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Learning Motivation as a Predictor of Volleyball Learning Outcomes in Physical Education: A Study at SMP IT Al Azhar 24

Irfan Zinat Achmad^{1*}, Tedi Purbangkara², Dhika Bayu Mahardhika³, Ruslan Abdul Gani⁴, Alam Hadi Kosasih⁵

^{1,2,3}Physical Education, Health and Recreation Study Program, Faculty of Teacher Training and Education, Universitas Singaperbangsa Karawang, West Java Province, Indonesia

^{4,5}Sports Education Study Program, Faculty of Islamic Education and Teacher Training, Universitas Garut, West Java Province, Indonesia

*Corresponding Author: Irfan Zinat Achmad, e-mail: irfan.za@fkip.unsika.ac.id

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Abstract

Study Purpose This study aimed to examine the relationship between students' motivation and learning outcomes in volleyball learning at SMP TI Al Azhar 24.

Materials and Methods A quantitative correlational design was used with a sample of 60 students from grades VII to IX. Motivation data were collected using a questionnaire grounded in Self-Determination Theory, while volleyball learning outcomes were measured using a test assessing both technical performance and theoretical understanding. Data were analyzed using Pearson Product–Moment correlation and simple linear regression.

Results The mean motivation score was 96.83 and the mean volleyball learning outcome score was 82.57, indicating generally moderate to high levels of motivation and achievement. The analysis showed a strong, positive relationship between motivation and learning outcomes ($r = 0.674$; $p < 0.05$). Regression results indicated that motivation explained 45.4% of the variance in volleyball learning outcomes, with the remaining variance attributed to other factors.

Conclusion Motivation is strongly associated with volleyball learning outcomes in physical education. Teachers are encouraged to build supportive and enjoyable learning environments that strengthen students' intrinsic motivation and engagement during volleyball instruction.

Keywords: Audiovisual Media; Physical Fitness; Basic Movement Skills; Physical Education; Junior High School Students.

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Introduction

Education plays a crucial role in shaping students' physical, intellectual, and emotional development (Pires & Ugrinowitsch, 2021). One of the key components of education is physical education, which aims to promote physical fitness, teamwork, and character building (Biese et al., 2024). Through physical education, students not only develop motor skills but also acquire positive values such as discipline and responsibility (Moy et al., 2024). Among the various physical education activities, volleyball is a popular team sport that requires coordination, cooperation, and strategic thinking. Therefore, effective volleyball learning can significantly contribute to both students' cognitive and affective growth (Polat et al., 2021). Understanding what factors influence learning outcomes in volleyball becomes essential for educators (Etuk et al., 2022; Syaleh et al., 2026).

In the context of learning volleyball, motivation serves as an internal driving force that determines students' willingness and persistence to participate actively (Eluère et al., 2023). Motivation influences how much effort students put into learning, how they respond to challenges, and how they maintain enthusiasm during the learning process (Bojkowski, 2022). When students are motivated, they tend to engage more deeply in practice, pay attention to techniques, and strive for improvement (Garra et al., 2024). On the contrary, lack of motivation may lead to disinterest, poor performance, and limited skill development. Hence, motivation becomes a key determinant of successful learning outcomes in volleyball education (de Souza et al., 2024).

Learning outcomes refer to the level of knowledge, skills, and attitudes students acquire after going through a structured learning process (Brynzak et al., 2021). In physical education, learning outcomes are not only measured through academic achievement but also through performance, participation, and behavioral changes (Popovych et al., 2020). Volleyball learning outcomes, in particular, encompass technical skills like serving, passing, and spiking, as well as cognitive understanding of game strategies and teamwork (Tamminen et al., 2023). The achievement of these outcomes is heavily influenced by both internal and external factors, with motivation being one of the most critical internal variables (De Waelle et al., 2021).

