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The Influence of Positive Emotions on Learning Efficacy of College Physical Education Majors

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Abstract:

The current physical education in universities is shifting from a single indicator centered on grades to a composite goal that focuses on students' physical and mental development and long-term growth. The coordinated development of body and mind among college students has received widespread attention. However, there is still a lack of research on the impact of positive emotions on the professional technical learning efficacy of sports majors. This study selected 89 undergraduate students majoring in sports training at the second level or above from Chengdu Sport University as the research subjects, and analyzed the correlation between positive emotions and professional learning efficacy, as well as the differences between genders. This article analyzes that there is a significant positive correlation between positive emotions and specialized technical learning efficacy among students majoring in sports. Positive emotions can explain 13.8% of the variation in learning efficacy, and the level of positive emotions in males is significantly higher than that in females, but there is no gender difference in learning efficacy. Based on this, this article proposes the following suggestions: creating an inclusive and supportive training atmosphere, setting tiered learning goals, controlling exercise load reasonably, and implementing differentiated emotional guidance for different genders.

Keywords: Positive emotions; Learning efficacy; College physical education majors

1. Introduction

1.1 Current Policies and the Status Quo of College Students' Physical Fitness

Currently, physical education is gradually shifting from a single indicator centered on grades to a composite goal that focuses on students' physical and mental development and long-term growth. The results of the 8th National Survey on Student Physical Fitness and Health show that the improvement in the excellent rate of ordinary college students is not significant, and the test scores of various projects need to be improved [1].

1.2 The Correlation Between Individual Psychological States and Sports Learning Outcomes

In specific teaching and training practices, it has been observed that under the same amount of training, there are significant differences in the speed of skill acquisition, training investment, and stability among different students. This suggests that, in addition to training methods and external conditions, individual psychological and emotional states may also be important variables affecting learning outcomes.

1.3 A Review of Existing Research on Psychological Factors in Sports Field

In previous preliminary studies, Zhu et al. explored the psychological aspects after aerobic exercise [2]. Through POMS testing before and after exercise, they found that the scores of various subscales, such as "tension anxiety" and "anger" significantly decreased after exercise, indicating that emotions were improved. In addition, Nakamaru et al. also reported that positive emotional items such as "feeling refreshed" and "full of vitality" significantly increased after exercise, indicating a correlation between exercise and psychological factors [3]. The research results of Zhang Ting and Li Huanyu indicate that learning environment and psychological factors such as teacher autonomy support, academic control, subjective task value, classroom enjoyment, and boredom can have an impact on adolescent physical exercise behavior [4]. This suggests that more attention should be paid to exploring methods and strategies to enhance these learning environments and psychological factors in physical education classes, to promote active participation in physical exercise among adolescents. Based on this, Uguru proposed an analysis of variance (ANOVA) model to predict the psychological training level of student athletes, aiming to establish standards for psychological preparation in the field of sports through the level of physical education learning [5]. In the study by Yi Sun et al., it was found that college students' sports preferences have a significant predictive effect on their participation in sports activities, with positive sports achievement emotions and sports motivation playing key mediating and chain mediating roles [6]. The control value theory of achievement emotion (CVTAE) is a comprehensive framework developed by Pekrun based on expected value theory, evaluation theory, attribution theory, and the impact of emotions on learning to study achievement emotions, their antecedents, and outcomes in education [7]. CVTAE believes that the achievement emotions experienced by students in the educational environment will affect achievement outcomes, regardless of the situation. According to the study by Tian Maofen et al., there is a significant positive correlation between student academic performance and learning self-efficacy, which is influenced by gender, family background, and learning environment [8]. Families with a strong learning atmosphere are more conducive to the formation of learning efficacy, and at the same time, teachers' recognition of students can also have an impact on their learning efficacy. The research by Yang Ali and Zhou Zhenqi shows that boys have significantly better sports motivation than girls, and students in certain cities have higher sports motivation [9]. Boys have significantly better exercise behavior than girls, and middle school students have significantly better exercise behavior than elementary school students. Students in certain cities are more willing to participate in physical exercise.

