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Research on the Pathway for Enhancing the Learning Efficacy of Teenagers in Sports Based on Educational Psychology

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Abstract. The adolescent stage has a direct influence on long-term learning involvement and physical activity patterns, making it essential to enhance the effectiveness of physical education to influence future habits. To explore this issue, this study, from the perspective of educational psychology, focuses on how psychological mechanisms promote the learning performance of adolescents in the physical education environment. Through a literature review that integrates the relevant findings from 2021 to 2025, this paper explores the key approaches to enhancing the learning effectiveness of physical education and systematically examines them based on the self-determination theory and the social cognitive perspective. Specifically, this study focuses on self-efficacy, autonomous motivation, the satisfaction of basic psychological needs, and the perception of teacher autonomy support, analyzing how these psychological variables are related to learning engagement and learning outcomes, and exploring effective ways to improve learning effectiveness in school physical education. The results show that the improvement of students' learning effectiveness is mainly driven by three interrelated pathways: boosting self-efficacy, fulfilling basic psychological needs to foster autonomous learning motivation, and creating a supportive teaching environment for autonomy. This indicates that applying educational psychology principles to physical education can effectively increase adolescents' learning engagement and performance, and provide clear directions for subsequent research and practice.

Keywords: Physical education learning effectiveness, Educational psychology, Adolescents, Self-efficacy, Learning motivation

1. Introduction

Improving physical education outcomes is crucial during adolescence, a key period for developing lasting learning habits and engaging in physical activities. Existing studies indicate that students' learning outcomes rely on skills, content, and psychological factors like participation, motivation, and persistence. Therefore, educational psychology is widely used to explain the learning process in physical education, emphasizing psychological factors such as self-efficacy, motivation, basic needs satisfaction, and teacher support. Empirical studies also show that students with higher self-efficacy tend to exhibit greater participation and improved learning outcomes in physical education. Besides,

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factors like self-efficacy, motivation, fulfillment of basic needs, and teacher encouragement are increasingly emphasized. In addition, empirical studies show that students with higher self-efficacy tend to exhibit higher participation and deeper learning outcomes in physical education. Moreover, research based on the self-determination theory highlights the role of autonomy-supportive teaching and need-supportive learning environments in fostering students' intrinsic motivation and sustained participation. Yet, existing research remains fragmented and lacks a unified framework to integrate psychological pathways for improving learning outcomes in physical education. To address this gap, this study uses a literature review to analyze the latest empirical and theoretical studies published between 2021 and 2025. Through analysis and comparison of educational psychology and sports research, this study aims to identify key pathways for enhancing learning outcomes. Specifically, it focuses on the interpretation of educational psychology theories on learning outcomes in physical education, analyzes the links between key psychological factors like self-efficacy, motivation, basic needs satisfaction, and teacher support with learning engagement and outcomes, and investigates integrated approaches to improve school physical education. This research provides a reference for understanding the psychological mechanisms in adolescent physical education learning and may offer insights for sports teaching practice and subsequent research.

2. Theoretical foundation of sports learning efficacy among adolescents

The efficacy of adolescent physical education learning refers to students' learning engagement, skill acquisition and learning outcomes in physical activities.Its performance depends on athletic skills, fitness, psychological traits, motivation, and the teaching context [1,2]. Therefore, it is necessary to clearly define the core concept and sort out the relevant theoretical framework, and analyze its formation mechanism and influencing factors from the perspective of educational psychology.

