

# Research on the Adaptability and Intervention of Layered Badminton Teaching in Colleges and Universities for Students with Different Psychological Characteristics

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**Abstract:** In the context of the transformation of physical education in universities towards personalization and diversification, the traditional "one size fits all" badminton teaching model is difficult to adapt to the needs of students with different psychological traits. This study focuses on badminton students in a certain university and randomly divides them into an experimental group (stratified teaching) and a control group (traditional teaching). Empirical research is conducted by combining psychological measurements (Big Five personality scale, SCL-90, etc.), skill assessments, questionnaires, interviews, and SPSS analysis. The results showed that there were significant differences in the acceptance of stratified teaching among students with different psychological traits (extroverted and high achievement motivated individuals had higher acceptance, while introverted individuals showed an improvement after guidance); Layered teaching can significantly improve students' badminton skills (the experimental group is better than the control group, and the trait teaching matching group is better), improve their psychological state (alleviate anxiety and depression, improve interpersonal sensitivity), and optimize their learning attitude (enhance interest and initiative); The matching degree between teaching elements and psychological traits is the core influencing factor of adaptability. Research has confirmed that the layered teaching has good adaptability, and targeted interventions can promote students' physical and mental development, providing a basis for badminton teaching reform.

**Keywords:** University Badminton, Layered Teaching, Psychological Traits, Adaptability, Teaching Intervention, Learning Outcome

## 1. Introduction

Against the backdrop of deepening education reform, physical education in universities, as a core element of quality education, highlights its value in nurturing students. It not only undertakes the basic function of improving students' physical fitness, but also plays a key role in cultivating psychological resilience, teamwork ability, and lifelong sports awareness. With the increasing demand for comprehensive quality of talents in society, the goal of physical education in universities has shifted from single skill teaching to diversified talent cultivation, in order to achieve the coordinated development of students' body and mind.

Badminton courses play an important role in university physical education teaching due to their athletic charm and adaptability. It can enhance students' physical fitness (such as improving flexibility, coordination, and reaction speed), as well as shape their competitiveness and psychological qualities. However, there are limitations in current badminton teaching in universities. The traditional "one size fits all" model ignores individual differences in students' physical fitness, sports skills, and psychological traits, which makes it difficult for students with good foundations to unleash their potential, while students with weak foundations are prone to frustration, loss of learning interest, and constraints on teaching quality.

Layered teaching is in line with the concept of "teaching according to students' aptitude" and has gradually been promoted in physical education teaching in universities in recent years. It divides different levels of teaching groups based on students' physical fitness, sports skills, learning ability, and interests, and formulates targeted teaching goals, content, and methods to meet the needs of different students, stimulate learning enthusiasm, and improve teaching efficiency. In badminton teaching, layered teaching

can assist teachers in providing precise guidance, help students overcome bottlenecks, improve skills, and promote mental health. Therefore, studying its adaptability and intervention effects on students with different psychological traits has practical significance.

This study focuses on the adaptability and intervention effect. By analyzing students' psychological traits and combining the theory and practice of hierarchical teaching, it clarifies the learning characteristics and needs of students with different psychological traits, evaluates the impact of hierarchical teaching on students' psychological state, skill improvement, and learning satisfaction, and provides scientific basis and practical guidance for the reform of badminton teaching, in order to achieve the improvement of teaching quality and the comprehensive development of students. In theory, this study can enrich the theoretical system of physical education teaching in universities, expand the application of layered teaching theory in the field of sports, and provide support for innovative teaching methods and interdisciplinary research between psychology and physical education; In practice, it can provide reference for teaching reform, assist teachers in precise teaching, enhance students' interest and confidence, cultivate lifelong sports awareness, improve the quality of physical education in universities, and lay the foundation for cultivating high-quality talents for comprehensive development.

