

Effectiveness of Student-Centered Instructional Strategies in Physical Education on Learners' Physical Fitness and Engagement

MARK BENNETTE M. ULEP

Isabela State University, Echague Campus, Echague, Philippines.

<https://orcid.org/0009-0009-6138-0274>, Email: markbennetteulepm@gmail.com

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ABSTRACT

This study examined the effectiveness of student-centered instructional strategies in Physical Education on learners' physical fitness and engagement. Physical Education plays a crucial role in promoting active lifestyles, yet traditional teacher-centered approaches often limit learners' participation and motivation. Using a quantitative quasi-experimental research design with a pretest–posttest approach, the study investigated whether student-centered strategies could improve learners' physical fitness outcomes and levels of engagement. Participants were learners enrolled in Physical Education classes who were exposed to student-centered instructional strategies, such as cooperative learning, task-based activities, and peer interaction, over an eight-week period. Data were collected using standardized physical fitness tests measuring cardiovascular endurance, muscular strength, and flexibility, as well as a validated learner engagement questionnaire assessing behavioral, emotional, and cognitive engagement. Descriptive statistics and paired t-tests were used to analyze changes in physical fitness, while engagement levels were examined using mean scores and interpretations. Results showed significant improvements in all physical fitness components after the implementation of student-centered instructional strategies. Learners also demonstrated high levels of engagement across all engagement dimensions, indicating increased motivation, enjoyment, and active participation in Physical Education classes. The findings suggest that student-centered instructional strategies are effective in enhancing both physical fitness and learner engagement. By actively involving learners in the learning process, these strategies promote meaningful participation and sustained physical activity. The study concludes that adopting student-centered approaches in Physical Education can support learners' holistic development and contribute to more effective and engaging PE instruction.

Introduction

Physical Education (PE) plays a vital role in promoting learners' physical fitness, healthy lifestyles, and positive attitudes toward physical activity. In recent years, educational reforms have emphasized the shift from teacher-centered instruction to student-centered instructional strategies that actively involve learners in the learning process. Student-centered approaches in Physical Education encourage autonomy, collaboration, problem-solving, and meaningful participation, which are essential in fostering both physical development and learner engagement.

Despite the recognized benefits of student-centered instruction, traditional, teacher-directed methods continue to dominate many PE classes, often limiting learners' motivation and participation. As a result, learners may fail to achieve optimal fitness outcomes and develop sustained interest in physical activity. This study was conducted to examine the effectiveness of student-centered instructional strategies in Physical Education and their influence on learners' physical fitness and engagement, providing empirical evidence to support learner-centered pedagogical practices.

Student-centered instructional strategies emphasize learners' active involvement in planning, performing, and reflecting on learning activities. In Physical Education, such strategies include cooperative learning, peer teaching, task-based activities, and problem-solving approaches. These strategies aim to address diverse learner needs while promoting physical competence and social interaction.

Physical fitness, which includes components such as cardiovascular endurance, muscular strength, flexibility, and agility, is a key outcome of effective PE instruction. Learner engagement behavioral, emotional, and cognitive is equally important, as it reflects learners' motivation, participation, and interest in physical activity. However, limited studies have simultaneously examined the impact of student-centered instructional strategies on both physical fitness and learner engagement, particularly within structured PE settings.

Research indicates that student-centered instructional strategies enhance learner engagement and motivation in Physical Education. According to Dyson, Griffin, and Hastie (2004), cooperative learning in PE promotes active participation and social interaction. Similarly, Casey and Goodyear (2015) reported that learner-centered pedagogies improve students' autonomy and enjoyment in PE classes.

Studies also show that instructional strategies influence physical fitness outcomes. Fairclough and Stratton (2005) found that activity-based and learner-centered PE lessons increase moderate-to-vigorous physical activity levels. Fredricks, Blumenfeld, and Paris (2004) emphasized that engagement is a multidimensional construct influenced by instructional practices.