2.1. The concept of sports learning efficacy in teenagers

Rooted in educational psychology, sports learning efficacy involves evaluating both the learning process and its outcomes. It is generally understood as the efficiency and effectiveness of learners achieving their learning goals in a specific learning context. In the context of sports learning, this concept encompasses not only the acquisition of motor skills but also learning engagement, learning experiences, and the stability and transferability of learning outcomes [3,4]. Compared to traditional evaluation methods centered on grades or physical fitness indicators, sports learning efficacy places greater emphasis on the psychological experiences and behaviors during the learning process. For adolescents, sports learning efficacy shows distinct developmental traits. As adolescents experience rapid physical and mental growth, their sports learning behaviors are shaped by cognitive levels, skill acquisition, and social factors like self-esteem, emotions, interests, and interactions with peers and teachers, resulting in notable differences in engagement, experiences, and outcomes. Moreover, school sports, as the main learning environment, not only focuses on the improvement of motor skills and physical fitness but also emphasizes the cultivation of students' positive learning attitudes, autonomous participation abilities, and the ability to transfer classroom behaviors to extracurricular sports activities continuously [1]. Therefore, defining sports learning efficacy from an educational psychology perspective helps to clarify evaluation indicators and understand its influencing factors.

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2.2. The manifestations of learning efficacy in adolescent sports

Existing research indicates that the efficacy of physical education learning among teenagers can be viewed via three dimensions: engagement, experience, and outcomes. Learning engagement reflects the degree of behavioral participation and effort, learning experience reflects emotions and feelings, while learning outcomes represent skill acquisition and lasting achievements. In the dimension of learning engagement, highly effective students exhibit strong participation, consistent effort, and persistence in tasks. Studies have found that students with higher self-efficacy levels are more likely to engage actively, practice consistently, and persist in their learning efforts over time in physical education classes [3,5]. In terms of learning experience, the physical education efficacy is closely linked to students' emotional responses and subjective feelings. Positive learning experiences, such as a sense of achievement, pleasure, and concentration, can enhance students' learning engagement and the willingness to continue participating. When the classroom provides autonomy support and timely positive feedback, students are more likely to form positive learning experiences and remain proactive during the learning process [6]. In the dimension of learning outcomes, the efficacy of physical education learning not only manifests in the improvement of skill levels or grades, but also reflects the stability and transferability of learning outcomes. For example, whether students can apply the sports skills and learning attitudes learned in class to extracurricular sports activities is an important indicator of learning efficacy [4]. This dimension highlights the overall learning process and outcomes, along with the influence of classroom behavior on long-term physical participation.

2.3. The factors affecting adolescents' sports learning efficacy

Current research generally holds that the sports learning efficacy of teenagers is formed through the interaction of individual psychological factors and teaching context factors. At the individual level, self-efficacy and learning motivation are seen as the key psychological variables influencing sports learning efficacy. Studies have shown that students with higher levels of self-efficacy are more likely to form positive ability cognition, thereby maintaining higher levels of learning engagement and persistence in sports learning [5,7]. Besides, research based on the Self-Determination Theory indicates that when students' basic psychological needs are met, their autonomous motivation levels significantly increase, thereby promoting the improvement of sports learning efficacy [2,8]. At the teaching context level, teacher support methods and classroom atmosphere influence sports learning efficacy. Studies show that autonomy-supportive teaching, positive teacher-student interactions, and supportive environments boost students' motivation and participation [6,9,10]. In contrast, overly controlling or merely emphasizing skill outcomes in teaching methods may weaken students' intrinsic motivation, limiting the exertion of sports learning efficacy. Therefore, the sports learning efficacy of teenagers is shaped by the interaction of multiple psychological and teaching context factors. In this regard, understanding the mechanism of efficacy improvement from an educational psychology perspective requires a systematic review of these influencing factors.

3. The educational psychology approach to boosting teenagers' sports learning efficacy

The enhancement of sports learning efficacy in teenagers results from a combination of factors, where psychological variables and teaching context elements interact via a psychological regulation mechanism [1,2]. Key mechanisms such as self-efficacy, learning motivation, basic psychological needs fulfillment, and teacher support are critical in influencing learning behavior and outcomes. In

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turn, these mechanisms boost sports learning efficacy by shaping students' participation, motivation, and persistence.