## **2. Study on the adaptability of layered badminton teaching in colleges and universities to students with different psychological characteristics**

### ***2.1 Implementation strategies for layered teaching***

In the layered teaching of badminton in universities, the stratification criteria for students exhibit multidimensional characteristics, covering physical fitness, sports skills, and psychological traits. Physical fitness is evaluated through physical fitness tests, such as aerobic endurance tests for boys running 1000 meters and girls running 800 meters, and limb and core strength tests for push ups, sit ups, squats, etc., providing an objective basis for stratification; The assessment of sports skills focuses on the accuracy and speed of serving, the reaction and stability of receiving, the standardization and strength control of hitting, and clarifies the students' skill level; Psychological traits are evaluated using tools such as the Big Five Personality Inventory and Temperament Type Scale, distinguishing between extroverted (good at collaborative communication) and introverted (skilled in technical research), choleric (passionate and impulsive) and mucinous (calm and slow response), as well as achievement motivation (seeking good results) and social motivation (emphasizing making friends). Testing, questionnaires, and interviews are used to ensure scientific stratification.

Teaching objectives are layered and precisely adapted to meet the needs: the basic level focuses on mastering badminton basic knowledge (development process, rules, etc.) and basic skills (grip, serve, etc.), cultivating interest and cognition; Improving levels focuses on consolidating and enhancing skills (precise and stable application) and cultivating tactical awareness (singles serving and attacking, doubles positioning, etc.), enhancing adaptability; The advanced level emphasizes the innovative application of tactics and the accumulation of competition experience, enhances competitive and collaborative abilities, and cultivates professional qualities.

The teaching content is layered with gradient differences: at the primary level, detailed instruction is given on grip, basic shooting and receiving, and stationary hitting to establish motion perception; Introduce advanced techniques such as high range ball and kill ball at the intermediate level, explain simple doubles tactics and practical exercises; Conduct in-depth research on the offensive and defensive tactical system at an advanced level, and organize high-level competitions to accumulate experience.

The selection of teaching methods is in line with the characteristics of each level: demonstration and imitation methods are used at the basic level, and teachers standardize demonstrations (such as the entire forehand serving process) and correct errors to help students establish correct movement patterns; At the intermediate level, the heuristic exploration method is used to guide thinking and tactical responses in the context of a competition, and through discussion and evaluation, understanding is deepened; At the advanced level, autonomous cooperation is used to assign tasks such as event planning, and students are divided into groups to enhance their comprehensive abilities.

### ***2.2 Empirical research design for adaptability***

To explore the adaptability of stratified badminton teaching in universities to students with different psychological traits, a representative university badminton course student was selected as the research

object. The badminton curriculum at this school has a complete teaching system, with students covering multiple majors and grades, and possessing a solid foundation in research and practice. The study used random sampling to divide students into an experimental group and a control group. The experimental group implemented stratified teaching and developed personalized teaching goals, content, and methods based on physical fitness, motor skills, and psychological traits; The control group adopts the traditional unified teaching mode, teaching according to a fixed outline and plan.

During the sampling process, consideration should be given to the distribution of students' majors, gender ratio, and physical fitness to ensure homogeneity between the experimental group and the control group in the above dimensions and reduce the interference of irrelevant variables. Each major maintains a certain proportion in both groups, and the gender ratio is basically consistent with the physical fitness level, in order to enhance the reliability of research results and promote the value of conclusions.

Empirical research uses multiple tools to collect data: the Big Five Personality Inventory (consisting of five dimensions: extraversion, agreeableness, etc.), Temperament Type Scale (distinguishing between bile and other types), and Motivation Scale (measuring achievement motivation, etc.) are used to evaluate students' psychological traits and provide a basis for adaptability analysis; By using the Learning Interest Questionnaire (covering factors such as liking and participation) and the Learning Satisfaction Questionnaire (covering dimensions such as teaching objectives and methods), we can monitor changes in students' learning interests and provide feedback on teaching evaluations.

The data collection adopts a longitudinal tracking method: before the experiment, two sets of initial data were obtained through a psychological trait scale and a learning interest questionnaire; In the experiment, regularly test and record the improvement of students' badminton skills; After the experiment, use the Learning Interest and Satisfaction Questionnaire again to collect final data. In the data processing stage, SPSS software is used for analysis: first, descriptive statistics are used to calculate the mean and standard deviation, and the basic characteristics of the data are sorted out; Further compare the differences between the two groups before and after the experiment through independent sample t-test to determine the impact of stratified teaching on learning outcomes; Finally, through correlation analysis, we explore the correlation between psychological traits and learning interest and satisfaction, as well as the role of matching teaching elements with psychological traits in learning outcomes, providing empirical support for adaptability research.