1.4 Research Purpose and Innovation

Numerous studies have shown a close relationship between psychological factors and sports, but there is still limited research on this topic in China. This study aims to focus on students majoring in sports training at Chengdu Sport University. Based on positive psychology, motivation theory, and self-efficacy theory, it systematically examines the direct impact of positive emotions on sports-specific technical learning and the indirect impact through learning motivation and learning efficacy. By filling the gap between theory and practice, it is expected to provide actionable psychological intervention points for college physical education teaching, consciously cultivate positive emotional experiences, and strengthen students' sense of competence in training design, to improve the efficiency and sustainability of professional learning.

2. Research Methods

2.1 Scale Selection

2.1.1 General Self-Efficacy Scale (GSES)

This study selected the General Self-Efficacy Scale

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(GSES) and the Positive and Negative Affect Scale (PANAS) [10]. This scale was developed by renowned German health psychologists Schwarzer and Jerusalem in 1995, with a Cronbach's alpha coefficient of 0.954 in the translated Chinese version. It is used to assess an individual's level of self-efficacy. The scale consists of 10 items, measured in a single dimension using the Likert 4-point rating system, where 1 represents "completely incorrect" and 4 represents "completely correct". The higher the total score, the higher the self-efficacy.

2.1.2 The Positive and Negative Affect Scale (PANAS)

The Positive Negative Emotion Scale consists of two dimensions, with a total of 20 questions. Among them, 10 questions measure positive emotion experience (PA) and 10 questions measure negative emotion experience (NA). The two dimensions are independent of each other. The scale adopts a Likert 5-point rating system (almost no 1, extremely many 5). The Cronbach's alpha coefficient of the scale in this study is 0.910. Referring to the calculation method of positivity rate in Frederickson et al.'s research, the number of positive emotions rated as 2 or above and the number of negative emotions rated as 1 or above were counted separately. The positivity rate can be obtained by dividing the number of positive emotions by the number of negative emotions. If the number of negative emotions is 0, 1 is used instead to prevent situations where the number is 0.

2.2 Research Object

The research subjects selected a total of 89 undergraduate students from the Sports Training College of Chengdu Sport University, all of whom meet the requirements of national second-level athletes and above, and possess a high level of sports expertise. Among them, the proportion of males is 61.8%, and the proportion of females is 38.2%. The distribution of specialized sports for the research subjects includes 11 sports: frisbee, golf, basketball, volleyball, shooting, archery, taekwondo, tennis, artistic gymnastics, swimming, and badminton.

3. Research Results

3.1 Relevant Analysis

This study will conduct a correlation analysis between positive emotions and self-efficacy in specialized technical learning to verify whether there is a significant correlation between the two. The correlation analysis results showed (Table 1) that the Pearson correlation coefficient between positive emotions and the total score of the Self-Efficacy Scale was 0.371 ($p<0.01$), indicating that students with higher levels of positive emotions have stronger learning efficacy. This suggests that students with higher levels of positive emotions have stronger self-efficacy in specialized technical learning and verifies the positive impact of positive emotions on physical education learning.

This result confirms that positive emotions are an important psychological factor affecting the professional learning efficacy of sports majors. Positive emotional experiences can help students establish stronger self-efficacy beliefs, making it easier for them to form a confident and proactive learning state in specialized technical learning, thereby improving learning efficacy. At the same time, it also confirms the important role of emotional factors in the field of sports professional learning, breaking the traditional concept of only focusing on skill training itself, and highlighting the practical value of psychological and emotional intervention in sports professional teaching.

The positive correlation between positive emotions and learning self-efficacy is consistent with the research theory of Nakamaru et al., which suggests a close relationship between exercise and psychological factors. The research results of Zhang Ting and Li Huanyu also indicate that psychological factors, such as classroom enjoyment, can have an impact on adolescent physical exercise behavior. The results of this study further indicate a close correlation between positive emotions and learning efficacy.

Table 1. Correlation Analysis Results.

		GSES	PANAS
GSES	Pearson correlation of the self-efficacy scale	1	371**
	Sig. (Double-tailed)		000
	Number of cases	89	89
PANAS	Pearson correlation of the self-efficacy scale	371**	1
	Sig. (Double-tailed)	000	
	Number of cases	89	89
**. At the 0.01 level (double-tailed), the correlation is significant.			

