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The Impacts of the Project-Based Learning and Problem-Based Learning Models with Self-Confidence on Students' Learning Outcomes

RAHMITA SAFITRI[1*], ALNEDRAL[2], GUSRIL[3], ASEP SUJANA WAHYURI[4], AND YOVHANDRA OCKTA[5]

Abstract

This research explored the impact of Project-Based Learning (PjBL), Problem-Based Learning (PBL), and Self-Confidence on the learning outcomes of short-distance running of athletics in Sports Education. It emphasized that quality learning depends on effective design, adequate facilities, and teacher creativity. The research method involved a quasi-experimental design, testing the influence of PjBL, PBL, and self-confidence on student learning outcomes. The results indicated significant differences in learning achievements based on the applied models. The PjBL and PBL models individually impacted on learning outcomes, with students exhibiting higher engagement and understanding. However, the combination of all three factors did not show a significant influence on learning outcomes. In conclusion, the research suggests that adopting innovative learning models, such as PjBL and PBL, along with fostering students' self-confidence, can enhance the learning experience in sports education.

Keywords
Learning outcomes, project-based learning (PjBL), problem-based learning (PBL), self-confidence

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[1*] Universitas Negeri Padang, Sumatera Barat Indonesia, Corresponding author: rahmitasafitri@gmail.com
[2,3,4,5] Universitas Negeri Padang, Sumatera Barat, Indonesia

Introduction

Education is a crucial element in human life, which enables them to develop in line with developments in science and technology and face changing times. Therefore, handling educational problems in quality and quantity must be taken seriously. Quality education will be the foundation for future development by optimizing the potential of each student, who has talents that can be developed to contribute to society.

Education continues to experience significant developments and changes, changing the mindset of educators from the lay and monotonous. An educator must have quality education to achieve the goals and hopes of the nation's student development (Baro'ah, 2020). The role of the teacher is paramount in providing good learning (Buchari, 2018). Learning is the interaction between teachers and students through various learning methods and media (Febrita & Ulfah, 2019). Teachers not only transfer knowledge but also help form the character of students with good manners and morals (Mashuri & Fanani, 2021). Teacher motivation plays an essential role in determining the quality of learning, especially in creating students who are enthusiastic about learning. Students who are passionate about learning are reflected in success and achievement of targets learning. Quality learning depends on good design, facilities adequate, and teacher creativity inappropriately presenting the material. Learning models such as Project-Based Learning (PjBL) and Problem-Based Learning (PBL) help create interactive and exciting learning for students (Insyasiska et al., 2015). The 2013 curriculum is one of the curricula currently implemented. The teacher acts as a facilitator in the learning process to support students in achieving the competency standards set in the curriculum. Therefore, the 2013 curriculum must be followed by a comprehensive, continuous, and thorough assessment, which covers various aspects of knowledge, attitudes, and skills by the determined core competencies.

In learning Physical Education, Sports, and Health/ Sports Education, students are less enthusiastic and find it difficult to understand the benefits. Model inappropriate learning and lack of support in explaining the material are the causes. Teachers must use appropriate tools, such as Project-Based Learning (PjBL) and Problem-Based Learning (PBL), to make Sports Education learning more interesting and effective. Confidence students are paramount. Students, especially female students, have obstacles in carrying out physical activities due to a lack of self-confidence (Mulya & Agustryani, 2020). Self-confidence is the belief in one's ability to overcome challenges and achieve goals (Amri, 2018). Confidence can be developed through a supportive family environment and the role of teachers in helping students feel confident (Oktariani, 2018). In learning Sports Education, students need to be allowed to interact, appear in front, and receive positive feedback from teachers and friends. Learning models supporting social interaction and self-development can help improve students' self-confidence (Hamzah et al., 2020).

Learning models such as Project-Based Learning (PjBL) can help students feel more self-confident through group interaction, research, and problem-solving (Alawiyah & Sopandi, 2016). By giving students responsibility in organizing learning and addressing real challenges, this model can help develop students' self-confidence and abilities (Bulkini & Nurachadijat, 2023). Teachers need to play an active role in developing self-confidence in students through appropriate learning models, such as Project-Based Learning (PjBL). The Project-Based

Learning (PjBL) model can help students feel more confident through group interaction, product or performance development, and problem-solving (Elisabet et al., 2019). It will help students feel more motivated and active in learning Sports Education. The success of this model depends on the teacher's role in designing interesting learning that supports social interaction and self-development of students. With the right approach, Sports Education learning can be more meaningful and effective for student development. SMP Negeri 23 Pekanbaru has a major problem is the lack of self-students' confidence in participating in learning Sports Education.