### ***2.3 Adaptation research results and analysis***

Experimental data analysis shows that there are significant differences in the acceptance of layered badminton teaching among students with different psychological traits [1]. Outgoing students have a higher acceptance rate and tend to communicate and compete with students at different levels. They believe that layered teaching can provide more opportunities for self-expression to stimulate learning motivation, and can actively collaborate and leverage their strengths in group exercises and competitions; Introverted students have a lower initial acceptance rate and are prone to discomfort due to being in the same class as unfamiliar classmates. However, with the progress of teaching and the attention and encouragement of teachers (such as providing independent practice and presentation opportunities), their acceptance rate will increase as their learning needs are met.

At the level of motivation types, students with strong achievement motivation are highly recognized and believe that hierarchical teaching can set challenging goals based on their own level. They actively participate in high-intensity training at advanced levels to pursue excellence; The acceptance of students with social motivation as the main factor depends on the same level communication atmosphere and opportunities for teamwork, and a good social environment can enhance their willingness to accept.

Comparing the experimental group with the control group, stratified teaching has a significant impact on learning outcomes. In terms of skill improvement, the experimental group performed better than the control group, especially when the teaching level, methods, and psychological traits matched (such as strong spatial cognition and hands-on ability in practical operations and personalized guidance), the skill mastery was faster; In terms of learning interest, the experimental group showed a significant improvement in interest after the experiment, while the control group showed no significant changes. Layered teaching can stimulate interest through targeted and interesting teaching content and methods (such as providing innovative teaching for curious and enthusiastic explorers); In terms of learning satisfaction, the experimental group is higher than the control group because it can meet personalized needs and optimize the learning experience.

The matching degree between teaching objectives, content, methods, and psychological traits is the

core influencing factor of adaptability. Goal matching can stimulate motivation, such as setting challenge goals for achievement driven strong individuals and easy to achieve goals for weak motivated individuals; Content matching should be tailored to the learning characteristics, such as providing tactical theories and cases for theoretical analysts and increasing practice opportunities for practitioners; Method matching affects the effectiveness, such as using demonstration imitation method for imitators, inspiring exploration method and autonomous cooperation method for explorers. Teachers need to fully understand students' psychological traits, optimize the matching of teaching elements to enhance adaptability, and promote students' comprehensive development.

### **3. Intervention study on stratified teaching of badminton in universities for students with different psychological traits**

#### ***3.1 Intervention objectives and content***

The intervention of differentiated badminton teaching in universities for students with different psychological traits, using targeted teaching measures and psychological counseling as means, aims to improve students' psychological state, enhance badminton learning effectiveness and experience, and promote comprehensive development [2]. The core goals include enhancing students' confidence (overcoming barriers such as inferiority and timidity, improving self-awareness and self-efficacy), cultivating sports interest (stimulating internal motivation, forming a positive learning attitude) [3].

The intervention content is differentiated. For introverted individuals with insufficient self-confidence, encouraging teaching and personalized guidance are adopted. Simple tasks are set (such as continuously serving to meet the standard) and timely recognition and praise are given to help them build confidence in successful experiences; For individuals with anxiety and emotional instability, emotional management training should be conducted to teach deep breathing, muscle relaxation, and positive self-suggestion techniques (such as using the "I can perform well" suggestion in pre match guidance), helping them regulate stress and stabilize their mentality.

In addition, the intervention also covers the cultivation of teamwork spirit and the improvement of resilience: for those who are self-centered and have weak team awareness, design doubles and team events to guide them to clarify their role responsibilities and learn to cooperate; For those who are prone to setbacks and give up easily, by sharing inspirational stories of athletes and setting up moderate setback situations, we can help them analyze the reasons for their failures, learn from their mistakes, and cultivate resilience.

#### ***3.2 Implementation of intervention measures***

Differentiated teaching strategies should be implemented for students with different psychological traits. For extroverted, lively and active individuals, competitive teaching is adopted to organize group competitions, individual challenges, etc., to stimulate their competitive awareness and desire to win. At the same time, they are arranged to serve as team leaders or organizers to demonstrate their leadership and communication skills; For introverted and quiet individuals, heuristic and individual guidance teaching are adopted, providing independent thinking and practice space. Through questioning, in-depth thinking of technical principles is guided, and timely one-on-one guidance is provided when encountering problems; For biliary students, use task driven teaching to assign challenging tasks that require patience (such as continuous high-quality hitting) to help them control their emotions and cultivate focus; For students with multiple blood types, diversified teaching (gamification, multimedia teaching) and rich content are adopted, and high difficulty techniques (such as diagonal check in front of the internet) are regularly updated to maintain learning interest.

