

## **Learning Motivation and Basketball Learning Outcomes: An Analysis of Their Relationship in Physical Education**

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### **Abstract**

*Learning motivation is an important aspect of the learning process in Physical Education, including basketball instruction. However, learning motivation does not always correspond directly to learning outcomes, as achievement may be influenced by various factors. This study aimed to analyze the relationship between learning motivation and basketball learning outcomes in Physical Education. A quantitative approach with a correlational research design was employed. The participants consisted of 36 tenth-grade students involved in basketball learning activities. Learning motivation data were obtained through observation and documentation, while learning outcomes were derived from students' basketball learning scores. The data were analyzed descriptively to examine the characteristics of each variable, followed by Pearson correlation*

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*analysis to determine the relationship between learning motivation and learning outcomes. The results showed that the students' mean learning motivation score was 76.94%, while the mean basketball learning outcome was 80.11. Pearson correlation analysis yielded a correlation coefficient of 0.165 with a significance value of 0.337 ( $p > 0.05$ ), indicating a very weak and statistically non-significant positive relationship between learning motivation and basketball learning outcomes. These findings suggest that relatively favorable levels of learning motivation do not sufficiently explain variations in students' basketball learning outcomes. Therefore, basketball learning achievement may be associated with other factors beyond learning motivation that should be considered in Physical Education instruction.*

**Keywords: Learning Motivation; Learning Outcomes; Basketball; Physical Education; Correlation.**

## **INTRODUCTION**

Physical Learning motivation is an important psychological component in the learning process because it relates to students' willingness to initiate, maintain, and direct their behavior toward learning goals. In Physical Education (PE), motivation has particular relevance because learning requires students to engage directly in physical activities, practice movement skills, respond to instructional situations, and maintain effort throughout the learning process. Motivation can therefore be reflected through students' participation, persistence, attention, effort, and willingness to engage in learning activities.

Self-Determination Theory (SDT) provides an important framework for understanding motivation in PE. The theory proposes that the quality of students' motivation is associated with the satisfaction of three basic psychological needs: autonomy, competence, and relatedness (White et al., 2021; Wang & Chen, 2022). When students perceive that they have meaningful opportunities to participate, feel capable of completing learning tasks, and experience positive relationships within the learning environment, their motivational experiences may become more supportive of active engagement. This perspective is relevant to PE because students frequently encounter movement tasks that require repeated attempts and immediate responses to success and failure.

Motivation in PE is also related to how students perceive the value and attainability of learning tasks. Expectancy-value perspectives emphasize that students' expectations regarding their ability to succeed and the value they assign to an activity are associated with effort and



engagement (Shang et al., 2023). Consequently, students who perceive a PE activity as valuable and believe that they can successfully perform the required task may be more willing to participate and persist during practice. However, motivation should not be interpreted as a direct or exclusive determinant of learning achievement because learning outcomes can also depend on physical, technical, instructional, and contextual characteristics.

The learning environment constitutes another important dimension of students' motivational experiences. A supportive motivational climate may facilitate intrinsic motivation and adaptive achievement goals in PE (Pons et al., 2023). Similarly, instructional organization and learning design can shape students' perceptions of learning activities and their subsequent engagement (Hu et al., 2022; Yip et al., 2023). Research concerning variety-support has also indicated that providing varied learning experiences may be associated with students' engagement through motivational processes (Miao et al., 2024). In addition, perceived instructional support and satisfaction of psychological needs have been associated with students' motivation and engagement in PE (Pan & Hsu, 2024). These findings reinforce the view that motivation is embedded within an instructional environment rather than existing independently of classroom experiences.

Another relevant concept is situational interest. Situational interest concerns students' immediate psychological response to particular learning activities or situations and may contribute to their engagement in physical activity. In PE, learning tasks that attract students' attention and provide meaningful experiences may support greater involvement in the learning process (Hudo & Perlman, 2024). This perspective is particularly relevant to skill-based activities such as basketball, where students encounter different movement tasks, challenges, and opportunities for practice.