One of the characteristics of students' lack of self-confidence is their shyness to ask questions. When learning, students who do not understand or do not master the material taught by educators tend to be reluctant to ask questions. The silent or busy attitude of students can cause a lack of understanding of the material being presented. This lack of self-confidence can harm students' learning achievement at school (Safitri et al., 2023). Student self-confidence is paramount in the learning process because students must be able and confident in their ability to solve problems in learning. This problem, researchers are interested in conducting deeper research on this problem to see the impact of three factors, namely the Project-Based Learning model, the Problem-Based Learning (PBL) model, and the level of self-confidence, regarding learning achievement in the discipline of short-distance running of athletics among students in SMP Negeri 23 Pekanbaru.

Literature Review

Project-based learning

The Project-Based Learning (PjBL) learning model is a comprehensive learning approach where students are involved in investigative activities cooperatively and continuously. In this model, students take an active role in conducting investigations individually and in groups, which helps them develop research skills relevant to their academic development. They design, solve problems, make decisions, and carry out investigations through the projects they work on. Project-Based Learning (PjBL) focuses on solving several problems that can motivate students and encourage them to face concepts and principles of knowledge directly through direct experience or direct practice. The Problem-Based Learning (PjBL) model is a learning approach based on constructivism, which involves student participation in learning and contextual problem-solving. Students learn to formulate problems, gather information, and develop scientific concepts. They learn to build problem frames, collect, and organize data, analyze information, and construct arguments regarding problem solutions individually and in groups.

The Project-Based Learning (PjBL) model has received attention in the education world because this approach combines learning with real experience. Project-Based Learning (PjBL) involves students actively in project activities and allows them to develop a deep understanding of definite conditions concepts (Nuraini & Waluyo, 2021). Therefore, the students not only accept information from teachers, but also have an essential role in designing, implementing, and evaluating their learning projects. In this Project-Based Learning (PjBL) model, participants and Students get the task of investigating complex problems or questions. They

need to conduct in-depth research, analyze data, find creative solutions, and produce a product or presentation that reflects understanding. This process does not only focus on academic aspects but also involves the development of 21st century skills such as collaborating, communicating, and thinking critically and creatively (Redhana, 2019). One of the main advantages of Project-Based Learning (PjBL) is that students learn in a meaningful and relevant way (Hartono & Asiyah, 2018). They experience concepts and principles in real-world contexts, which makes learning more lasting. The role of the teacher is changing from a "source of knowledge" to a "learning facilitator". Teachers support students by providing guides, offering suggestions, and stimulating reflection. Students learn how to overcome obstacles and turn failures into opportunities for further learning. Therefore, the Project-Based Learning (PjBL) model creates a classroom atmosphere that is more inclusive and collaborative and supports exploration.

According to Pan (2021), Project-Based Learning is a learning model that is student-centered and provides meaningful learning experiences for students. Students' learning experiences and concepts are built based on products produced in the Project-Based Learning process. The Project-Based Learning model has the following characteristics:

- Students play a role in decision-making and designing the framework.
- There is a problem to be solved that has not been determined previously.
- Students design processes to achieve results.
- Students are responsible for the collection and management of information.
- Students carry out evaluations on an ongoing basis.
- Students regularly reflect on their work progress.
- The final product is the result of the project and is evaluated for its quality.
- The classroom provides an atmosphere that accepts mistakes and changes.

The principle of Project-Based Learning is a complex effort that involves problem analysis that is planned, managed, and completed within a predetermined time limit. The Project-Based Learning process involves planning, implementation, and evaluation. This model enables problem identification, confrontation with new information, and personal knowledge discovery.

Project-Based Learning has several advantages, including increasing student motivation, as they feel actively involved in the project and find learning more enjoyable than other methods. increasing problem-solving abilities by enabling students to confront and solve complex problems. Increases collaboration, as projects often involve group work and communication between students. Improving resource management skills because students learn to manage time and resources to complete projects, encouraging the development of student communication skills, providing learning experiences that are relevant to the real world, and finally, creating a pleasant learning atmosphere for students and teachers. However, Project-based learning also has several disadvantages: a) requiring sufficient time to complete the project and produce a product, b) requiring significant costs, c) requiring teachers who are skilled and ready to be involved in the learning process, d) requiring facilities, equipment, and adequate materials, e) not suitable for students who tend to give up or do not have the necessary knowledge and skills, f) it is difficult to involve all students in group work.