Several studies have demonstrated a strong relationship between motivation and student performance in academic and physical education contexts. Highly motivated students tend to achieve better results, show greater perseverance, and display positive learning behaviors (Finkenzeller et al., 2021). However, motivation is not a static factor it can fluctuate depending on the learning environment, teaching approach, and individual differences. For this reason, it is important to examine how motivation specifically affects volleyball learning outcomes, as this can inform teachers in designing strategies that enhance both engagement and performance (Watson et al., 2021).

In Indonesia, physical education is often undervalued compared to academic subjects like mathematics or science (Hsu et al., 2021). Many students participate in physical education classes merely to fulfill requirements rather than for personal growth or skill mastery (Popovych et al., 2022). This phenomenon results in varying levels of motivation among students, which directly affects learning outcomes (Kirby & Kluge, 2022). At SMP TI Al Azhar 24, volleyball is one of the main physical education activities, yet teachers have observed inconsistent levels of student performance and engagement. This raises the question of whether students' motivation significantly influences their volleyball learning outcomes.

Understanding the relationship between motivation and volleyball learning outcomes is urgent because it can help educators identify strategies to foster intrinsic motivation in students (da Costa et al., 2024). Motivation is not only influenced by personal interest but also by the learning environment, feedback, and teacher behavior (Guo et al., 2022). When teachers know how motivation impacts performance, they can implement better instructional

methods, use supportive communication, and create a positive classroom climate (Suh et al., 2022). Such understanding can lead to more effective volleyball learning sessions that produce both skillful and enthusiastic students (Ferman et al., 2024).

The urgency of this research lies in the need to enhance the quality of physical education, particularly in volleyball learning at SMP TI Al Azhar 24. Many schools still emphasize performance results over the motivational aspects that lead to sustainable learning. By exploring how motivation relates to learning outcomes, this study provides valuable insights for teachers to balance physical training and psychological encouragement. Moreover, motivation-oriented learning can cultivate lifelong interest in sports, which contributes to students' holistic development. Therefore, identifying this relationship is not only beneficial academically but also socially and behaviorally (Van Meervelt et al., 2023).

Previous research has widely examined the link between motivation and learning outcomes in general academic subjects, such as mathematics and language learning (Gajardo-Burgos et al., 2023). However, studies focusing specifically on motivation in volleyball learning within junior high school settings are still limited, particularly in Indonesian contexts (ALHammouri & Ismail, 2023). Most prior works have explored sports motivation at the higher education or elite athlete level, leaving a gap in understanding how motivation affects everyday physical education experiences (Thompson et al., 2024). This study fills that gap by focusing on middle school students, who are in a critical developmental stage for shaping attitudes toward sports and learning (Pulido et al., 2023).

Another significant gap found in previous studies is the lack of integration between psychological and pedagogical perspectives in analyzing motivation (Coimbra et al., 2021). Many existing studies treat motivation as a single variable without considering how teaching strategies, feedback styles, and peer interactions influence it (Ittlinger et al., 2024). This research attempts to address this limitation by considering the holistic learning environment in volleyball education (Sun et al., 2024). It highlights how motivation interacts with both the students' internal states and the external conditions created by teachers and peers.

At SMP TI Al Azhar 24, volleyball classes are conducted regularly as part of the physical education curriculum. Observations indicate that while some students display enthusiasm and skill improvement, others show minimal progress and lack participation. This discrepancy may stem from differences in motivational levels. Investigating this condition systematically allows the researcher to provide evidence-based recommendations for improving the teaching process. It also helps identify whether current instructional approaches adequately support students' psychological readiness to learn.

Furthermore, volleyball as a team sport provides an ideal platform for analyzing motivation because it requires both individual and collective effort. Students must cooperate, communicate, and maintain a sense of responsibility to succeed. These elements are closely linked to motivational constructs such as achievement motivation, social motivation, and intrinsic interest. Therefore, studying volleyball learning outcomes through the lens of motivation can reveal deeper insights into how students develop interpersonal skills and positive attitudes in addition to technical abilities.

