



Expected Key Success Factors Affecting the Achievement of Major Physical Education University Students

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Abstract

Background and Aim: Majoring in physical education enhances students' motor skills, physical health, and overall well-being while encouraging self-discipline and teamwork. It also promotes a favorable attitude about living an active lifestyle and has long-term health benefits. The study aims to identify key success factors influencing the achievements of university students majoring in physical education, focusing on improving program outcomes, which would enhance readability and professionalism.

Materials and Methods: This research analyzed various factors affecting students' academic performance through a Delphi evaluation by 17 experts and a questionnaire survey of 154 major physical education university students. In this study, the research focused on the senior students at the School of Physical Education at Guangdong Comprehensive University. The correct total population of senior students in the School of Physical Education is 258. Therefore, the sample size was determined using the Krejci and Morgan Table based on this corrected population size. The final sample consisted of 154 senior students, and questionnaires were distributed to these 154 high-grade students in the physical education program.

Results: The study identified key factors influencing university students' achievements in physical education, categorized into personal, service and environmental, teaching, social and cultural, teacher factors, and academic achievement. Personal factors include attendance, participation, and attitude, which enhance engagement and learning outcomes. Service and environmental factors cover facilities, resources, and support services that improve the overall learning experience. Teaching factors focus on instructional design, assessment, and feedback to align with students' learning needs. Social and cultural factors highlight peer support, cultural influences, and organized sports in shaping students' sports participation. Teacher factors emphasize expertise, teaching methods, and interaction, which foster students' skill development and interest. Academic achievement is driven by performance, motivation, goals, and access to necessary resources for success.



Conclusion: The study identified six key success factors influencing university students' achievements in physical education, comprising 33 indices. These factors include personal (attendance, engagement, attitude, preparation), service and environment (facilities, resources, support services), teaching (instructional design, delivery, assessment, support), social and cultural (social and cultural influences, organized sports), teacher (expertise, approach, support, interaction, influence), and academic achievement (performance, motivation, goals, resources). This research provides insights into improving program effectiveness by addressing these multidimensional factors.

Keywords: Physical Education; Achievement; Key Success Factor; Delphi Method

Introduction

Physical education plays a crucial role in promoting health and well-being among major physical education university students (Pasek et al., 2020). Despite its importance, however, physical education achievements are often influenced by various factors that can either enhance or impede students' performance (Trudeau et al., 2008). Identifying those key success factors that have the most significant impact on physical education achievements is, therefore, of utmost importance. Moreover, the physical education achievements of major physical education university students have become one of the main focal points in the field of education, and researchers continue to discuss this topic extensively.

Research in this area mainly focuses on two aspects: general influencing factors and key influencing factors. In terms of general influencing factors related to students' academic success, sex, university attended, method of choosing a major, and parental education are considered important factors (Liu & Pásztor, 2022). Additionally, variables such as career counseling, departmental teacher support, and communication with teachers have been found to have a significant impact on the physical education achievements of major physical education university students. (Eratlı & Şahin, 2020). On the other hand, key influencing factor studies have shown that factors related to teachers are relatively more closely associated with students' academic performance. (Zhang et al. 2012).

Based on the above analysis, it can be concluded that both general and key influencing factors impact the physical education achievements of Major physical education university students. While general factors such as sex, university attended, method of choosing a major, and parental education play a role, key factors related to teachers are more closely associated with student academic performance. Additionally, variables such as career counseling, departmental teacher support, and communication with teachers have also been identified as significant factors. Therefore, the purpose of this study is to investigate the key success factors affecting physical





education achievements for major physical education university students. By exploring these factors, the research aims to provide insights into how universities can optimize their physical education programs and help students achieve their full potential. To accomplish this goal, the study will use a mixed methods approach that combines qualitative and quantitative data collection and analysis methods. Overall, this thesis seeks to contribute to the field of physical education by shedding light on the factors that can play a critical role in enhancing major physical education university students' physical education achievements.

Objectives

Main objective

To examine the multidimensional success factors influencing academic and physical performance among major physical education university students, focusing on personal, institutional, and environmental contexts.