Problem-based learning

Problem-based learning is a learning model designed so that students gain essential knowledge that makes them proficient in solving problems and have the skills to participate in teams. Problem-based learning was developed to help students develop thinking abilities, problem-solving, and intellectual skills. The learning that students need to solve problems can be accommodated with the Problem-Based Learning (PBL) model. Problem-Based Learning (PBL) has a learning scheme, namely meeting the problem, problem analysis and learning issues, discovery and reporting, solution presentation and reflection, overview, integration, and evaluation (Pranoto & Santosa, 2014). The main aim of the Problem-Based Learning model is to develop critical thinking skills and problem-solving abilities, as well as develop students' ability to actively build their knowledge. Problem-Based Learning is also intended to develop students' learning independence and social skills. Independent learning and social skills can be formed when students collaborate to identify relevant information, strategies, and learning resources to solve problems (Hmelo-Silver, 2004).

Problem-Based Learning (PBL) is another model that also has a positive impact on learning. Learning begins by giving students a challenging problem (Maryati, 2018). Students must then work together to analyze the problem information, identify the knowledge required, and formulate a rational solution (Syawaly & Hayun, 2020). This model allows students to develop critical thinking, working in groups, and solving skills in real problems (Nurkhasanah et al., 2019). Problem-Based Learning (PBL) has clear stages, such as problem identification, investigation, analysis, hypothesis formulation, and development solution. Problem-Based Learning (PBL) also supports the development of communication skills because participants Students must articulate their ideas and explain their approach to other people (Iryanto, 2021). Problem-Based Learning (PBL) has prominent characteristics in its conceptualization and application in the classroom. The following are several characteristics of Problem-Based Learning (PBL) that can be identified:

- Problems become the starting point in the learning process.
- The problems chosen are real and complex, unstructured.
- Problems often require multiple points of view.
- Problems challenge students' knowledge, attitudes, and skills, encouraging the identification of new learning needs.
- Organizing learning pays attention to students' self-direction.
- Diverse sources of knowledge, their use, and evaluation are essential in the learning process.
- Learning is collaborative, communicative, and cooperative.
- Developing inquiry and problem-solving skills is as essential as understanding knowledge concepts.
- The learning process involves the synthesis and integration of information.
- Evaluation and reflection on students' experiences and learning processes are an integral part of Problem-Based Learning (Bigelow, 2004).

The advantages of problem-based learning are: problem-solving stimulates students' abilities and provides satisfaction when they discover and develop new knowledge, problem-solving

develops students' critical and innovative thinking abilities and increases their intrinsic motivation to learn and adapt to new knowledge, problem-solving provides opportunities for students to apply knowledge in real-world contexts, problem-solving encourages students to learn throughout life, problem-solving shows students that learning depends not only on the presence of a teacher but also on intrinsic motivation themselves. Meanwhile, the disadvantages of Problem-Based Learning (PBL) are a) if students are not interested or think the problem to be investigated is too difficult, they may be reluctant to try it, and b) require sufficient preparation time. If teachers do not prepare these strategies well, learning objectives may not be achieved, c) Students' understanding of real-world problems is often lacking, which can hinder the problem-based learning process. In the context of a lack of PBL, inadequate preparation by teachers can be an obstacle to achieving learning goals.

Self-confidence

Apart from the learning model, self-confidence plays an essential role in learning. Self-confidence can be interpreted as calm behavior because there is no doubt about one's abilities or knowledge. It means having confidence in yourself to achieve something you have set out to do. The main shaper of student self-confidence in learning is student interaction with the teacher and fellow students (Preston, 2007). Self-confidence is belief in one's ability to achieve goals. It includes a sense of confidence in the individual's skills for achievement and greater success will increase self-confidence. Self-confidence can also bring feelings of security, comfort, calm, courage, and assertiveness. It is a positive attitude that allows individuals to evaluate themselves positively, both in their context and in the faced situation.