In terms of personalized psychological counseling, the school is equipped with professional psychological counselors to provide face-to-face services and solve problems such as learning pressure and competition anxiety; Organize mental health lectures (such as coping with competition pressure) and invite experts or athletes to share their experiences; Carry out group psychological counseling, organize students with similar traits to participate in team cooperation activities (such as "trust backfall"), and improve their psychological quality.

The diversified teaching evaluation system needs to integrate dimensions such as skills, attitudes, and progress, combining process evaluation (classroom performance, training participation) and summative evaluation (final assessment), and adopting a combination of student self-evaluation, peer evaluation,

and teacher evaluation. We provide timely feedback after evaluation, affirm outstanding students through face-to-face communication, written comments, etc., help problem students analyze the causes and develop improvement plans, regularly hold teaching feedback meetings, and adjust teaching strategies based on student suggestions.

### **3.3 Evaluation of intervention effectiveness**

To objectively evaluate the intervention effect of layered badminton teaching in universities on students with different psychological traits, a multidimensional evaluation system is constructed, and research is conducted using scientific methods. The psychological state assessment adopts the Symptom Checklist-90 (SCL-90), Self-Rating Anxiety Scale (SAS), and Self Rating Depression Scale (SDS) to measure students' mental health level from dimensions such as anxiety, depression, and interpersonal sensitivity. The changes are analyzed by comparing the scores of the scales before and after intervention; The evaluation of badminton academic performance focuses on skill assessment (accuracy and proficiency in techniques such as serving and receiving) and competition performance (tactical application, mentality), comparing the results at the beginning and end of the semester to determine the effectiveness of skill improvement; We will combine learning attitude assessment with questionnaire surveys (interests, initiative, etc.) and classroom observations (listening, practicing participation) to comprehensively analyze attitude changes; At the same time, interview methods are used to communicate face-to-face with students to understand their learning experiences, problems, and suggestions, and to supplement the evaluation from a subjective perspective.

The evaluation results show that the intervention effect is significant. At the psychological level, after intervention, students' scores on the scale significantly improved: SAS and SDS scores significantly decreased, and anxiety and depression were effectively relieved; The scores of various factors in SCL-90 have decreased, and issues such as interpersonal sensitivity have improved, especially for introverted and anxious students who have benefited significantly, becoming more outgoing and confident, and actively participating in learning and communication.

At the level of academic performance, students' skills and competition performance have significantly improved: technical movements are more standardized and accurate, and footwork is more flexible; Enhanced tactical application ability and more stable mentality during the competition. Students with different psychological traits have made progress, and those with strong achievement motivation have shown outstanding performance. They have obvious advantages in mastering difficult techniques and applying tactics, and actively challenge themselves to improve their competitive level.

At the level of learning attitude, students' interest and initiative in courses have significantly increased: the questionnaire shows an increase in course satisfaction, with an increase in the proportion of students actively participating in classroom and post class exercises; Classroom observations have found that students are more focused in listening, with increased frequency of practice participation, questioning, and communication discussions. Students who originally had a negative attitude are also stimulated by layered teaching and personalized intervention, transforming into active learners.

The comprehensive evaluation shows that the intervention measures for layered badminton teaching in universities are effective, which can improve students' psychological state, enhance their academic performance and attitude, and help students with different psychological traits find suitable learning paths to achieve personalized development. In the future, it is necessary to further improve the teaching mode and intervention measures, optimize the quality of physical education to promote students' comprehensive development.

## **4. Conclusion and future work**

This study conducted an in-depth exploration of layered badminton teaching in universities, comprehensively analyzed its adaptability and intervention effects on students with different psychological traits, and drew the following conclusions.