Subsidiary objective

1. To survey the success factors that affect major physical education university students' physical education achievement.
2. To draft key success factors affecting the achievements of major physical education
3. To confirm key success factors affecting the achievements of major physical education university students

Literature review

Motivation and Self-Determination Theory

In terms of explaining the influencing factors of sports performance, motivation and self-determination theory give academic explanations, respectively. Motivation refers to the motivation and energy of an individual to participate in a certain work. Therefore, the importance of individual autonomous motivation and intrinsic motivation is the key factor affecting sports participation and performance. Specifically, autonomous motivation significantly affects adolescents' enjoyment of sports learning, active participation, effort level, and willingness to continue to participate in sports activities in the future, highlighting the profound impact of intrinsic motivation on sports participation and future participation. At the same time, autonomous motivation plays a key role in fostering a sense of pleasure in physical activity, thereby increasing the efforts of adolescents and improving the likelihood that they will continue to participate in physical activity. Therefore, the theory emphasizes the key role of autonomy and intrinsic motivation in promoting sustained participation and high performance in sports activities. Students with intrinsic motivation show a greater tendency to participate in sports activities and thus show



better sports performance, highlighting the influence of intrinsic motivation in promoting sports participation and performance.

Self-determination theory was developed by the American psychologists Deci, Edward L., and Ryan Richard M., and other scholars put forward a theory on the motivational process of people's self-determined behavior. However, self-determination theory does not regard motivation as a single concept and does not simply divide motivation into internal motivation and external motivation. Instead, according to different degrees of self-determination, motivation is regarded as a continuum from unmotivated, external motivation to internal motivation, and external motivation can be integrated with an individual's sense of self according to external rules. It is divided into four types: External regulation, Introduced regulation, Identified regulation, and Integrated regulation. The effect of PE classroom teaching based on self-determination theory on students' PE scores shows that students' satisfaction with basic psychological needs and learning motivation plays a chain intermediary role between PE classroom teaching based on self-determination theory and PE scores, in which internal motivation and identification regulation are positively correlated with students' PE scores. External motivation and non-motivation have a negative correlation with students' sports performance (Gong, 2023).

Perceived Competence and Self-Efficacy

Perceptual ability and self-efficacy also play an important role in explaining the influence of sports performance. This theory holds that an individual's perception of their abilities and self-efficacy beliefs play a key role in shaping athletic performance. Among them, perception ability refers to the ability of the subject to identify, discover, and predict the problems that have been formed or may be formed. Among the factors that affect the correlation of sports achievement, perceptive ability and sex (male), BMI, skill level, sports achievement, sports knowledge, attention, classroom enjoyment, achievement goal orientation, skill learning, exploration, novelty, exploration, pleasure, parental education, and family income can positively predict students' local sports achievement.

The influence of self-efficacy on college students' sports participation and performance. The findings suggest that confidence in one's abilities not only affects one's behavioral choices during the creative process but also influences the setting of future creative goals, effort, and endurance during the creative process. In addition, the study also emphasizes how to improve individual creative self-efficacy through controlling experience and social persuasion to encourage college students to actively participate in sports activities and achieve better results. This understanding emphasizes the importance of cultivating A strong sense of self-efficacy to enhance athletic performance and improve overall athletic outcomes (Sbeih et al.,2021).

Physical Fitness and Health Status



Physical fitness and wellness are associated with improved athletic performance and good athletic results. These studies not only emphasize the direct impact of physical fitness and health status on the athletic performance of college students but also demonstrate the importance of maintaining good physical fitness to improve athletic performance. At the same time, it also emphasizes the positive correlation between physical fitness level and sports performance; that is, physical health and overall health play an important role in shaping college students' sports performance and have a significant impact on college students' sports performance (Sheridan et al., 2019).

In addition, the study also found that improving physical fitness and health status can improve college students' awareness of physical exercise and enhance their determination to engage in sports activities. The training process has also been identified as key to promoting students' physical health, emphasizing the important role of physical exercise in promoting overall health and sports performance (Ji & Ma, 2019).

Goal Setting and Achievement Orientation

Goal setting and achievement orientation play an important role in influencing college students' sports performance. In recent years, more and more research has focused on the positive effects of clear sports goal setting and challenging goal setting on improving students' sports performance and participation. At the same time, the achievement-oriented mentality, as an internal motivation, has a significant impact on promoting students to pursue excellence and improve their sports performance.

In terms of goal setting, research shows that clear and challenging goals can motivate students to be more involved in sports training and improve their sports performance. When students have a clear understanding of their training goals and how they can improve their motor skills by achieving those goals, they are more likely to maintain their enthusiasm and focus on training. In addition, challenging goals can stimulate students to generate stronger motivation, pushing them to go beyond themselves and pursue higher athletic performance.