Self-confidence is paramount for everyone in developing their activities and creativity to achieve achievements. However, self-confidence does not develop spontaneously. It grows through social interactions that happen continuously in the individual's environment. Self-confidence includes belief in one's satisfactory abilities of one's awareness potential and ability to utilize it appropriately. It is the basic capital for developing self-identity. With self-confidence, a person can recognize and understand themselves. Therefore, self-confidence is a belief in an individual's ability to achieve goals. According to Neil et al. (2016), self-confidence is the extent to which someone believes in their abilities and feels worthy of achieving success. Self-confidence can be interpreted as an attitude that allows individuals to have a positive and realistic view of themselves and their surrounding situations. Self-confidence can also be interpreted as an individual's confidence to act on their dreams and desires. It is a positive attitude that allows individuals to develop positive self-esteem for themselves, others, and the environment around them. Self-confidence is an internal factor that influences the extent to which participants students feel capable and comfortable in facing learning challenges (Masruroh et al., 2019). With confidence, students are more likely to overcome obstacles, try different strategies differently, and develop a deeper understanding. Environment-supportive learning from teachers and classmates can play a role in building students' self-confidence (Achdiyat & Lestari, 2016). Students with self-confidence tend to be more active in exercising, trying new things, and participating more enthusiastically (Nurzaman, 2017). Therefore, teachers have a role in creating a positive and supportive environment development of students' self-confidence. In short-distance running athletics,

good technique is a determinant of success. Squat start, body position, footsteps, and landing are essential aspects that sprinters must master (Ulum, 2013).

Increasing self-confidence can provide strength that strengthens courage, which in turn will strengthen self-confidence itself. There are several methods for designing and developing self-confidence, such as believing in your abilities, believing in future success, associating with individuals with high levels of self-confidence, and understanding that desires can be overcome with self-confidence.

Self-confidence encourages a person to see others with clean and honest views. It creates a positive impression on others. Courage to face certain activities is also part of self-confidence. One way to overcome low self-esteem is to increase self-confidence. Here are some ways to increase self-confidence:

a) Improve appearance. A person's appearance can affect his or her level of self-confidence. Improving appearance can increase self-confidence.
b) Act. Learning to perform actions that are useful in an individual's life can increase self-confidence.
c) Taking decisions. Self-confidence is needed to make decisions. Learning to make decisions is part of training in self-confidence.
d) Enjoying activities. Enjoying what one does shows that the individual has done something well. It can increase self-confidence.
e) Recognizing strengths and talents. Recognizing one's strengths and talents can increase self-confidence.
f) Be calm. Maintaining a calm and reasonable *attitude* can increase self-confidence.
g) Dare to try. Trying something without fear of failure is the key to increasing self-confidence.
h) Learning and increasing insight: Increasing knowledge and insight can help individuals become more confident in dealing with definite problems and situations.

By implementing these methods, individual self-confidence can grow and develop naturally. In research that tests the influence of the Project-Based Learning (PjBL), Problem-Based Learning (PBL), and self-confidence in short-distance running of athletics learning can be expected the results will provide insight into how learning methods and self-confidence can influence student learning outcomes. With an understanding in more depth of these influences, educators can develop strategies that are more effective in improving athletics learning outcomes in sports education.

Learning outcomes

Determination of standards of success between educational institutions can vary, and currently, educational institutions have the autonomy to set minimum completion criteria (KKM) independently. In addition, the factors that influence learning outcomes do not only depend on improving the ability of educators but are also determined by other factors that interact with each other. Additionally, Hamalik (2004) stated several factors of difficulty in student learning outcomes, including internal, environmental, family, and community factors.

Learning outcomes include the abilities that students have after they experience the learning process. Some experts have different views about the types of learning outcomes.

According to Harefa et al. (2023), learning outcomes are divided into three main categories: (1) skills and habits, (2) knowledge and understanding, and (3) attitudes and aspirations. On the other hand, Gagne groups learning outcomes into five different categories, namely: (1) verbal information, (2) intellectual skills, (3) cognitive strategies, (4) attitudes, and (5) motor skills.

Methodology

This research used a quasi-experimental design with group experiments and controls to test the influence of Project-Based Learning (PjBL), Problem-Based Learning (PBL), and learning models on confidence in student learning outcomes in sports education subjects. According to Sugiyono (2017), experimental research methods are methods used to seek to influence the definite treatment of others under controlled conditions. Furthermore, the population was students of SMP Negeri 23 Pekanbaru for the 2022/2023 academic year with a sample of 40 students from class VII.1 to VII.8. The techniques used to collect data in this research include observation, which refers to direct observation of research objects to obtain an in-depth understanding of the activities being carried out. This method was applied to directly observe the situation in class VII of SMP Negeri 23 Pekanbaru, Test, and the last Documentation, used to document the research process taking place at SMP Negeri 23 Pekanbaru. In addition, hypothesis testing is carried out to identify the impact of learning models and self-confidence on student learning outcomes. The research results provide insight into the impact of various learning methods and the level of self-confidence regarding Sports Education learning outcomes.