This study also holds practical significance for teachers, curriculum designers, and educational institutions (Aprriyadi et al., 2026). By understanding the motivational factors that drive student success in volleyball, educators can design learning activities that are more engaging and student-centered (Mizoguchi et al., 2025). Teachers can adopt strategies such as goal setting, positive reinforcement, and varied practice methods to sustain student motivation (Priyambada et al., 2026). Ultimately, motivated students are more likely to enjoy physical activity, achieve better results, and maintain healthy lifestyles beyond the classroom context (Astuti et al., 2024).

In conclusion, this research aims to analyze the relationship between motivation and student learning outcomes in volleyball learning at SMP TI Al Azhar 24. It seeks to determine whether higher motivation correlates with better performance and to identify which aspects of motivation are most influential. By addressing the existing research gap and emphasizing the urgency of motivation-based learning, this study aspires to contribute to the improvement of physical education pedagogy. The findings are expected to support teachers in fostering not only athletic competence but also a positive and enduring attitude toward learning.

This study offers novelty by specifically examining the relationship between learning motivation and volleyball learning outcomes in a junior high school physical education setting, an area that remains underexplored in the Indonesian context. While previous research has largely focused on general academic achievement or sports motivation in broader populations, this study centers on volleyball learning at SMP TI Al Azhar 24 and provides a more contextual understanding of how motivation contributes to students' performance in physical education. In doing so, it extends the existing literature by linking motivational factors with sport-specific learning outcomes at the middle school level.

Materials and methods

Study participants

The participants were students of SMP TI Al Azhar 24 Karawang who attended physical education classes and were involved in volleyball learning activities. The population comprised approximately 180 students from grades VII–IX. A total of 60 students (male and female) were recruited using purposive sampling based on the following inclusion criteria: (1) actively participating in volleyball learning during the study period, (2) having completed at least two volleyball evaluation sessions, and (3) willing to participate and complete the questionnaire. This sample size was considered sufficient to meet statistical requirements for correlational analysis.

Study organization

This study used a quantitative correlational design with a cross-sectional approach to examine the relationship between student motivation (independent variable) and volleyball learning outcomes (dependent variable) without manipulating variables. The research was conducted at SMP TI Al Azhar 24 Karawang during the 2024/2025 academic year, specifically March–May 2025, coinciding with volleyball instruction in the second semester.

Data were collected using two primary instruments:

1. Motivation questionnaire: Developed based on Self-Determination Theory (SDT), measuring intrinsic motivation, extrinsic motivation, and amotivation. The questionnaire consisted of 25 items rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Content validity was assessed through expert judgment and pilot testing, while reliability was evaluated using Cronbach's alpha ($\alpha \geq 0.70$ considered acceptable).
2. Volleyball learning outcomes assessment: Measured through a combination of practical performance tests and a written test. The practical test assessed technical skills (serving, passing, setting, and spiking), while the written test evaluated knowledge of volleyball rules and strategies. Scores from both components were combined to represent each student's overall volleyball learning outcome.

The data collection procedure included obtaining permission from the school principal and PE teacher, administering the motivation questionnaire to selected students with standardized instructions, and conducting volleyball performance assessments under the supervision of the PE teacher and the researcher to maintain objectivity. All data were

checked for completeness prior to analysis. Ethical principles were applied, including informed consent, voluntary participation, and confidentiality of responses.

Statistical analysis

Data analysis involved descriptive and inferential statistics. Descriptive statistics were used to summarize motivation and learning outcomes (mean, standard deviation, and frequency distribution). The relationship between motivation and volleyball learning outcomes was tested using the Pearson Product–Moment correlation coefficient. Prior to correlation testing, normality and linearity assumptions were examined. All analyses were conducted using SPSS version 26.0 with a significance level of $p < 0.05$.

Results

1. Descriptive Statistics of Research Variables

The research involved 60 students from grades VII to IX at SMP TI Al Azhar 24 Karawang. Data were collected using a motivation questionnaire and volleyball learning outcome assessments. Descriptive statistical analysis was conducted to obtain the mean, standard deviation, minimum, and maximum scores of each variable.