While existing studies support the benefits of student-centered instruction in Physical Education, most focus either on learner engagement or physical fitness outcomes alone. There is limited empirical research that examines the combined effects of student-centered instructional strategies on both learners' physical fitness and engagement within the same study. Furthermore, localized studies examining these variables in actual PE classroom settings remain scarce. This study addresses these gaps by investigating the effectiveness of student-centered instructional strategies on both fitness and engagement outcomes.

Research Objectives

This study aimed to determine the effectiveness of student-centered instructional strategies in Physical Education on learners' physical fitness and engagement. Specifically, it sought to:

1. Assess learners' physical fitness before and after the implementation of student-centered instructional strategies.
2. Determine the level of learner engagement in Physical Education classes using student-centered approaches.
3. Examine the significant difference in learners' physical fitness before and after the intervention.
4. Determine the relationship between student-centered instructional strategies and learner engagement.

Research Methodology

The study employed a quantitative quasi-experimental research design using a pretest–posttest approach to determine the effectiveness of student-centered instructional strategies in Physical Education on learners' physical fitness and engagement. This design was appropriate as it allowed for the measurement of changes in learners' outcomes before and after exposure to the instructional intervention without random assignment to groups. The participants of the study were learners enrolled in Physical Education classes who were deliberately exposed to student-centered instructional strategies for a period of eight weeks. Purposive sampling was utilized to select participants who regularly attended PE classes to ensure consistent exposure to the intervention and reliability of the results.

The **intervention** involved the implementation of student-centered instructional strategies such as cooperative learning, task-based activities, peer interaction, and learner-led exercises designed to promote active participation and autonomy during PE sessions. These strategies emphasized sustained movement, collaboration, and learner responsibility in performing physical activities.

Data collection was carried out using standardized physical fitness tests to measure cardiovascular endurance, muscular strength, and flexibility, ensuring objectivity and comparability of results. Learner engagement was assessed using a validated questionnaire that measured behavioral, emotional, and cognitive engagement in Physical Education classes. Prior to data gathering, the instruments were reviewed to ensure validity and reliability.

Data analysis involved the use of descriptive statistics to summarize learners' physical fitness and engagement levels. Paired t-tests were employed to determine significant differences between pretest and posttest fitness scores, while Pearson's product–moment correlation coefficient was used to examine the relationship between student-centered instructional strategies and learner engagement. All statistical analyses were conducted at a 0.05 level of significance, and ethical

considerations such as informed consent, confidentiality, and voluntary participation were strictly observed throughout the study.

Results and Findings of the Study

Table 1. Physical Fitness Levels of Learners Before and After Student-Centered Instruction

Fitness Component	Pretest Mean	Posttest Mean	Mean Difference	Interpretation
Cardiovascular Endurance	32.40	38.90	+6.50	Improved
Muscular Strength	28.15	35.60	+7.45	Improved
Flexibility	21.30	26.85	+5.55	Improved

The results indicate clear and consistent improvements across all measured physical fitness components cardiovascular endurance, muscular strength, and flexibility following the implementation of student-centered instructional strategies in Physical Education. These improvements suggest that learners were able to engage more frequently and more effectively in physical activities that targeted various aspects of fitness. The increase in fitness scores reflects greater opportunities for movement, repeated practice of skills, and sustained participation during PE sessions, as student-centered lessons emphasized activity-based tasks, cooperative exercises, and learner involvement rather than prolonged teacher-led instruction.

These findings indicate that student-centered instruction effectively enhanced learners' physical fitness by promoting active participation and sustained physical activity throughout PE classes. When learners are placed at the center of the instructional process, they are more likely to take ownership of activities, remain engaged for longer periods, and exert consistent physical effort. Student-centered strategies create an environment that encourages continuous movement, peer interaction, and self-paced learning, all of which contribute to improved physical fitness outcomes. Consequently, adopting student-centered instructional approaches in Physical Education supports not only skill development but also the overall physical fitness and health of learners.

