.

The findings specify that the experimental group achieved significantly higher levels of behavioral, emotional, and cognitive engagement compared to the control group after exposure to the Cooperative Learning Strategy. This strongly suggests that the intervention was highly effective in improving students' participation, motivation, collaboration, interaction, and mental involvement in Physical Education activities. The large mean differences further imply that the improvement experienced by the experimental group was substantial compared to students who underwent conventional instruction. These results indicate that cooperative learning provides a more engaging and interactive learning environment that encourages students to participate actively and meaningfully during classroom activities.

The significant difference in behavioral engagement suggests that students exposed to the Cooperative Learning Strategy became more active, cooperative, and participative during Physical Education lessons. Through collaborative group activities, shared tasks, peer interaction, and teamwork, students were encouraged to become more involved in classroom discussions and physical activities. This implies that cooperative learning promotes active participation because students feel responsible not only for their own learning but also for the success of their group members. According to Velázquez-Callado (2020), cooperative learning significantly enhances students' classroom participation and interaction because learners become more accountable and involved in achieving group objectives. Likewise, Sánchez-Hernández et al. (2021) found that cooperative instructional strategies improve behavioral engagement by increasing opportunities for communication, teamwork, and peer collaboration during Physical Education activities.

Correspondingly, the significant improvement in emotional engagement indicates that students in the experimental group developed more positive feelings toward Physical Education classes compared to those in the control group. The collaborative and supportive nature of cooperative learning may have enhanced students' enjoyment, confidence, motivation, and sense of belonging during activities. Students who experience encouragement and acceptance from peers are more likely to develop positive emotional connections with classroom learning. These findings imply that cooperative learning creates a more inclusive and emotionally supportive classroom environment that strengthens students' interest and enthusiasm in participating in Physical Education. According to Moreno-Guerrero et al. (2020), collaborative learning environments positively influence students' motivation, enjoyment, and emotional well-being because learners feel more connected and supported during classroom activities. In the same manner, Ferriz-Valero et al. (2021) emphasized that cooperative learning promotes positive social relationships and emotional engagement, which contribute to increased motivation and confidence among secondary school students.

Besides, cognitive engagement demonstrated the highest mean difference among all dimensions, indicating that cooperative learning greatly enhanced students' concentration, critical thinking, problem-solving skills, and understanding of lesson content. These findings suggest that students became more mentally invested in learning activities because cooperative tasks required them to communicate ideas, analyze situations, solve problems collaboratively, and reflect on their learning experiences. The intervention encouraged students to participate actively in discussions and decision-making processes, resulting in deeper cognitive

involvement during classroom activities. According to Gil-Arias et al. (2020), cooperative learning strategies improve cognitive engagement because students are exposed to reflective thinking, collaborative problem-solving, and meaningful interaction during learning tasks. Similarly, Pérez-Ordás et al. (2022) reported that cooperative learning enhances higher-order thinking skills and students' cognitive participation in Physical Education by encouraging learners to exchange ideas and construct knowledge collectively.

The findings further infer that the Cooperative Learning Strategy is more effective than traditional teaching methods in promoting meaningful student engagement in Physical Education. While the control group exhibited only slight or moderate improvements through conventional instruction, the experimental group achieved substantial gains across all dimensions of engagement. This suggests that teacher-centered instructional approaches may not sufficiently address the engagement needs of adolescents, particularly in activity-based subjects such as Physical Education. In contrast, cooperative learning provides opportunities for interaction, inclusion, communication, teamwork, and active participation, making students more engaged and motivated during learning activities. According to Baena-Morales and González-Víllora (2022), student-centered instructional strategies significantly improve students' participation, engagement, and learning experiences because learners become active contributors rather than passive recipients of instruction.

Still, the results indicated that cooperative learning may serve as an effective intervention for addressing disengagement and low participation among secondary school students. The strategy promotes inclusivity by allowing students with varying abilities, confidence levels, and prior sports experiences to participate meaningfully in classroom activities. Students become more willing to engage because they receive peer support, equal opportunities for participation, and encouragement from group members. This implies that cooperative learning not only improves engagement but also strengthens communication skills, teamwork, self-confidence, and social relationships among students. Recent studies from 2020 to 2025 consistently emphasize that collaborative learning environments positively influence students' academic engagement, social interaction, and sense of belonging within school settings.

The findings clearly demonstrate that the Cooperative Learning Strategy had a significant positive effect on the behavioral, emotional, and cognitive engagement of Grade 9 students in Physical Education. While both groups initially exhibited relatively low levels of engagement during the pretest, only the experimental group demonstrated substantial and statistically significant improvements after the intervention. The control group showed only minimal or moderate changes, whereas the experimental group achieved very high levels of engagement across all measured dimensions. Therefore, the study concludes that Cooperative Learning Strategy is an effective instructional approach for enhancing student engagement in Physical Education and may be recommended for wider implementation in secondary school teaching practices to promote active, collaborative, meaningful, and inclusive learning experiences.

CONCLUSION

Based on the significant findings of the study, it is concluded that the Cooperative Learning Strategy significantly improves the behavioral, emotional, and cognitive engagement of Grade 9 students in Physical Education. Students exposed to the strategy demonstrated greater participation, interest, motivation, interaction, collaboration, and mental involvement than those who received the usual teaching approach. The significant differences between the experimental group's pretest and posttest scores demonstrate that cooperative learning can effectively increase student engagement. Moreover, the significantly higher posttest scores of

the experimental group establish that the strategy is more effective than conventional instruction in promoting engagement in Physical Education. Therefore, the Cooperative Learning Strategy is an effective instructional approach for enhancing students' behavioral, emotional, and cognitive involvement in Physical Education classes.

Based on the findings and conclusions of the study, the following recommendations are offered to the identified beneficiaries. Grade 9 students are encouraged to participate actively and responsibly in cooperative Physical Education activities by contributing to group tasks, supporting their classmates, fulfilling assigned roles, and respecting differences in skills and abilities, as active participation may help sustain improvements in behavioral, emotional, and cognitive engagement. Physical Education teachers are encouraged to integrate the Cooperative Learning Strategy into their lessons through structured group activities that promote teamwork, peer support, shared responsibility, and individual accountability. Teachers may assign clear roles, form balanced groups, monitor individual participation, and provide timely feedback to ensure that all students are meaningfully involved, particularly since the strategy demonstrated positive effects across the three dimensions of student engagement. School administrators may support the implementation of cooperative learning by providing relevant training, instructional materials, appropriate equipment, and opportunities for Physical Education teachers to develop and share cooperative learning activities. They may also conduct classroom observations and provide instructional support to help teachers implement the strategy consistently and effectively. Parents and guardians are encouraged to motivate students to participate in physical activities and cooperative tasks and to reinforce positive attitudes toward teamwork, responsibility, respect, and active participation to help sustain students' engagement in Physical Education. Curriculum planners and school program coordinators may consider incorporating structured cooperative learning activities into Physical Education programs, ensuring that these activities address behavioral, emotional, and cognitive engagement while providing meaningful participation opportunities for students with varying abilities and levels of sports experience. Finally, future researchers are encouraged to conduct studies involving larger and more diverse samples from different sections, grade levels, schools, and learning areas to improve the generalizability of the findings. Future studies may also implement the intervention over a longer period to determine whether improvements in student engagement are sustained and may examine other relevant variables, such as academic performance, physical fitness, teamwork skills, self-confidence, and long-term retention. The use of qualitative approaches, including interviews, observations, and focus-group discussions, may likewise be considered to provide a deeper understanding of students' experiences and perceptions regarding the use of cooperative learning in Physical Education.

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