3.1. The role of self-efficacy and athletic learning efficacy

Self-efficacy refers to an individual's subjective judgment of their ability to complete a specific task. It is regarded as an important psychological mechanism that affects learning behavior and learning outcomes. In the context of physical education learning, self-efficacy directly influences students' confidence in learning tasks, their level of engagement, and their persistence, exerting a significant impact on learning efficacy. Research shows that students with higher levels of self-efficacy are more likely to actively participate in physical education learning and maintain stable efforts and continuous engagement when facing challenging tasks [3].

From the perspective of the mechanism, self-efficacy mainly influences sports learning efficacy through three pathways. Self-efficacy can boost students' expectations of successful sports learning, thus motivating them to invest more effort in the learning process. Additionally, it helps to increase learning persistence, reduces negative emotional reactions caused by setbacks. And self-efficacy can also improve students' self-regulation ability, promoting the stability and continuity of learning outcomes [5]. Further related research has found that self-efficacy plays a mediating role between teacher support and learning engagement, serving as an important psychological link connecting the teaching environment and learning efficacy [11].

3.2. The role of learning motivation and basic psychological needs

Based on the Self-Determination Theory, the quality of learning motivation is a stronger predictor of learning efficacy than the intensity of motivation. The Self-Determination Theory suggests that when learning situations can meet the basic psychological needs of individuals, such as autonomy, competence, and relatedness, students are more likely to form autonomous motivation and thus exhibit sustained and high-quality learning behaviors [1]. The satisfaction of these needs not only stimulates students' intrinsic interest but also enhances their perseverance and emotional regulation when facing challenging tasks.

Empirical studies have shown that learning motivation and basic psychological needs play a key mediating role in enhancing sports learning efficacy. The satisfaction of basic psychological needs can directly enhance students' learning motivation, while autonomous motivation further promotes students' sustained participation and deep engagement in sports learning, thereby improving overall learning efficacy [2,8]. Moreover, a mutually reinforcing relationship between learning motivation and self-efficacy has also been found. When students perceive their own abilities and the support of the learning situation, their motivation levels rise. Besides, high levels of autonomous motivation further boost self-efficacy, both contributing to the development of sports learning efficacy [9,12].

3.3. Teacher support, teaching environment, and psychological adjustment

Apart from individual psychological factors, the teaching environment is also an important external condition that affects the efficacy of teenagers' sports learning. From the perspective of educational psychology, the teaching environment does not directly determine the learning outcome; instead, it indirectly affects learning efficacy by regulating students' psychological states. The key situational factors include the teacher's support methods, classroom atmosphere, and teaching organization.

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Studies show that an autonomy-supportive teaching environment boosts students' self-efficacy and autonomous motivation. When teachers provide students with choices, give positive feedback, and pay attention to their emotional experiences in the sports classroom, students are more likely to form positive ability cognition and learning attitudes [6]. Besides, teacher support has been proven to have an indirect effect on sports learning participation and learning efficacy by influencing students' learning motivation and self-efficacy [9]. Moreover, studies based on the collaborative support of schools and families have found that a multi-support environment can further enhance the regulatory effect of psychological mechanisms, improving the overall level of sports learning efficacy [7,10]. Thus, self-efficacy, learning motivation, and basic psychological needs, as well as teacher support in the teaching environment, interact with each other to form the core educational psychology mechanism for enhancing the efficacy of teenagers' sports learning.

4. The construction of pathways for enhancing teenagers' sports learning efficacy

Based on educational psychology and related research, pathways to boost teenagers' sports learning efficacy are explored through individual psychological and teaching context factors. And this path emphasizes factors like self-efficacy, autonomous motivation, basic needs satisfaction, and teacher support, showing their impact on learning engagement, experience, and outcomes, which enhance sports learning efficacy [1,2].