Basketball is a skill-oriented activity that requires the integration of physical, cognitive, and psychomotor competencies. Students are expected to understand rules and movement concepts while simultaneously demonstrating skills such as passing, dribbling, shooting, and coordinated movement. Learning therefore involves repeated practice and the application of movement skills in increasingly complex situations. The characteristics of basketball learning distinguish it from learning outcomes that depend predominantly on written or conceptual assessments. Successful performance may require sufficient practice opportunities, physical readiness, coordination, technical proficiency, and the ability to respond to task demands. Motivation may support students' willingness to practice and participate, but these other characteristics may also contribute to differences in learning achievement. Consequently, a relationship between



motivation and basketball learning outcomes should be examined empirically rather than assumed theoretically.

Basketball can also provide a context for integrating motivational and educational experiences. Wienecke et al. (2021), for example, examined a basketball-related educational context in which physical education was connected with learning experiences beyond physical performance. Although such research does not establish that motivation directly determines basketball skill achievement, it demonstrates the potential of basketball-based learning environments to involve psychological and educational processes simultaneously.

Learning outcomes in PE generally encompass multiple domains, including knowledge, attitudes, participation, and movement competencies. In practical sport learning, the psychomotor component becomes particularly important because students must demonstrate the ability to perform movement techniques. Ekasaputra and Prasetyo (2024) highlighted the relevance of considering multiple student characteristics when examining PE learning outcomes by examining learning motivation together with physical fitness and intellectual intelligence. This supports the argument that learning achievement in PE should not be interpreted through a single psychological variable. Similarly, Fierro-Suero et al. (2023) examined motivation and emotions in PE and highlighted the relevance of psychological processes in students' learning experiences.

Previous empirical studies have generally reported positive relationships between learning motivation and PE learning outcomes, although the magnitude of the relationship has differed across populations and learning contexts. Makorohim et al. (2023) reported a significant positive relationship between learning motivation and PE learning outcomes among tenth-grade students, with a correlation coefficient of 0.528. This finding suggests a moderate association between the two variables within that particular educational context. A weaker relationship was reported by Sipayung et al. (2024), who found a significant correlation of  $r = 0.287$  between learning motivation and PE learning outcomes among junior high school students. The study reported that motivation accounted for approximately 8.2% of the variance in learning outcomes. The difference in magnitude between these findings illustrates that the association between motivation and achievement may vary across educational levels and learning conditions.

More recent studies have continued to report positive associations. Fadlan et al. (2026) reported a moderate positive relationship between learning motivation and PE learning outcomes, with  $r = 0.430$ . Achmad et al. (2026) reported a stronger relationship between learning motivation and volleyball learning outcomes, with  $r = 0.674$ . Although these findings provide empirical support for an association between motivation and PE achievement, they should not be



interpreted as evidence that motivation alone determines learning outcomes. Differences in sport characteristics, educational level, sample characteristics, measurement instruments, and instructional environments may contribute to variation in observed relationships.

The broader literature also suggests that motivation operates alongside other psychological and behavioral processes. Fernández-Espínola et al. (2022) demonstrated that motivationally oriented interventions in physical activity contexts can produce positive outcomes, while the magnitude of those outcomes may differ according to intervention characteristics and contextual conditions. These findings support the need for a contextualized examination of motivation rather than treating it as a universally consistent explanation of achievement.

The existing literature provides a reasonable basis for expecting a positive association between learning motivation and PE learning outcomes. Nevertheless, several gaps remain. First, previous studies have frequently examined learning outcomes at the general PE subject level, whereas basketball-specific learning outcomes may involve distinctive psychomotor and technical demands. Second, previous studies have involved different educational levels, including elementary, junior high, and general secondary education, meaning that their findings may not necessarily represent vocational high school students. Third, differences in measurement procedures may affect the magnitude and interpretation of the observed relationship. Many studies have employed structured motivation questionnaires, whereas the present study uses observational motivation scores documented during classroom learning activities.

These differences create a need for empirical examination within a specific learning context. The present study focuses on tenth-grade vocational high school students participating in basketball learning in PE. Rather than testing an intervention or determining a causal effect, the study examines whether students' documented learning motivation is statistically associated with their basketball learning outcomes. Based on the theoretical perspectives and empirical findings reviewed above, the conceptual expectation of the study is that higher learning motivation may be associated with better basketball learning outcomes. However, because the present research employs a correlational design, this expectation is formulated as an association rather than a causal relationship.