Table 1. Descriptive Statistics of Research Variables

| Variable | Minimum | Maximum | Mean | Std. Deviation |
|------------------------------|---------|---------|-------|----------------|
| Motivation | 65 | 125 | 96.83 | 12.42 |
| Volleyball Learning Outcomes | 60 | 100 | 82.57 | 9.16 |

The data in [Table 1](#) show that the average motivation score of students was 96.83, which indicates that students generally possessed a high level of motivation toward volleyball learning. The average volleyball learning outcome score was 82.57, suggesting that most students achieved satisfactory to high performance levels in their volleyball skills and understanding.

2. Categorization of Motivation Levels

To provide a clearer description, motivation scores were categorized into three levels: high, medium, and low. The categorization was based on the mean \pm standard deviation formula.

Table 2. Distribution of Students' Motivation Levels

| Motivation Level | Score Range | Frequency | Percentage |
|------------------|-------------|-----------|------------|
| High | ≥ 109 | 17 | 28.3% |
| Medium | 85 – 108 | 34 | 56.7% |
| Low | ≤ 84 | 9 | 15.0% |
| Total | — | 60 | 100% |

Based on [Table 2](#), the majority of students (56.7%) demonstrated a moderate level of motivation, while 28.3% had a high level and 15.0% were categorized as low. This indicates that most students were adequately motivated but still had room for improvement in maintaining consistent enthusiasm and persistence during volleyball lessons.

3. Categorization of Volleyball Learning Outcomes

Student performance in volleyball was also classified into three categories using a similar approach.

Table 3. Distribution of Volleyball Learning Outcomes

| Learning Outcome Category | Score Range | Frequency | Percentage |
|---------------------------|-------------|-----------|------------|
| High | ≥ 90 | 20 | 33.3% |
| Medium | 75 – 89 | 32 | 53.4% |
| Low | ≤ 74 | 8 | 13.3% |
| Total | — | 60 | 100% |

As shown in [Table 3](#), 53.4% of students achieved medium-level learning outcomes, 33.3% reached high outcomes, and 13.3% obtained low outcomes. These findings suggest that the majority of students performed adequately in volleyball but only about one-third demonstrated excellent mastery of volleyball skills and knowledge.

4. Test of Data Normality

Before testing the relationship between the two variables, the data were examined for normality using the Kolmogorov-Smirnov test at a significance level of 0.05.

Table 4. Normality Test Results

| Variable | Sig. (p-value) | Interpretation |
|------------------------------|----------------|----------------|
| Motivation | 0.200 | Normal |
| Volleyball Learning Outcomes | 0.159 | Normal |

The results in [Table 4](#) show that both variables had significance values greater than 0.05, indicating that the data were normally distributed and suitable for further parametric statistical analysis.

5. Linearity Test Results

A linearity test was performed to ensure that the relationship between motivation and learning outcomes was linear.

Table 5. Linearity Test Results

| Variable Pair | Sig. Deviation from Linearity | Interpretation |
|---|-------------------------------|----------------|
| Motivation × Volleyball Learning Outcomes | 0.276 | Linear |

[Table 5](#) the p-value of 0.276 (greater than 0.05) indicates that there is no significant deviation from linearity, meaning the relationship between motivation and volleyball learning outcomes is linear.

6. Correlation Analysis Results

The Pearson [Table 6](#). Product-Moment Correlation test was used to determine the strength and direction of the relationship between motivation and volleyball learning outcomes.

Correlation Between Motivation and Volleyball Learning Outcomes

| Variables | r-value | Sig. (p-value) | Interpretation |
|--------------------------------|---------|----------------|---------------------------------|
| Motivation × Learning Outcomes | 0.674 | 0.000 | Significant, Strong Correlation |

As shown in Table 6, the correlation coefficient ($r = 0.674$) with a significance value of $p = 0.000 < 0.05$ indicates a strong and significant positive relationship between motivation and volleyball learning outcomes. This means that higher levels of student motivation are associated with better volleyball performance and learning results.