Achievement orientation is a mentality that is oriented toward the pursuit of success and achievement. Students with this mentality pay more attention to the process of sports training and get satisfaction and a sense of achievement from it. They are willing to face challenges and put in the effort to achieve their goals. This intrinsic motivation can motivate students to participate in sports training more actively and improve their training quality and sports performance. (Roberts et al., 1996).

Time Management and Academic Pressure

The importance of time management and academic pressure as key factors affecting the individual performance of college students in sports. Existing research has highlighted the





importance of effective time management skills in balancing academic commitment and athletic pursuits, ultimately affecting the athletic performance of college students (Gu Yihan et al., 2022).

Taken together, these findings highlight the multi-dimensional and multi-layered impact on college students' sports performance. Intrinsic motivation, self-efficacy, physical fitness, health, goal setting, and time management are the key factors that affect college students' sports performance. Integrating these factors into tailored educational strategies and the development of sports programs can greatly improve athletic performance and overall athletic performance of college students.

Study on influencing factors

Personal factor

Physiological factors, psychological factors, social factors, and behavioral factors will have a profound impact on college students' sports performance and achievement. In terms of physiological factors, the research shows that the physiological state of college students has an important impact on sports performance. The study covers important physiological factors that affect the athletic performance of college students. The research on psychological factors shows that psychological factors play an important role in shaping the athletic achievements of college students and emphasizes the attention to the psychological well-being of athletes. The study of social factors emphasizes the influence of the social environment on college students' sports performance. The study highlights the importance of social factors in influencing athletic performance and achievement among college students. In terms of behavioral factors, behavioral factors play a key role in influencing college students' sports achievements, and it is important to solve the problem of behavioral patterns to improve sports performance and achieve better results (Zhang et al., 2021).

These studies show that individual factors have a complex and multi-dimensional influence on college students' athletic performance and achievement. Therefore, educators and coaches should consider physiological, psychological, social, and behavioral factors to develop effective training plans and strategies to improve the athletic performance and achievement of college students.

Services and environment

College students' sports performance is not only affected by physiological, psychological, social, and behavioral factors but also closely related to their environment and services. Coaching and encouragement play a key role in the confidence and motivation of college students, while well-designed physical education programs and facilities help to improve students' athletic performance. Service and environment are also key factors that affect college students' sports performance. Such studies have highlighted the important role of coaches, highlighted the role





of facilities and resources (Gafurov et al.,2020), and emphasized the importance of social support systems and team climate (Labrague et al.,2020).

In a word, college students' sports performance is not only affected by individual internal factors but also by external factors such as service and environment. Coaching, good facilities, and a variety of activity options can all create the ideal training and participation environment for college students to improve their sports performance and outcomes. Therefore, educators and coaches should take these factors into account to formulate effective training plans and strategies to promote the physical and mental health and social development of college students.

Teachers, family, and friends

Numerous studies have explored the impact of teachers, family, and friends on college students' athletic performance. Such studies have focused on factors such as social support, motivation, and psychological influence. The research highlights the key role of teacher attitudes, expectations, and trust in students' participation in physical activity and their athletic achievement. In addition, family sports atmosphere and family members' participation in sports activities will also affect college students' sports performance. Family support and care play an important role in cultivating students' sports enthusiasm and performance, and family members actively participate in students' sports life, encourage them to participate in various sports activities, and provide financial support and time assistance. In addition, this paper studies the influence of peer relationships on college students' sports performance, including peer motivation, competition, and cooperation. This study analyzed the influence of peer groups on college students' sports attitudes, sports motivation, and sports behavior and emphasized the important role of friends in encouraging companionship and cultivating perseverance, confidence, and motivation (Quan & Lu, 2020).

It can be seen that the study of college students' sports performance involves many aspects, such as physiology, psychology, society, and behavior. Individual internal factors such as physiological state, psychological characteristics, and behavioral habits will affect their sports performance. External factors such as teachers' guidance, family atmosphere, and friends' support also have an important impact on college students' sports performance. Therefore, educators and coaches need to take these factors into account when formulating training plans and strategies to better promote the development of physical and mental health and social ability of college students.