4.1. Pathways to enhancing efficacy through individual psychological factors

From an individual perspective, self-efficacy and learning motivation are the core psychological foundations for enhancing the effectiveness of teenagers' sports learning. Existing studies have shown that students with higher self-efficacy are more likely to develop positive perceptions of their abilities, maintaining high engagement and perseverance in sports learning, which enhances overall learning effectiveness [3,5]. Thus, the path to enhancing self-efficacy via individual psychological factors should start with enhancing students' self-belief. On the specific path, by setting moderately challenging learning tasks, providing timely and positive feedback, and strengthening successful experiences, students' confidence in their sports abilities can be effectively boosted. At the same time, learning motivation, especially autonomous motivation, plays an important promoting role in this path. When students view sports learning as a process of self-choice and self-development, their learning behavior becomes more persistent and has an internal driving force [9]. Relevant research further indicates that there is a mutually reinforcing relationship between self-efficacy and learning motivation, with both working together as a key psychological pathway to enhance sports learning effectiveness [12].

4.2. Pathways to enhancing effectiveness through optimizing teaching scenarios

At the teaching context level, the organization of the teaching environment and the way teachers provide support are important factors influencing the efficacy of adolescents' physical education learning. Moreover, an autonomy-supportive teaching environment significantly enhances students' learning motivation and positive emotions, thus improving physical education learning efficacy [6]. When teachers respect the students' subjectivity, provide appropriate choices and pay attention to individual differences in teaching, students are more likely to form stable learning engagement and positive learning attitudes. Further analysis reveals that teacher support does not merely influence classroom participation through behavioral aspects, but rather indirectly affects learning efficacy by

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regulating students' psychological states. Relevant studies show that teacher support strengthens students' self-efficacy and intrinsic motivation, fostering greater participation in physical education and enhancing learning outcomes [12]. On this basis, some studies highlight the synergy of support from both school and family levels, which helps to establish a more stable and sustained learning environment that strengthens the effectiveness of optimizing the teaching context [7,10].

4.3. Pathways to enhancing effectiveness by integrating psychology and context

Enhancing adolescents' sports learning efficacy arises from the synergy of individual psychological factors and teaching context factors, rather than the independent influence of a single factor. Related studies have gradually reached a consensus that sports learning efficacy is strengthened through the continuous interaction between individual psychological resources and teaching context support. From the perspective of specific mechanisms, an autonomy-supportive teaching environment boosts classroom interactions and fosters self-efficacy and intrinsic motivation by meeting student' needs for autonomy and competence, thereby boosting learning engagement and experience [1,11]. In this process, teacher support and classroom environment create external conditions for psychological factors, while self-efficacy and learning motivation internally affect learning behaviors, collectively driving the consistent improvement of learning outcomes. Further empirical studies reveal that when supportive teaching contexts and higher levels of individual psychological resources coexist, the enhancement of sports learning efficacy is more significant and has better sustainability [4,8]. Thus, integrating individual psychological factors and teaching context factors clarifies the specific mechanisms for enhancing adolescents' sports learning efficacy.

5. Conclusion

This study integrates recent empirical and theoretical research from the perspective of educational psychology to explore the mechanisms for enhancing the effectiveness of youth sports learning. The results reveal that the effectiveness of sports learning is the outcome of the interaction between individual psychological factors and the teaching environment, rather than solely dependent on skill acquisition. In particular, self-efficacy directly influences learning engagement, perseverance, and outcomes, with more confident students showing greater classroom participation. Besides, learning motivation, especially autonomous motivation driven by meeting basic psychological needs, links psychological resources to effective learning. Moreover, autonomous support in the teaching and positive teacher-student interactions boost self-efficacy and motivation, further improving learning outcomes. Together, these factors form a framework for enhancing sports learning effectiveness. At the same time, differences in study design, measurement tools, and cultural backgrounds may limit generalizability. Future research should use longitudinal and mixed-method studies to examine the dynamic role of psychological mechanisms and teaching contexts in sports learning. Additionally, cross-cultural comparisons and intervention studies should verify the effectiveness of integrating psychological and teaching strategies. Through empirical explorations in these areas, strategies for boosting the efficacy of youth sports learning can be further refined.

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