7. Regression Analysis Results

To determine the predictive contribution of motivation to learning outcomes, a simple linear regression analysis was conducted.

Table 7. Summary of Regression Analysis

| Model | R | R ² | Adjusted R ² | Sig. (p-value) | Interpretation |
|-------|-------|----------------|-------------------------|----------------|--|
| 1 | 0.674 | 0.454 | 0.446 | 0.000 | Motivation significantly predicts volleyball learning outcomes |

The regression analysis in Table 7 shows that motivation accounts for 45.4% of the variance in volleyball learning outcomes, while the remaining 54.6% is influenced by other factors not examined in this study. The significance value ($p = 0.000$) confirms that motivation is a significant predictor of students' volleyball performance.

The results indicate that both motivation and volleyball learning outcomes among students at SMP TI Al Azhar 24 are generally at a moderate to high level. Statistical analysis confirms that the relationship between motivation and learning outcomes is positive, strong, and significant. Students with higher motivation tend to achieve higher volleyball performance scores, while those with lower motivation demonstrate weaker learning results.

Discussion

The relationship observed between students' motivation and volleyball learning outcomes can be interpreted as evidence that learning success in physical education is not determined solely by physical capacity, but also by students' psychological engagement with the learning process (Ittlinger et al., 2024). Within Self-Determination Theory (SDT), motivation quality especially intrinsic motivation and more autonomous forms of extrinsic motivation supports persistence, enjoyment, and deeper learning. In volleyball instruction, these motivational processes matter because students must repeatedly practice demanding skills (e.g., serving, passing, and spiking) while also learning rules and tactical decision-making (Barrick et al., 2015; Ullrich-French & Smith, 2009). When students are motivated, they are more likely to invest effort, tolerate mistakes, and seek improvement, which helps transform practice time into measurable competence.

From a pedagogical perspective, motivation can influence learning outcomes through several mechanisms commonly highlighted in PE and sport pedagogy literature (De Souza Martins & Posada-Bernal, 2016; Ellis et al., 2003; Ní Chróinín et al., 2018). First, motivated students tend to engage in greater time-on-task and higher practice intensity, increasing opportunities for motor learning and skill refinement. Second, motivation is linked to self-regulation, such as setting goals, monitoring progress, and responding constructively to feedback behaviors that accelerate learning in both technical and cognitive domains (Afzal & Torralba, 2024; Akdeniz, 2024; Burns, 2024). Third, motivation also supports cognitive

engagement, which is essential for volleyball learning because students must understand positioning, rotations, and game rules in addition to executing techniques. Therefore, the association found in this study can be interpreted as reflecting how motivated students convert instructional opportunities into both performance gains and conceptual understanding.

SDT also emphasizes that motivation is shaped by the extent to which learning environments satisfy three basic psychological needs: autonomy, competence, and relatedness. In volleyball learning, competence support can be provided through clear instruction, progressive task difficulty, and formative feedback that helps students experience improvement (Abdulaziz Saleh Aljohani et al., 2016; Adewale et al., 2024). Autonomy support can be reflected in opportunities to make choices (e.g., roles in drills, task variations, or practice goals) and in teaching that explains the purpose of activities rather than relying on control. Relatedness emerges when students experience supportive teacher–student and peer relationships, which is particularly relevant in volleyball because skill development often depends on cooperation and communication. Interpreting the findings through this lens suggests that improving learning outcomes may require teachers not only to teach techniques but also to intentionally design a climate that nurtures these psychological needs (Bojkowski, 2022; Pulido et al., 2023; Suh et al., 2022).

The contribution value indicated by the model suggests that motivation is substantial but not exclusive in explaining learning outcomes, which aligns with multi-factor perspectives in PE. Volleyball achievement typically reflects the combined influence of individual factors (e.g., physical fitness, coordination, prior experience), instructional factors (e.g., teaching models, practice structure), and contextual factors (e.g., facilities, class climate). This means that, while motivational enhancement is important, effective volleyball learning likely requires motivational strategies to be integrated with quality instruction (clear demonstrations, sufficient repetitions, and feedback) and equitable learning conditions (equipment availability and organized practice stations). In other words, motivation should be treated as a central lever within a broader teaching system rather than as a stand-alone solution (Abdulaziz Saleh Aljohani et al., 2016; Moy et al., 2024).