Related research

Localize research

Chinese college students face heavy pressure and workload in their studies, resulting in an unbalanced distribution of time, which directly affects their time and energy to participate in



sports activities, thus affecting their sports performance. Huang (2023), in the article "The Impact of Physical Education on College Students' Physical Education Scores," used adjustment analysis, literature, and other research methods to discuss that physical education teachers' teaching content, teaching methods, and teaching attitudes had no significant effect on college students' physical health test scores. The reason for this phenomenon may be the failure of students to develop sports habits and the inefficiency of the college's physical education teaching mode. It is found that college physical education teachers should strengthen the connection between teaching content and students' physical fitness test items in teaching design and mobilize students' enthusiasm for physical fitness through teaching methods to achieve the goal of improving students' physical health level.

Yang (2022), in his article "Analysis of Factors Affecting the Scores of Students Majoring in Basketball for College Students in Guangdong Province," used the methods of literature, interview, and actual investigation to discuss the real performance of students in the examination process, understand the factors affecting their scores, find out the problems, and finally put forward relevant suggestions. It is found that there are many uncertain factors in the special examination of basketball for college students in Guangdong Province. Against the background of technological renewal and iteration, it is particularly important to improve one's quality and adaptability to the environment.

In the article "Analysis of Factors Affecting 400m Hurdle Performance in Track and Field Teaching", Peng & Ye (2018) took 2014 students majoring in physical education from the Physical Education College of Zunyi Normal University, Guizhou Province, as an example and adopted research methods such as literature, questionnaire, field investigation, and interview. This paper analyzes the factors that affect the 400m hurdle performance of 2014 students majoring in physical education at the Physical Education College of Zunyi Normal University and finds that it is particularly important to use the teaching mode of group cooperation to help students improve their physical skills.

Du (2021) took the Guilin Institute of Aerospace Technology as an example to discuss the influencing factors of sports performance in ordinary colleges and universities in his paper "Research on the Influencing Factors of Sports Performance in Ordinary Colleges and Universities," and adopted research methods such as literature review, participatory observation, and logical analysis. It is found that individual events are superior to collective events, and collective events have more factors to create sports results than individual events. The contradiction between "learning" and "training" is the core factor affecting the sports results of ordinary colleges and universities.





Chen & LIN (2021) discussed the influencing factors and ways to improve sports achievements of College students in the paper "Research on Influencing Factors and Ways to Improve Sports Achievements" by using research methods such as literature data and mathematical statistics. It is found that the main ways to improve sports performance include: the school level should strengthen the leadership to support the school sports work, improve the school sports facilities; At the level of teachers, we should set up special teaching and research on physical education, attach importance to the standardized teaching of test-taking actions, implement the transformation work of underachiever in physical education, and solve the common phenomenon of uneven performance between men and women. Parents should actively participate in co-management and expand extracurricular activities.

Luo (2016), in the paper "Research on Influencing Factors and Countermeasures of College Students' Sports Achievements in Hunan Province," discussed the factors affecting college students' sports achievements and put forward corresponding countermeasures by using research methods such as literature review, expert interview, questionnaire survey, and mathematical statistics. It is found that it is particularly important to strengthen the training of students' physical and psychological quality, arrange the training content reasonably, concentrate on special training, improve the teaching quality of technical movement, and adapt to various environmental changes.

Zhang (2016), in his article "Current Situation and Roots of Utilitarianism in Academic Evaluation in Universities," used many research methods such as literature review, empirical analysis, and questionnaire survey to discuss the importance of academic achievement in China's higher education evaluation system and its far-reaching impact on students. The study found that China's higher education evaluation system tends to focus heavily on students' academic performance at the expense of other aspects, such as physical education and learning.

Wang & Yu. (2017) In the "Survey and Analysis on Physical Exercise Attitude, Sports Investment, and Life Quality of Some College Students in Zhejiang Province" article, using literature review, questionnaire survey field observation, and other means, This paper discusses that the academic expectation and requirement of family, society, and school to college students is an important factor that affects college students' sports achievement. The study found that some families pay more attention to academic results while ignoring the cultivation and requirements of college students' sports quality, which will lead to college students' self-worth and sense of achievement in sports being relatively low. In addition, social concepts also have a certain impact on college students' sports participation. In some traditional cultures, there exists the idea of neglecting sports, which limits college students' participation in and attention to sports to a certain extent. The study believes that to improve the participation of college students in





sports, families, society, schools, and individual students need to work together. Families should pay more attention to the cultivation and requirements of college students' sports quality, society should change the idea of neglecting sports, schools should strengthen the pertinence and effectiveness of physical education, and students should actively cultivate sports interests and exercise habits.

