

Problem-Based Learning to Improve 21st Century Collaborative Skills in Physical Education

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Abstract

Objective. This research delves into the implementation of a problem-based learning (PBL) model that aims to improve collaborative skills pertinent to the 21st century in the realm of physical education. The investigation measures the effectiveness of this approach in developing essential collaborative skills that are relevant to modern-day scenarios. The study assesses the impact of PBL on students' collaborative capabilities, providing valuable insights into the potential advantages of this pedagogical technique for nurturing vital skills crucial for success in the 21st century.

Materials and methods. This study utilized a Classroom Action Research (CAR) approach, following the Kemmis and McTaggart methodology. The Participatory Action Research method consisted of four main stages: planning, implementation, observation, and reflection. The research involved 25 students from Rumah Tahfidz Pelita Hati Klaten school.

Results. According to the findings of the study, a mere 20%, or five students out of the total number of students evaluated, were able to meet the minimum competency standards (KKM) during the pre-cycle phase. However, this figure rose to 36% or nine students in cycle I, and in cycle II, the percentage of students who achieved the MCS stood at an impressive 92%, which amounts to 23 students. These results indicate a significant improvement in the academic performance of the students from pre-cycle to cycle II.

Conclusions. The results obtained from the study indicate a significant improvement in the performance of students from cycle I to cycle II, thus providing evidence for the effectiveness of problem-based learning in the domain of physical education. The findings further imply that this approach fosters better teamwork and collaboration among students, thereby contributing to their overall growth and development.

Keywords: PBL, Collaborative Skills, Physical Education

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Introduction

Sports are physical activities that people of all ages can enjoy, from children to seniors., as emphasized by (Suryadi, Gustian, & Fauziah, 2022), It is a crucial element in human physical development, growth, and the cultivation of sporting talent, as highlighted by (Suganda, 2017) and (Suryadi, Saputra, & Wahyudi, 2022). Participating in sports activities is necessary to meet fundamental physical requirements. There are numerous studies that confirm the positive effects of engaging in physical activity through sports on physical fitness, as evidenced by research conducted by (Baek et al., 2020; Golubović, Maksimović, Golubović, & Glumbić, 2012; Suryadi, 2022a; Suryadi & Rubiyatno, 2022; Suryadi, Samodra, & Purnomo, 2021). A comprehensive review article underscores the significance of exercise in daily life, emphasizing its positive influence on health, as demonstrated by (Meo et al., 2021). As a result, numerous educational institutions include sports education in their curriculum by offering physical education classes.

Physical education is a mandatory subject in elementary, junior high, and senior high schools, with a focus on sports and health, according to (Rubiyatno & Suryadi, 2022), It holds a pivotal role in student development, as emphasized by (Iyakrus, 2019). and is a critical factor in achieving academic success for students, as supported by (Budi & Listiandi, 2021). Mustafa, (2017) further reinforces this notion, Active media is fundamental in building character in the context of physical education.

Teachers have a crucial role in motivating and facilitating the learning of sports within the school environment, as highlighted by (Aziz, Okilanda, Permadi, et al., 2023; Aziz, Okilanda, Rozi, Suganda, & Suryadi, 2023; Mashud, Arifin, et al., 2023; Mashud, Warni, et al., 2023; Tanri et al., 2023; Umar et al., 2023). In the realm of physical education, one of the objectives is to foster cooperation, as outlined (Rubiyatno & Suryadi, 2022). Collaboration involves multiple students working together, taking on responsibility, trusting one another, and assuming different roles to reach a shared understanding of problems and solutions, as defined by (Alexandra & Barton, 2017; Davis & Bos, 2018).

Collaboration stands out as a vital 21st-century skill crucial for both academic success and professional advancement, as underscored by (Tracy & Xu, 2018). Collaborative skills are vital for students as they allow them to share and expand their knowledge, which is essential for achieving their learning objectives. Collaboration not only improves students' knowledge, but also promotes social interactions. To incorporate collaboration into student learning, it is necessary to use student-centered methods, delegate tasks, take responsibility for assigned tasks, and effectively use social skills (Puspitasari, 2018).

After analyzing the results of the examination, it was found that students are facing challenges in thoroughly and appropriately executing assigned tasks. These difficulties are arising due to their struggles in articulating thought processes and a lack of collaboration with peers, as identified by (Siagian, Saragih, & Sinaga, 2019). After observing and discussing with sports teachers, it has been found that students face ongoing challenges when it comes to working together during learning sessions. A closer analysis of the group-based learning methods being used reveals that students are not actively engaging in discussions, failing to take ownership of their assigned tasks, neglecting the viewpoints and suggestions of their peers, and achieving subpar results when presenting their work.