Accordingly, the hypothesis proposed in this study is that there is a positive and statistically significant relationship between students' learning motivation and basketball learning outcomes in Physical Education. The null hypothesis states that there is no statistically significant relationship between students' learning motivation and basketball learning outcomes in Physical Education.



## **LITERATURE REVIEW**

Learning motivation is an important psychological component in the learning process because it relates to students' willingness to initiate, maintain, and direct their behavior toward learning goals. In Physical Education (PE), motivation has particular relevance because learning requires students to engage directly in physical activities, practice movement skills, respond to instructional situations, and maintain effort throughout the learning process. Motivation can therefore be reflected through students' participation, persistence, attention, effort, and willingness to engage in learning activities.

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The broader literature also suggests that motivation operates alongside other psychological and behavioral processes. Fernández-Espínola et al. (2022) demonstrated that motivationally oriented interventions in physical activity contexts can produce positive outcomes, while the magnitude of those outcomes may differ according to intervention characteristics and contextual conditions. These findings support the need for a contextualized examination of motivation rather than treating it as a universally consistent explanation of achievement.

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demands. Second, previous studies have involved different educational levels, including elementary, junior high, and general secondary education, meaning that their findings may not necessarily represent vocational high school students. Third, differences in measurement procedures may affect the magnitude and interpretation of the observed relationship. Many studies have employed structured motivation questionnaires, whereas the present study uses observational motivation scores documented during classroom learning activities.

These differences create a need for empirical examination within a specific learning context. The present study focuses on tenth-grade vocational high school students participating in basketball learning in PE. Rather than testing an intervention or determining a causal effect, the study examines whether students' documented learning motivation is statistically associated with their basketball learning outcomes. Based on the theoretical perspectives and empirical findings reviewed above, the conceptual expectation of the study is that higher learning motivation may be associated with better basketball learning outcomes. However, because the present research employs a correlational design, this expectation is formulated as an association rather than a causal relationship.

Accordingly, the hypothesis proposed in this study is that there is a positive and statistically significant relationship between students' learning motivation and basketball learning outcomes in Physical Education. The null hypothesis states that there is no statistically significant relationship between students' learning motivation and basketball learning outcomes in Physical Education.

## **RESEARCH METHOD**

This study employed a quantitative correlational design to examine the relationship between students' learning motivation and basketball learning outcomes in Physical Education (PE). The study was conducted through a quantitative re-analysis of documented classroom learning data from a previous classroom-based learning activity. The correlational design was selected because the purpose of the study was to determine the strength and statistical significance of the relationship between the two variables without manipulating either variable or establishing a causal relationship.

The participants were 36 tenth-grade students from class X-AKL 2 at a vocational high school in Semarang, Indonesia. All students in the class were included in the analysis using a total sampling approach because the available dataset contained paired scores for learning motivation and basketball learning outcomes for all 36 students. The unit of analysis was the individual



student. To maintain confidentiality, students' identities were not included in the analysis or reporting, and the findings were presented in aggregate form.

The dataset consisted of two variables: learning motivation and basketball learning outcomes. Learning motivation was represented by the percentage scores documented through classroom observation during the learning activities. The motivation scores reflected students' observed learning behavior during the PE learning process. Basketball learning outcomes were represented by students' numerical achievement scores obtained from the documented learning assessment. Each student therefore had one motivation score and one corresponding basketball learning outcome score, allowing the two variables to be analyzed at the individual level.

The available classroom documentation originally included observation, interview, and documentation procedures. However, because the present study specifically examined the statistical relationship between learning motivation and basketball learning outcomes, the quantitative re-analysis was restricted to the documented observation-based motivation scores and the corresponding basketball learning outcome scores that were available for all participants. Interview information was not converted into numerical data and was therefore not included in the statistical analysis.

Data analysis was conducted in several stages. First, descriptive statistics were calculated to determine the mean scores of learning motivation and basketball learning outcomes. Second, the normality of each variable was examined using the Shapiro–Wilk test. Third, because the distribution of basketball learning outcome scores did not meet the assumption of normality, the relationship between learning motivation and basketball learning outcomes was examined using Spearman's rank-order correlation. Spearman's correlation was selected because it does not require both variables to follow a normal distribution and is appropriate for assessing the strength and direction of a monotonic relationship between two variables. Statistical significance was evaluated at an alpha level of 0.05.