Wang et al. (2019), in "Comparison of the current status of physical education courses in Chinese and American The article "universities," analyze the differences in the allocation of sports facilities and resources among different universities using a literature review, questionnaire survey, and field investigation. Some universities may lack modern sports facilities and sufficient resources. This unfair phenomenon will directly affect the physical exercise and performance of college students. This paper deals with the difference in sports facilities and resource allocation in colleges and universities and their influence on college students' physical exercise. It is found that the difference in sports facilities and resource allocation also affects the attitude and participation of college students in physical exercise. In colleges and universities with good sports facilities and resources, college students are more likely to develop their interest and enthusiasm for physical exercise and actively participate in various sports activities, thereby improving their physical fitness and sports performance. On the contrary, in colleges and universities with scarce sports facilities and resources, college students may become inactive due to a lack of exercise opportunities, leading to a decline in physical fitness and poor athletic performance. Based on this finding, the study argues that universities should strive to achieve fairness in the allocation of sports facilities and resources. Through strengthening investment and construction, improve the quality and quantity of sports facilities, and provide sufficient opportunities and conditions for college students to exercise. At the same time, colleges and universities should also pay attention to students' physical exercise needs and formulate corresponding policies and measures to encourage college students to actively participate in physical exercise and improve their physical quality and health level.

Sui (2018), in the article "Research on the Paths to Promote Physical Exercise from the Perspective of Social Ecology," Using a literature review, questionnaire survey, and field investigation, this paper discusses the influence of the diversity of physical education and the difference between teachers' professional level on the design of physical education curriculum in colleges and universities. The research involves the diversity of the college PE curriculum, the difference in teachers' professional levels, and their influence on curriculum design. Moreover, the difference in teachers' professional levels is also one of the important factors affecting the design of the PE curriculum. Teachers with higher professional levels are more able to design challenging and interesting courses according to students' needs and interests, and encourage





students to actively participate in physical exercise. Teachers with lower professional levels may pay more attention to skill transfer and test scores, resulting in less innovative and attractive curriculum design. The research holds that colleges and universities should strengthen the investment and construction of physical education, improve the professional level of teachers, and promote the diversified development of the physical education curriculum. By providing diversified physical education courses and professional faculty guidance, colleges and universities can better stimulate students' interest and participation and promote their physical health and all-around development.

Overall, distinct issues exist across various levels, encompassing personal factors, service, and environment, as well as teachers, families, and friends. Resolving these challenges demands societal attention, including fostering individual self-awareness, enhancing the quality of services and environments, and providing appropriate guidance and support from teachers, families, and friends, all of which can contribute to the comprehensive improvement and healthy development of college students' sports achievements.

Foreignize Research

Foreign studies show that college students face challenges in terms of academic burden and time management. Beckett (1991) in "The effects of two teaching styles on college students' achievement of selected physical education. Using the method of a teaching experiment, the outcomes explore the influence of teaching or class composition style on college students' elective physical education achievement. The study found that no significant differences were found between practical (Type B) and inclusive (Type E) teaching or class composition styles on movement tasks. However, significant differences in written knowledge tests showed that E-type students scored higher than B-type students.

In the article "Stressors and Stress Responses of Filipino College Students," Dy et al. (2015) adopted research methods such as literature review, empirical analysis, and questionnaire survey. It explores the academic pressure, workload, and limited time management faced by college students, which may affect their participation and performance in sports activities. The study found that academic pressure and class load are two of the main factors that affect college students' effective time management and participation in sports activities. Students often face heavy schoolwork loads and academic pressures that make it difficult for them to manage their time effectively and participate in sports activities, thus affecting their athletic performance. To improve the athletic performance of college students and promote their all-around development, a series of measures should be taken to help them better balance the relationship between academic work and physical exercise.





Zanevskyy & Zanevska (2021) adopted the research method of mathematical statistics in the article "Academic and Sports Achievements of the Physical Culture and Sports Major Physical Education University Students." An attempt was made to create a model to study the relationship between academic performance and sports performance of sports college students. The study found that the well-known paradigm of a significant relationship between student academic performance and athletic performance is not borne out by the results of this study and should be investigated in more depth.

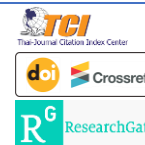
The article "Individual Factors Affecting Rugby Sevens Match Performance" adopted the methods of literature, mathematical statistics, and experiments. The independent influence of individual characteristics on physical and technical performance is discussed. The study found that increases in muscle soreness, stress, and VIFT were associated with small increases in physical and technical performance values, with most of the differences in physical and technical performance requiring a range of health indicators. These factors can be modulated by coaches or practitioners to achieve a favorable physiological preparation that improves athletic performance.