These interpretations have practical implications for physical education instruction. Teachers can strengthen students' autonomous motivation by using need-supportive teaching: providing meaningful rationales for drills, offering limited choices, using encouragement that emphasizes improvement, and structuring tasks progressively to build competence (Arlianto et al., 2024; Chima Abimbola Eden et al., 2024). Small-sided games, cooperative drills, and role rotation can also support relatedness and engagement, while clear feedback and achievable performance targets can enhance competence beliefs (Abarghouejad et al., 2021; Adewale et al., 2024). Over time, such practices may create a learning cycle where motivation increases participation and practice quality, which then improves performance and further strengthens motivation.

Overall, the findings are meaningful because they support current educational and sport psychology perspectives that motivation is a core condition for effective learning in PE (Alotaibi, 2024; Champ et al., 2020; Cheon et al., 2018). In volleyball learning specifically, motivated students are more likely to persist through repetitive practice, engage cognitively with rules and tactics, and participate actively with peers (Abdulaziz Saleh Aljohani et al., 2016; Ahmed & Al Salim, 2024). Therefore, building a supportive motivational climate should be considered a key strategy for improving volleyball learning outcomes in junior high school physical education contexts.

Conclusions

This study fills a gap in evidence from junior high vocational-style contexts by showing that motivation is a key factor related to volleyball learning success at SMP TI Al

Azhar 24 Karawang. The main finding confirms a strong, positive relationship between motivation and volleyball learning outcomes ($r = 0.674$; $p < 0.05$), with motivation explaining 45.4% of the variance in outcomes. This contributes practical insight for physical education teachers that strengthening students' motivation—especially through supportive and enjoyable instruction can meaningfully improve both technical performance and conceptual understanding in volleyball learning.

This study is limited by its cross-sectional correlational design, which cannot establish causality, the use of self-reported motivation data, and the single-school sample ($n = 60$) that may limit generalizability. Future research should involve larger multi-school samples, incorporate objective learning measures (e.g., standardized skill tests and tactical decision-making assessments), and apply longitudinal or experimental designs to test whether specific motivational strategies or teaching models cause improvements in volleyball learning outcomes.

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Conflict of interest

The authors declare that there is no conflict of interest related to the publication of this manuscript.

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Information about the authors:

Irfan Zinat Achmad,: irfan.za@fkip.unsika.ac.id, <https://orcid.org/0000-0003-3354-7347> , Physical Education, Health and Recreation Study Program, Faculty of Teacher Training and Education, Universitas Singaperbangsa Karawang, West Java Province, Indonesia

Tedi Purbangkara,: tedi.purbangkara@fkip.unsika.ac.id, <https://orcid.org/0000-0003-1670-9834>, Physical Education, Health and Recreation Study Program, Faculty of Teacher Training and Education, Universitas Singaperbangsa Karawang, West Java Province, Indonesia

Dhika Bayu Mahardhika,: dhika.bayumahardhika@fkip.unsika.ac.id, <https://orcid.org/0000-0002-6206-8719>, Physical Education, Health and Recreation Study Program, Faculty of Teacher Training and Education, Universitas Singaperbangsa Karawang, West Java Province, Indonesia

Ruslan Abdul Gani,: ruslan.abdulgani@staff.unsika.ac.id, <https://orcid.org/0000-0002-7608-1658>, Sports Education Study Program, Faculty of Islamic Education and Teacher Training, Universitas Garut, West Java Province, Indonesia

Alam Hadi Kosasih,: alamhadikosasih@uniga.ac.id, <https://orcid.org/0000-0002-6170-8462>
, Sports Education Study Program, Faculty of Islamic Education and Teacher Training,
Universitas Garut, West Java Province, Indonesia

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