Table 1. *Treatment design by level 2 x 2*

Athletics learning outcomes (A) *Self-confidence* (B)	*Project-Based Learning* (A_1)	*Problem-Based Learning* (A_2)
High (B_1)	A_1B_1	A_2B_1
Low (B_2)	A_1B_2	A_2B_2

Results and Discussions

Differences in short-distance running of athletics learning outcomes produced by the (Project-Based Learning) PjBL and (Problem-Based Learning (PBL) model, which was related to the level of self-confidence of students. The research design used two-way ANOVA with a 2x2 matrix.

Table 2. *Description of student ability data*

Class	N	MIN	MAX	MEAN	SD
A1B1	20	140	180	161,75	12,117
A1B2	20	134	164	149,3	11,889
A2B1	20	140	180	162,2	11,418
A2B2	20	140	164	153,6	29,371

Based on the table of research results, the mean value of class A1B1 is 161.75 with a min value of 140 and a max of 180, class A1B2 mean value of 149.3 with a min value of 134 and max of 164, class A2B1 means value 162, 2 with min value 140 and max 164, class A2B2 mean value 153.6 with min value 140 and max 164.

Normality test

In this research, data normality testing was carried out on four groups of data, which involved variations in the treatment of learning methods and levels of self-confidence in learning outcomes for short distance running of athletics. Testing was carried out with a real level of $\alpha = 0.05$. The results of normality calculations are in the table below:

Table 3. *Normality test results*

Class	df	Statistics	Sig
A1B1	20	0,875	0,114
A1B2	20	0,955	0,454
A2B1	20	0,886	0,152
A2B2	20	0,941	0,250

The results of the variable normality test were carried out using the Shapiro-Wilk test. It indicated that this research had a normal distribution.

Homogeneity test

Homogeneity assessment with the criterion that the null hypothesis (H0) was accepted if Sig value. > 0.05, indicated that the variance was homogeneous. Conversely, H0 was rejected if the Sig value is. < 0.05, indicated that the variance was not homogeneous. The calculation results and the results of the variance significance test for each group are in the table below.

Table 4. *Homogeneity results using Levene's test*

Levene Statistics	df1	df2	Sig.
17.908	7	152	0.000

Based on the table above, H0 Sig. 0.000 < 0.05, which means homogeneous variance with significance $\alpha = 0.05$. Thus, it showed that the fourth data group was not homogeneous.

Hypothesis testing

Through the between-subject effect test at a significance level of 5%, results showed the Sig value. of 0.000, which was smaller than the threshold value significance of 0.05. These results indicated significant differences in the learning outcomes of students' short distance running of athletics based on the model applied learning. Additionally, the Sig value was obtained at 0,000, which was also smaller than the value of 0.05, indicating a significant difference in students' short distance running of athletics learning outcomes based on confidence level (self-confidence). However, the value of Sig. 0.000, which was smaller than 0.05, indicated a significant interaction between the learning model and inner self-confidence influencing students' short distance running of athletics learning outcomes.

Table 5. *Tukey test calculation results*

Group	Mean Difference	SD. Error	Sig
A1B1 dengan A2B1	-.725[a]	6.417	.910
A1B2 dengan A2B2	.725[b]	6.417	.910

Based on the results of the output data in the table above, with a significance value (sig.) of 0.910, which is greater than the significance limit value of 0.05, it can be concluded that there was no significant difference between the learning outcomes for short distance running athletics students using the (project-based learning) pjbl and the problem-based learning (pbl) model.

Discussion

This research was designed to evaluate athletic learning outcomes for distance running for students by applying three learning models, namely project-based learning (pjbl), problem-based learning (pbl), and involving the variable of self-confidence, with the data analysis using the two-way ANOVA method and continued with Tukey's test.