Table 2. Level of Learner Engagement in Physical Education

Engagement Dimension	Mean	Interpretation
Behavioral Engagement	4.28	High

Engagement Dimension	Mean	Interpretation
Emotional Engagement	4.22	High
Cognitive Engagement	4.18	High
Overall Engagement	4.23	High

The results revealed that learners demonstrated high levels of engagement across behavioral, emotional, and cognitive dimensions during Physical Education classes that employed student-centered instructional strategies. High behavioral engagement was evident through learners' active participation in activities, consistent involvement in tasks, and willingness to collaborate with peers. Emotional engagement was reflected in learners' enthusiasm, enjoyment, and positive attitudes toward PE activities, while cognitive engagement was demonstrated through learners' focus, effort, and willingness to think, reflect, and improve their performance. These findings indicate that learners were not only physically present in activities but were also emotionally and mentally invested in the learning process.

The high levels of engagement observed suggest that student-centered instructional strategies effectively fostered learners' motivation, enjoyment, and active involvement in Physical Education activities. By allowing learners to make choices, work collaboratively, and take responsibility for their learning, these strategies created a supportive and autonomy-enhancing environment. Such an environment encouraged learners to participate more willingly, sustain interest, and engage more deeply with physical tasks. As a result, student-centered instruction contributed to a more meaningful and enjoyable Physical Education experience, reinforcing its effectiveness in promoting both engagement and positive learning outcomes.

Table 3: Difference in Physical Fitness Before and After the Intervention

Variable	t-value	p-value	Interpretation
Overall Physical Fitness	6.74	0.001	Significant

The computed p-value obtained from the statistical analysis indicates a statistically significant improvement in learners' physical fitness following the implementation of student-centered instructional strategies in Physical Education. This result suggests that the observed increase in physical fitness levels after the intervention was not due to chance but can be attributed to the instructional approach used during the PE classes. The consistent improvements across multiple

fitness components, such as cardiovascular endurance, muscular strength, and flexibility, reflect the effectiveness of the intervention in promoting regular and sufficient physical activity among learners throughout the instructional period

These findings indicate that student-centered instructional strategies played a significant role in enhancing learners' physical fitness outcomes. By actively engaging learners through cooperative activities, task-based exercises, and opportunities for self-directed participation, student-centered approaches increased the amount of meaningful physical activity performed during PE sessions. This instructional design encouraged sustained effort, skill practice, and active movement, which are essential for improving physical fitness. Consequently, the results reinforce the value of adopting student-centered strategies in Physical Education as an effective means of promoting physical fitness development and supporting learners' overall health and well-being.

Discussion of the Study

The findings demonstrate that student-centered instructional strategies are effective in improving both physical fitness and learner engagement in Physical Education. The significant gains in cardiovascular endurance, muscular strength, and flexibility support previous studies highlighting the benefits of active and learner-centered PE instruction. High engagement levels indicate that learners were motivated and emotionally invested in PE activities, consistent with Fredricks et al. (2004) and Casey and Goodyear (2015). The results suggest that when learners are actively involved and given autonomy, both fitness outcomes and engagement improve.

Conclusions

The study concludes that student-centered instructional strategies in Physical Education significantly enhance learners' physical fitness and engagement. Learners exposed to these strategies demonstrated improved fitness levels and high engagement across behavioral, emotional, and cognitive dimensions. Student-centered instruction proves to be an effective pedagogical approach in promoting holistic development in Physical Education.

Recommendations

1. Physical Education teachers are encouraged to adopt student-centered instructional strategies to enhance fitness and engagement.
2. School administrators may support professional development programs focused on learner-centered PE pedagogy.
3. Curriculum planners may integrate student-centered approaches into PE standards and learning competencies.
4. Future studies may use longitudinal or mixed-methods designs to examine long-term effects on physical activity behavior.

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