As collaboration skills play a crucial role in modern education and are integrated into learning processes, researchers are exploring problem-based learning models to tackle these challenges. Therefore, this study aims to investigate the influence of problem-based learning models on the improvement of collaboration skills.

Materials and methods

Study participants.

The study was carried out on a cohort of 25 students who were registered at the Rumah Tahfidz Pelita Hati Klaten School. Non-test data was procured by means of observation, particularly by utilizing student collaboration skills sheets.

Study organization.

This research employed a Classroom Action Research (CAR) approach, specifically adhering to the Kemmis and McTaggart paradigm outlined by (Kemmis et al., 2019). The Participatory Action Research (PTK) method comprises four primary stages: planning, implementation, observation, and reflection based on collaboration skill indicators derived from previous studies Ahwan et al. (2023) and Robbins et al. (2019). The following metrics correspond with the collaborative skills theory, encompassing the proficiency to: 1) effectively collaborate in teams; 2) exhibit respect towards concepts, suggestions, and input from colleagues; 3) display exceptional perspective-taking skills; 4) comply with assigned roles or tasks; and 5) collectively assume responsibility for task outcomes.

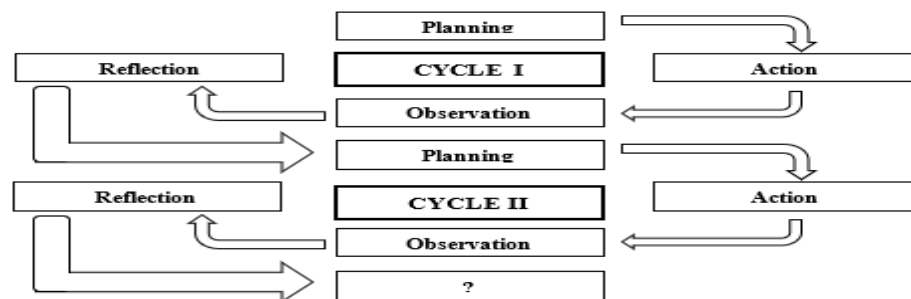


Figure 1. Classroom Action Research Design

Statistical analysis.

The method of quantitative description was utilized to analyze the data in each cycle with the assistance of Microsoft Excel 2019. The choice of this method was based on its ability to provide a comprehensive and accurate analysis of the data. The use of Microsoft Excel 2019 allowed for the efficient management of the data, ensuring that the analysis was conducted in a systematic and organized manner. The resulting analysis was reliable and concise, offering valuable insights into the research subject.

Results

The outcomes derived from conducting classroom action research, with a particular focus on improving student collaboration skills, reveal a notable lack of proficiency among students in working collectively with their peers. To obtain these outcomes, an initial phase of the research comprised administering a performance test aimed at gauging the level of collaboration skills.

Table 1. Distribution of Students Who Achieved KKM

Cycle	Frequency	Percentage (%)
Pre-Cycle	5	20%
Cycle I	9	36%
Cycle II	23	92%

The tabulated data presented in Table 1 above depicts the level of competency attained by students during the pre-cycle, cycle I, and cycle II. As per the report, only 20% of students met the minimum competency requirements (kkm) in the pre-cycle, while this number surged to 36% in cycle I. In the subsequent cycle, cycle II, an impressive number of 92% of students met the minimum competency requirements. These results indicate that the academic progress of the students has been commendable.

Table 2. Differences in Collaboration Results of Learners Using PBL

Criteria	Pre-Cycle	Cycle I	Cycle II	Description.
Completed	5-(20%)	9-(36%)	23-(92 %)	Improvement
Not Completed	20-(80 %)	16-(64%)	2-(8%)	