3.2 Regression Analysis

This study takes positive emotions as the independent variable and specialized technical learning efficacy as the dependent variable, and uses simple linear regression to verify whether the independent variable can effectively predict the dependent variable. As shown in Table 2 and Table 3, the regression analysis results showed that positive emotions can explain 13.8% of the variance (R^2=0.138) in the sense of efficacy in specialized technical learning. The regression equation was significant (F=13.875, p<0.001), and the non-standardized regression coefficient was 0.165 (p<0.001), indicating that for every unit increase in positive emotions, the sense of efficacy in specialized learning will correspondingly increase by 0.165 units. This confirms that positive emotions are an important intrinsic factor affecting the learning outcomes of sports majors.

Table 2. Significance Results of Regression Analysis.

Model		sum of squares	degree of freedom	mean square	F	salience
1	Regression	445.191	1	445.191	13.875	000b
	Residual	2791.371	87	32.085		
	Total	3236.562	88			
a. Dependent variable: GSES						
b. Predictive variable: (constant), PANAS						

Table 3. Regression analysis results.

Coefficient α								
Model B		Non-standardized coefficient		standardized coefficient	t	salience tolerance	Collinearity statistics	
		standard error	Beta				VIF	
1	(Constant)	20.621	2.524		8.170	000		
	PANAS	165	044	371	3.725	000	1.000	1.000
a. Dependent variable: GSES								

3.3 Gender Difference Test

There are significant differences in positive emotional levels among students of different genders, but no significant differences in learning efficacy. Independent sample t-test showed that the total score of the positive and negative emotion scale for male students (M=58.58) was significantly higher than that for female students (M=50.44) (p<0.01), but the difference in the total score of the self-efficacy scale between male and female students was not significant (p>0.05) (Table 4). Therefore, gender may indirectly affect learning efficacy by influencing positive emotions.

Table 4. Gender difference test results.

	sex	Number of cases	average	Standard deviation	Standard Mean error
GSES	Male	55	30.20	6.302	850
	Female	34	29.03	5.675	973
PANAS	Male	55	58.58	13.672	1.843
	Female	34	50.44	12.238	2.099

4. Research Discussion

4.1 Positive Emotions and Learning Efficacy: Correlation and Analysis

The research results reveal a significant positive correlation between positive emotions and learning efficacy in sports majors, which not only provides empirical support for the development goal of "physical and mental coordination" in sports education. From the perspective of the particularity of studying sports majors, the learning of sports majors is often accompanied by repeated action

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polishing, physical exertion, and experience of success or failure. The presence of positive emotions can help students maintain cognitive flexibility when facing technical bottlenecks, and they are more inclined to attribute failures to controllable effort factors rather than their own ability limitations. This cognitive tendency is an important psychological basis for strengthening self-efficacy. Regression analysis shows that positive emotions can explain 13.8% of the variation in learning efficacy. This result not only indicates the important role of emotional factors in learning outcomes, but also suggests that the improvement of learning efficacy in sports majors is a process of multiple factors working together, which needs to be combined with external conditions such as skill training and environmental support to form a synergy.

4.2 Gender Differences in Positive Emotions and Learning Efficacy

The significant differences in positive emotional levels among students of different genders provide an important basis for the differentiated implementation of physical education teaching. The higher positive emotion scores of male students may be related to factors such as the shaping of different gender temperaments by social culture and gender differences in competitive experiences in sports scenes. However, there is no significant difference in learning efficacy between male and female students, reflecting that sports majors can maintain stable learning confidence and execution willingness through self-regulation regardless of the intensity of emotional experiences formed during long-term training.

4.3 Differentiated Teaching Strategies Based on Gender Characteristics

In teaching, appropriate support should be provided based on the emotional expression characteristics and needs of students of different genders. For female students, the introverted expression of emotions may make it difficult to fully perceive and reinforce their positive experiences. Therefore, teachers need to be more proactive in creating safe emotional communication scenarios, capturing their potential emotional needs through careful observation and feedback. For male students, the sense of achievement brought by competition and challenges is an important source of positive emotions. Reasonably setting up advanced tasks and providing platforms for showcasing abilities can further amplify the promoting effect of emotions on learning effectiveness.