The analysis produced a learning motivation mean of 76.94% and a basketball learning outcome mean of 80.11. The Shapiro–Wilk test indicated that the learning motivation scores were normally distributed ( $W = 0.973$ ,  $p = 0.498$ ), whereas the basketball learning outcome scores were not normally distributed ( $W = 0.876$ ,  $p < 0.001$ ). Therefore, Spearman's rank-order correlation was used as the primary inferential analysis. The resulting correlation coefficient was interpreted in terms of its direction, magnitude, and statistical significance.

Because this study used a correlational design and analyzed previously documented classroom data, the statistical relationship was not interpreted as evidence of causality. In



particular, the analysis does not establish that learning motivation causes changes in basketball learning outcomes, nor does it determine the effectiveness of a particular teaching strategy. The findings are interpreted only in terms of whether variation in students' learning motivation was statistically associated with variation in their basketball learning outcomes within the studied group.

## RESULT AND DISCUSSION

The analysis was conducted to examine the relationship between students' learning motivation and basketball learning outcomes in Physical Education. The analysis involved 36 students from class X-AKL 2. Descriptive statistics were first calculated, followed by a normality test and Spearman's rank-order correlation analysis. The results are presented in Tables 1–3.

The descriptive statistics are presented in Table 1. The mean learning motivation score was 76.94%, with a standard deviation of 5.82 and a median of 77.00. The scores ranged from 65 to 88. Meanwhile, the mean basketball learning outcome score was 80.11, with a standard deviation of 6.41 and a median of 78.00. The scores ranged from 73 to 92.

**Table 1. Descriptive Statistics of Learning Motivation and Basketball Learning Outcomes**

| Variable                     | N  | Mean  | SD   | Median | Minimum | Maximum |
|------------------------------|----|-------|------|--------|---------|---------|
| Learning motivation (%)      | 36 | 76.94 | 5.82 | 77.00  | 65      | 88      |
| Basketball learning outcomes | 36 | 80.11 | 6.41 | 78.00  | 73      | 92      |

The descriptive results indicate that the students demonstrated variation in both learning motivation and basketball learning outcomes. The range of motivation scores was 23 points, while the range of learning outcome scores was 19 points. However, the difference between the mean scores should not be interpreted as evidence that motivation was related to learning outcomes. Descriptive statistics only describe the distribution and central tendency of each variable. Therefore, an inferential analysis was required to determine whether the two variables were statistically associated.

The normality test results are presented in Table 2. The Shapiro–Wilk test indicated that the learning motivation scores were normally distributed ( $W = 0.973$ ,  $p = 0.498$ ). In contrast, the basketball learning outcome scores did not meet the normality assumption ( $W = 0.876$ ,  $p < 0.001$ ). Because the outcome variable was not normally distributed, Spearman's rank-order correlation was selected for the subsequent analysis.



**Table 2. Normality Test**

| Variable                     | Shapiro–Wilk W | p-value | Interpretation           |
|------------------------------|----------------|---------|--------------------------|
| Learning motivation          | 0.973          | 0.498   | Normally distributed     |
| Basketball learning outcomes | 0.876          | <0.001  | Not normally distributed |

The results of the Spearman correlation analysis are presented in Table 3. The analysis produced a correlation coefficient of  $\rho = 0.204$  with a p-value of 0.233 ( $n = 36$ ). The positive coefficient indicates that the direction of the observed association was positive. In other words, students with higher learning motivation scores tended to have somewhat higher basketball learning outcome scores. Nevertheless, the magnitude of the association was weak, and the p-value exceeded the predetermined significance level of 0.05.

**Table 3. Spearman Correlation Between Learning Motivation and Basketball Learning Outcomes**

| Variables                                        | Spearman's $\rho$ | p-value | N  | Interpretation                       |
|--------------------------------------------------|-------------------|---------|----|--------------------------------------|
| Learning motivation Basketball learning outcomes | 0.204             | 0.233   | 36 | Very weak, positive, non-significant |

Based on Table 3, the null hypothesis was retained, while the hypothesis proposing a statistically significant positive relationship between learning motivation and basketball learning outcomes was not supported. The finding indicates that, within the present sample, variation in students' documented learning motivation was not statistically associated with variation in their basketball learning outcomes. Although the correlation coefficient was positive, its magnitude was small and the association was not statistically significant.