In terms of adaptability, students with different psychological traits show significant differences in their acceptance of hierarchical teaching. Outgoing students have a higher acceptance of layered teaching, and they are able to actively communicate and cooperate with their classmates in layered teaching, fully leverage their own advantages, and enjoy the fun of competition; Introverted students have a relatively low acceptance of layered teaching in the initial stage, but as the teaching progresses, their acceptance gradually increases when they feel the fit of layered teaching with their own learning pace. Students with

strong achievement motivation highly recognize layered teaching, believing that it can set challenging goals for themselves and motivate them to continuously improve; The acceptance of stratified teaching by students with social motivation mainly depends on the communication atmosphere and opportunities for teamwork among peers at the same level.

Layered teaching has had a significant positive impact on the learning outcomes of students with different psychological traits. The experimental group students showed a significant improvement in badminton skills compared to the control group, especially when the teaching level and methods were highly matched with the students' psychological traits, resulting in a more significant improvement in their skills. In terms of learning interest and satisfaction, the experimental group students also showed significant improvement. Layered teaching can provide more targeted and interesting teaching content and methods based on students' psychological traits and learning needs, thereby stimulating students' learning interest, improving learning experience and satisfaction.

The matching degree between teaching objectives, teaching content and teaching methods and students' psychological traits is a key factor affecting the adaptability of hierarchical teaching. When teaching objectives match students' achievement motivation and learning abilities, it can effectively stimulate students' learning motivation; When the teaching content is in line with students' interests, hobbies, and cognitive styles, it helps to improve students' learning enthusiasm; When teaching methods adapt to students' learning characteristics and psychological needs, they can improve teaching effectiveness and promote students' comprehensive development.

In terms of intervention research, stratified badminton teaching in universities has achieved significant results in intervening students with different psychological traits. Through targeted teaching strategy adjustments, personalized psychological counseling and support, and optimization of teaching evaluation and feedback mechanisms, students' psychological state has been significantly improved, their badminton academic performance has significantly improved, and their learning attitudes have also undergone positive changes.

Specifically, adjusting teaching strategies for students with different psychological traits can meet their personalized learning needs. For extroverted students, competitive teaching strategies stimulate their sense of competition and desire to perform; For introverted students, heuristic and individual guidance teaching strategies provide them with sufficient space for thinking and practice, enhancing their learning confidence. Personalized psychological counseling and support measures, such as professional psychological counseling, mental health lectures, and group psychological counseling activities, effectively alleviate students' psychological pressure, enhance their confidence and teamwork spirit. The optimization of teaching evaluation and feedback mechanism adopts a diversified evaluation system and timely and effective feedback methods to comprehensively and objectively evaluate students' learning situation, promoting students' self-reflection and self-improvement.

Based on the conclusions of this study, the following suggestions are proposed to further improve the quality of badminton teaching in universities and promote the comprehensive development of students.

In terms of promoting teaching modes, universities should actively promote the badminton layered teaching mode based on students' psychological traits. We will strengthen the promotion of the concept and methods of hierarchical teaching, so that teachers and students fully recognize the advantages and importance of hierarchical teaching. We organize teacher training and seminars on tiered teaching, sharing successful experiences and cases to enhance teachers' ability and level in implementing tiered teaching. We encourage teachers to flexibly apply layered teaching strategies based on students' actual situations, continuously optimize the teaching process, and improve teaching effectiveness.

Teacher training is the key to improving teaching quality. Universities should strengthen professional training for badminton teachers, regularly organize them to participate in badminton teaching skills training, psychology knowledge training, etc., to improve their professional competence and teaching ability. We invite experts, scholars, and excellent coaches in the field of badminton to give lectures and provide guidance at the school, broaden teachers' horizons, and update teaching concepts and methods. We encourage teachers to conduct teaching research and reform, explore teaching models and methods suitable for students with different psychological characteristics, constantly innovate teaching concepts, and improve the pertinence and effectiveness of teaching.

The construction of teaching resources is an important condition for ensuring the smooth implementation of hierarchical teaching. Universities should increase investment in badminton teaching resources, improve teaching facilities, increase the number of badminton courts and equipment, improve the quality of courts and equipment, and provide students with a good learning and training environment.

We develop rich teaching materials, such as instructional videos, electronic lesson plans, online courses, etc., to meet the learning needs of students at different levels. It is establish a teaching resource sharing platform to promote communication and sharing of teaching resources among teachers, and improve the efficiency of teaching resource utilization.

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