The influence of the project-based learning (pjbl) model on distance running athletic learning outcomes short on sports education subjects

The research results revealed that the PjBL learning model had an influential and significant impact on learning achievement in short distance running athletics in Sports Education subjects. This finding was strengthened by the Sig. value of 0.000 showing that the positive influence of the project-based learning (PjBL) model on learning achievement in short-distance running of athletics in Sports Education subjects was significant. The results of this research were in line with Safitri's (2023) study, which stated that there was an influence of the project-based learning (PjBL) model on the learning outcomes of students confirmed by the results of hypothesis testing with a sig value of 0.000. Apart from this research, Fadliah and Hambali's (2023) study showed the influence of the project-based learning (PjBL) model

on student learning outcomes. Empirical support for the PjBL has been proven to make students experience meaningful learning through the constructivist approach. This application prioritizes active learning, where students are involved in activities that involve real action, in contrast to the passive approach, where the teacher only flows information. This learning model encourages interaction for sharing ideas and problem-solving and focuses on individual learning and collaboration. By improving skills and abilities in solving problems together, the Project-Based Learning (PjBL) model can provide an understanding of the concept better.

The effect of project-based learning (PBL) on learning outcomes in short-distance running of athletics on the Sports Education lessons

The research results indicate that the PBL Learning Model has a significant influence on learning achievement in short distance running of athletics in the Sports Education lessons. This result is strengthened by the Sig result value. of 0.000, which shows that the positive impact of the problem-based learning (PBL) model on learning achievement in short-distance running of athletics in the Sports Education subject was significant. Additionally, Irawan and Prastiwi (2020); and Hamzah et al. (2023), also stated that there is an influence of the Problem-Based Learning (PBL) Model on student learning outcomes. The problem-based learning (PBL) model results in the delivery of more learning materials generally guided by teachers to students, and it is different from models of conventional learning. Although students are expected to be active in searching for information from other sources, the teacher's role in delivering material remains essential.

The influence of self-confidence on short distance running athletic learning outcomes in sports education subjects

The results investigated the influence of three factors, namely the project-based learning (PjBL) model, the problem-based learning (PBL) model and the level of self-confidence in the learning outcomes of short-distance running athletics showed that students' learning achievements are at Sports Education subjects, either using the project-based learning (PjBL) model or problem-based learning (PBL) model. The results of data calculations showed that the Sig value = 0.910 at a significance level of 5%. During the learning process, the researchers' observations of students indicated variations in the level of student involvement, which showed a high dedication and focus on following the process of teaching and learning. They paired up according to the teacher's instructions for group formation and responsibly contributed actively to the work group. This learning model attracts students' interest because it provides opportunities to actively participate in learning.

The influence of PjBL, PBL, and self-confidence learning models on short distance running athletic learning outcomes in sports education subjects

Project-based learning (PjBL) and problem-based learning (PBL) models and self-confidence significantly influence short-distance running athletic learning outcomes for

students, with a value of Sig. less than 0.005. However, a combination of all three does not have a significant influence on learning outcomes.

Conclusions

This research aimed to investigate the impact of Project-Based Learning (PjBL) and Problem-Based Learning (PBL) models, along with the level of self-confidence, on short-distance running athletic learning outcomes in the context of Sports Education. The findings demonstrated that both PjBL and PBL models individually significantly influenced students' learning achievements. Additionally, self-confidence played a crucial role in enhancing students' performance. However, when considering the combined effect of all three factors, the interaction did not yield a significant influence on learning outcomes. These results highlight the importance of adopting innovative learning models and fostering self-confidence in Sports Education to optimize students' achievements in short-distance running athletics. Further research could explore additional variables and refine strategies to enhance the effectiveness of the combined impact of these factors on overall learning outcomes. In addition, the impact of PjBL and PBL on learning outcomes in both the PjBL and PBL learning models has a significant influence on learning achievement in short distance running athletics. The Sig values of 0.000 for both models suggest a substantial positive impact on learning outcomes. Significance of individual models: the PjBL and PBL models significantly impact learning outcomes. However, when combined with self-confidence, the interaction between these factors does not yield a significant influence on learning outcomes. It suggests that while each factor plays a role independently, their combined effect may not be as pronounced in this context.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest.

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Biographical Notes

RAHMITA SAFITRI is a student at Universitas Negeri Padang, Sumatera Barat, Indonesia; Corresponding e-mail: rahmitasafitri@gmail.com

ALNEDRAL is a lecturer at Universitas Negeri Padang, Sumatera Barat, Indonesia

GUSRIL is a lecturer at Universitas Negeri Padang, Sumatera Barat, Indonesia

ASEP SUJANA WAHYURI is a lecturer at Universitas Negeri Padang, Sumatera Barat, Indonesia

YOVHANDRA OCKTA is a student at Universitas Negeri Padang, Sumatera Barat, Indonesia