This finding differs from several previous studies that reported statistically significant positive relationships between learning motivation and PE learning outcomes. Makorohim et al. (2023) reported a correlation coefficient of 0.528 among tenth-grade students, indicating a moderate positive relationship. Sipayung et al. (2024) reported a weaker but statistically significant relationship ( $r = 0.287$ ), with motivation accounting for approximately 8.2% of the variance in learning outcomes. Fadlan et al. (2026) reported a moderate positive relationship ( $r = 0.430$ ), while Achmad et al. (2026) reported a stronger relationship between learning motivation and volleyball learning outcomes ( $r = 0.674$ ). Compared with these findings, the correlation observed in the present study ( $\rho = 0.204$ ) was weaker and did not reach statistical significance.



The difference does not necessarily indicate that the findings are inconsistent with the previous literature. The strength of the relationship between motivation and learning outcomes may vary according to the characteristics of the participants, educational level, learning material, measurement procedures, and instructional context. The present study specifically examined basketball learning outcomes among vocational high school students, whereas some previous studies examined learning outcomes at the broader PE subject level or investigated other sports. Therefore, the relationship identified in a general PE context cannot automatically be assumed to have the same magnitude in a specific basketball learning context.

The characteristics of basketball learning may provide an additional contextual consideration. Basketball is a skill-oriented activity requiring students to coordinate movements, perform technical skills, respond to task situations, and repeatedly practice specific movement patterns. Learning outcomes in such activities may therefore depend on more than students' willingness to participate or their observed motivation. Students may demonstrate high motivation while still requiring additional practice and technical development before achieving a particular level of movement performance. Conversely, students with relatively lower observed motivation may already possess previous experience or technical competence that enables them to obtain relatively high learning outcome scores. These possibilities, however, were not directly measured in the present study and therefore cannot be regarded as empirical explanations of the observed correlation.

The measurement of motivation is another factor that should be considered when comparing the present findings with previous studies. In this study, learning motivation was represented by documented observational scores obtained during classroom learning activities. Such scores primarily represent observable student behaviors during the learning process. In contrast, many previous studies have examined motivation using structured questionnaires designed to capture students' psychological perceptions, values, expectations, or motivational orientations. Differences in operational definitions and measurement instruments may consequently produce different patterns of association between motivation and learning outcomes.

From a theoretical perspective, the finding is consistent with the view that motivation is embedded within a broader learning process. Self-Determination Theory emphasizes that students' motivational experiences are related to autonomy, competence, and relatedness, while the learning environment may contribute to the satisfaction of these psychological needs (White et al., 2021; Wang & Chen, 2022). Research on motivational climate has likewise indicated that



instructional environments can contribute to students' achievement goals and intrinsic motivation (Pons et al., 2023). Other studies have emphasized the relevance of instructional organization, learning variety, perceived support, and engagement in understanding students' experiences in PE (Hu et al., 2022; Miao et al., 2024; Pan & Hsu, 2024; Yip et al., 2023). Consequently, an observed motivation score at a particular point in the learning process may not capture all psychological and instructional conditions that contribute to students' learning achievement.

Situational interest may also be relevant to the interpretation of motivation in PE. Students' immediate responses to particular activities can influence their engagement and participation, particularly when learning involves varied physical tasks and challenges (Hudo & Perlman, 2024). However, engagement during a learning activity does not necessarily translate directly into mastery of a particular motor skill. Basketball performance requires the integration of repeated practice, movement coordination, technical execution, and task-specific responses. Therefore, a weak association between observed motivation and learning outcomes is theoretically plausible within a skill-oriented learning context.

The present finding also has implications for the interpretation of motivation in PE instruction. The absence of a statistically significant relationship should not be interpreted to mean that motivation is unimportant. Motivation remains relevant to participation, persistence, and engagement in learning activities. However, the findings indicate that motivation alone should not be considered a sufficient explanation for differences in basketball learning outcomes. Previous research has similarly emphasized the importance of broader motivational and instructional processes in physical activity and PE contexts (Fernández-Espínola et al., 2022; Fierro-Suero et al., 2023). From a pedagogical perspective, attention to motivation may therefore be more appropriately combined with opportunities for structured practice, appropriate feedback, technical correction, progressive task difficulty, and development of movement competencies. These considerations are presented as pedagogical implications rather than tested effects because the present study did not experimentally examine any instructional intervention.