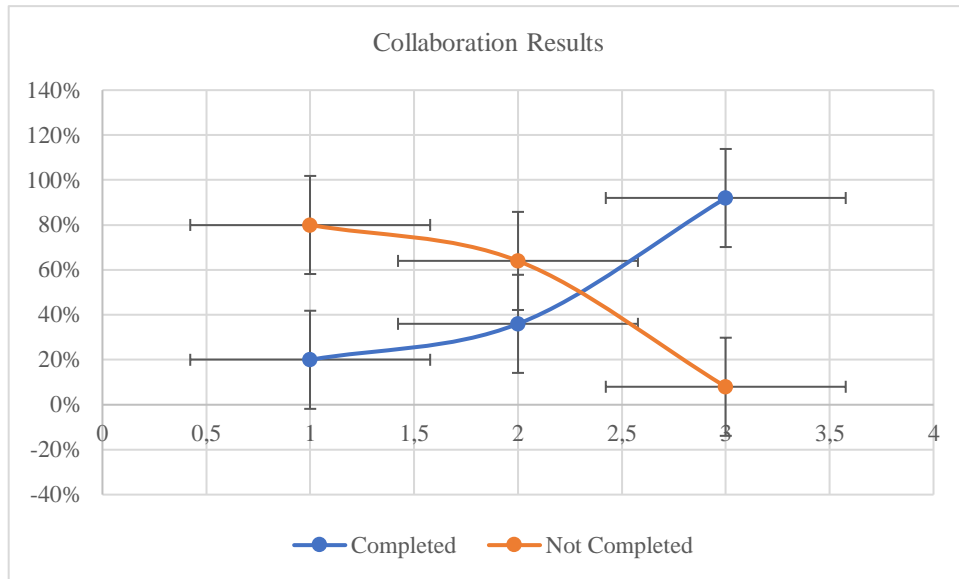


Figure 2. Collaboration Results between cycles

Discussion

The purpose of this study is to evaluate the impact of the problem-based learning methodology on students' collaborative skills during physical education classes. The results suggest that implementing a problem-based learning approach for two cycles is beneficial, as demonstrated by a significant improvement in collaboration skills observed between cycle I and cycle II. This progress is manifested in the students' positive feedback regarding the quality of their working relationships, the ease of group work, and the opportunities for both action and critical thinking, as discussed by (Harland, 2002). The positive impact is achieved by incorporating real-life tasks and providing sufficient time for students to address problems and undertake projects, aligning with the insights of (Saldo & Walag, 2020).

The findings of this study align with various prior research, such as Nurhayati et al., (2019) In this study, it was demonstrated that the use of problem-based learning instructional materials can improve students' communication and teamwork skills. What sets this study apart from others is its focus on evaluating problem-based learning teaching materials with the direct application of the learning model and its integration into the lesson plan. This is consistent with earlier research emphasizing the significance of incorporating constructive feedback (Mauri, Ginesta, & Rochera, 2016), to enhance student learning and engagement. Tseng et al., (2008) contribute to this understanding by asserting that the problem-based learning technique transforms the classroom into an interactive learning environment, moving teaching practices away from traditional methods to a more contemporary and engaging atmosphere.

Prior studies have also indicated challenges in applying problem-based learning models in higher education settings (Jamkar et al., 2007; Khaki et al., 2007; Nair, Shah, Seth, Pandit,

& Shah, 2013). The integration of both problem-based learning and case-based learning methods in facilitating student discussions demonstrated effectiveness in improving conversations related to public health (Ginzburg et al., 2019). Other research utilized problem-based learning and case-based learning strategies to cultivate students' leadership qualities without the need for additional curriculum or learning time (Ginzburg et al., 2018). Additionally, Hu et al., (2019) Integrated problem-based learning with flipped classrooms for improved performance but increased student effort in a peritonism course.

The teacher plays a crucial role in promoting active student engagement and collaboration throughout the learning process (Harianto, Gustian, Supriatna, Shalaby, & Taiar, 2023; Lynch, Kamovich, Longva, & Steinert, 2021). Consequently, a teacher is considered successful in education and the application of learning if positive changes in student behavior occur (Bachtiar, Putri, & Maulana, 2021; Rahayu, 2020). Learning approaches play a crucial role in student progress (Hardinata et al., 2023; Nasution, 2017), and the selection of an appropriate approach significantly influences the achievement of learning objectives (Suryadi, 2022b). It is crucial to enhance the capacity of instructors to utilize effective learning models in order to improve the quality of physical education, sports, and health education (Trimantara, 2021). However, a drawback of the problem-based strategy is its time-consuming nature, necessitating educators' time-management skills to ensure smooth and effective learning activities (Choden & Kijkuakul, 2020).

Conclusions

The present study demonstrates that the implementation of a problem-based learning (PBL) model has a favorable impact on enhancing 21st-century collaborative skills in the realm of physical education. The findings suggest that PBL is an effective approach to **instilling** the collaborative skills that are indispensable in meeting the demands of the contemporary world. By emphasizing the PBL method, this research provides insightful evidence **of** the potential contribution of this model in advancing the skills required for success in the current era, particularly in the context of physical education. These conclusions encourage further exploration and application of this educational model as a promising strategy to enhance students' collaborative skills in the contemporary milieu.

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Conflict of interest

The data presented in this research is free of any conflict of interest with any involved party. It is to be noted that in the event of any such discovery at a later stage, the author will bear full responsibility for the matter.

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