4.4 Construction of Emotionally Safe Teaching Environment

It can create a training atmosphere that is inclusive and supportive, and create an "emotionally safe" teaching environment. In sports training, errors in technical movements and extreme physical challenges are common. The teaching model that overly emphasizes grades and error correction can easily trigger students' anxiety and resistance, while a tolerant atmosphere can reduce students' psychological defense, making them more willing to try complex techniques and actively expose problems. In this environment, affirmation and feedback not only point to the results of technological progress but also focus on students' efforts, strategic adjustments, and perseverance during the training process. Through specific recognition, students can continuously accumulate positive experiences of "I can do it", which will gradually internalize into stable self-efficacy beliefs.

4.5 Optimization of Teaching Design: Hierarchical Goals and Exercise Load Control

The setting of hierarchical learning objectives is to combine the accumulation process of positive emotions with the progressive law of technical learning. When complex specialized skills are decomposed into perceivable and achievable small goals, students will gain a sense of achievement after completing each stage task. Positive feedback can continuously activate emotional motivation, forming a virtuous cycle of "goal achievement, positive emotion, efficiency improvement more efficient learning". For specialized fields such as shooting and archery that require high concentration and stability of movement, the gradual realization of small goals can effectively alleviate students' psychological pressure. The suggestion of reasonably controlling exercise load originates from the basic law of physical and mental interaction - excessive physical exertion can directly lead to emotional exhaustion, and negative emotional experiences in a state of fatigue can have a negative impact on the standardization of technical movements and learning focus, forming a vicious cycle. In practical teaching, the design of exercise load should not only focus on objective training indicators, but also dynamically adjust based on students' subjective emotional feedback and physical recovery status. Adequate rest and physical recovery are not only physiological energy supplements, but also the process of repairing emotional states, which can help students maintain a stable, positive emotional baseline and reserve psychological energy for subsequent learning and training.

4.6 Teaching Implications and Future Research Directions

The promoting effect of positive emotions on the learning efficacy of sports majors reveals that college physical ed-

ucation teaching can take emotions as the starting point, and integrate psychological intervention into the entire process of skill training through comprehensive strategies such as environment creation, goal design, load regulation, and gender adaptation. This approach is in line with the current trend of physical education transitioning from a "skill-based" to a "person-based" approach, and also provides a feasible solution to the teaching difficulty of "significant differences in learning outcomes under the same amount of training". In future teaching practice, the deep combination of emotional guidance and specialized technical characteristics can be further explored, such as strengthening the positive emotions brought by aesthetic experience in expressive projects such as artistic gymnastics, and successfully enhancing collective positive emotions through collaboration in team projects, making emotional intervention more targeted and effective, ultimately achieving synchronous improvement of students' technical ability and psychological literacy.

5. Conclusion

This study is based on positive psychology and self-efficacy theory, focusing on the practical needs of the transformation of physical education in Chinese universities from "performance-centered" to "focusing on students' physical and mental development". It explores the impact of positive emotions on the self-efficacy of specialized technical learning among sports majors, filling a gap in the research on the relationship between psychological factors and learning outcomes in the field of physical education.

Future research can be improved in the following aspects: firstly, expanding the sample size, selecting students from different sports colleges and majors, and ensuring a relatively balanced distribution of sports events; Secondly, constructing a multiple regression model that incorporates variables such as learning motivation, training years, and the teaching style of coaches or teachers, further exploring the correlation between positive emotions and learning efficacy, and providing more refined psychological intervention plans for physical education teaching.

The research subjects of this study are limited to students majoring in sports training at Chengdu Sport University, and the sample size is relatively limited, including only 89 students. At the same time, the gender ratio is not balanced, with a significantly higher proportion of males than females. In addition, although the study covered 11 sports projects, it did not deeply consider the differences in sports characteristics and training modes between different types of sports projects (such as individual and collective projects, skill oriented projects and physical fitness oriented projects), which may have different impacts on the generation of positive emotions and the formation of learning effectiveness in students. This to some extent limits the applicability of the research conclusions..

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