The finding can also be understood in relation to the broader literature concerning basketball and PE learning. Basketball-based learning activities provide opportunities for students to develop physical and educational competencies simultaneously, but the achievement of specific learning outcomes may involve multiple dimensions beyond motivation (Wienecke et al., 2021). Similarly, research examining PE learning outcomes has demonstrated the relevance of considering several student characteristics rather than relying on motivation as a single explanatory variable (Ekasaputra & Prasetyo, 2024). Thus, the weak correlation observed in this



study reinforces the importance of examining learning achievement from a multidimensional perspective.

Several limitations should be considered when interpreting the findings. First, the study involved only 36 students from a single vocational high school class. Therefore, the findings cannot be generalized directly to students from other schools, educational levels, or geographical contexts. Second, the motivation variable was based on documented classroom observations rather than a standardized validated motivation questionnaire. This limits direct comparability with studies using psychometric motivation instruments. Third, the analysis involved only learning motivation and basketball learning outcomes. Other potentially relevant variables, such as previous basketball experience, physical fitness, motor competence, practice frequency, technical proficiency, and instructional characteristics, were not measured. These variables therefore cannot be claimed as explanations for the present finding. Fourth, the correlational design does not permit causal conclusions.

Overall, the results provide a more nuanced understanding of the relationship between learning motivation and basketball learning outcomes. The students demonstrated a mean learning motivation score of 76.94% and a mean basketball learning outcome score of 80.11. The Spearman analysis revealed a weak positive relationship ( $p = 0.204$ ), but the relationship was not statistically significant ( $p = 0.233$ ). Thus, within the present sample, higher observed learning motivation was not accompanied by a statistically reliable difference in basketball learning outcomes. The result differs in magnitude from several previous studies that reported significant positive relationships, suggesting that the association between motivation and PE achievement may depend on the learning context, measurement approach, and characteristics of the learning outcome.

The present study consequently contributes evidence that challenges a simple assumption that students with higher learning motivation will necessarily achieve higher basketball learning outcomes. Rather than viewing motivation as a single determinant of achievement, future research should examine motivation together with physical, technical, psychological, and instructional factors. Larger samples involving multiple vocational schools, validated motivation instruments, and additional variables related to motor competence and learning conditions would provide a stronger basis for determining how motivation is associated with achievement in basketball and other skill-oriented PE activities.



## CONCLUSION

Based This study examined the relationship between students' learning motivation and basketball learning outcomes in Physical Education among 36 tenth-grade students. The descriptive results showed that students' learning motivation had a mean score of 76.94%, while the mean basketball learning outcome was 80.11. Spearman's rank-order correlation analysis indicated a weak positive relationship between learning motivation and basketball learning outcomes ( $p = 0.204$ ,  $p = 0.233$ ). However, the relationship was not statistically significant. Therefore, the hypothesis proposing a significant positive relationship between students' learning motivation and basketball learning outcomes was not supported.

These findings indicate that learning motivation alone may not sufficiently explain differences in students' basketball learning outcomes within the observed class. Basketball learning involves technical and motor competencies that may also be related to factors such as previous experience, physical and motor abilities, practice opportunities, technical proficiency, instructional characteristics, and the quality of feedback. These factors were not measured in the present study and therefore cannot be evaluated as determinants of the observed learning outcomes.

The findings contribute to Physical Education research by showing that the relationship between learning motivation and learning outcomes may vary according to learning context and the characteristics of the learning task. In practical terms, teachers should continue to foster students' motivation while also providing structured opportunities for repeated practice, appropriate technical feedback, progressive learning tasks, and opportunities to develop basketball-specific skills. However, these pedagogical implications should not be interpreted as evidence of causal effects because the present study employed a correlational design.

Future research should involve larger and more diverse samples across schools and educational levels, use validated instruments for measuring learning motivation, and include additional variables related to students' physical, motor, cognitive, and instructional characteristics. Longitudinal or intervention-based research may also provide stronger evidence regarding how motivational and instructional factors are associated with the development of basketball learning outcomes over time.

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