McCreary et al. (2019), in "Past Sports Participation, Self-Efficacy, Goal Orientation, article "and Academic Achievement Among College Students," explore the relationship between past participation in sports (high school) and general college self-efficacy, goal orientation, and sports performance. The development of intrinsic motivation is particularly influential in terms of sports performance goals.

Juezan & Osorno (2022) et al., "Sports Performance Anxiety and Sports Confidence Among College Athletes: The Moderating Effect of Friendship Quality "uses a non-experimental quantitative research design and a descriptive, correlational, and causal design. The effects of sports performance anxiety, sports confidence, and peer relationships on the sports performance of college students in Davao Sul and Davao West State University were studied. The research shows that sports performance anxiety and sports confidence peer relationships are significantly related to sports performance.

The article "The Importance of Muscular Strength in Athletic Performance" adopted the methods of literature and experiment. This paper discusses the influence of strength exercises on various factors related to college students' sports performance and the benefits of strengthening muscle strength. Studies have found that greater muscle strength improves the ability to perform general motor skills, such as jumping, sprinting, and swerving tasks, improves performance on specific motor tasks, and enables people to reach their potential earlier and to a greater extent while also reducing the risk of injury.





Beauchemin et al. (2014), in "College student-athlete wellness: In 'An Integrative Outreach Model," this paper uses a literature review, empirical analysis, and questionnaire survey to explore the effects of economic and resource constraints, cultural background, and social prejudice, mental health, and stress management on college students' sports performance. The research involves the quality and quantity of school sports facilities, students' willingness and opportunity to participate in sports, psychological stress, and emotional problems. It is found that economic and resource constraints are important factors affecting school sports facilities. Due to insufficient funding and resources, schools may not be able to invest enough money and resources to maintain and update sports facilities, resulting in the quality and quantity of facilities suffering. This will limit the students' athletic activities and training, which will affect their athletic performance. To improve college students' sports performance, many factors should be considered comprehensively.

Arede et al. (2018) in "Effects of a combined strength and conditioning training program on physical Abilities in. In the article "Adolescent Male Basketball Players," literature, experiments, mathematical statistics, and other research methods were used to discuss the influence of college students' basketball stability training on basketball performance. The research found that compared with conventional basketball training, the stability training program can improve the leaping and sprinting ability of college students. These results suggest that 6 weeks of stability training is effective in improving neuromuscular control and performance in college basketball players.

Burstein (2023), in "The impact of public opinion on public policy: A review and an agenda, which includes literature review, empirical analysis, questionnaire survey, and other research methods, points out that a coach's guidance and motivation, public opinion, and evaluation system are the key factors affecting college students' sports performance. The research involves the influence of coaching level and motivation, public opinion, and evaluation systems on college students' sports performance. It is found that a coach's guidance and motivation is one of the important factors that affect college students' sports performance. The level and motivation of a coach may affect a student's skill development and competition performance. An experienced and motivational coach can help students better understand skills, improve their performance levels, and boost their confidence. In addition, public opinion and evaluation systems will also have an impact on college students' sports performance. Assessment criteria and the degree of acceptance of public opinion may influence the level of student engagement and performance. A fair and objective assessment system can encourage students to actively participate in sports, improve their performance levels, and give recognition to their efforts. According to the research, various factors can affect the athletic performance of college students, so it is necessary to



consider all kinds of factors and take corresponding measures to improve the athletic level of college students. By improving the guidance and motivation of coaches, establishing a fair and objective evaluation system, and strengthening public publicity, the enthusiasm and performance level of college students can be improved to participate in sports activities to promote their physical and mental health and all-around development.

Summaries of literature and research review

In examining the success factors influencing college students' sports achievements, a range of personal, environmental, and institutional elements has been identified. Notably, psychological resilience, time management, the availability of sports facilities, and the role of mentors such as coaches, teachers, and family members all play integral roles in shaping students' sports participation and performance. Moreover, societal factors, including cultural attitudes towards sports and the educational emphasis on academic achievement, can also significantly impact students' sports engagement and outcomes.

The studies underline the need for a holistic approach, encompassing the fostering of psychological well-being, the provision of adequate resources and facilities, and the cultivation of supportive and inclusive environments within educational institutions. Furthermore, addressing cultural stereotypes and societal attitudes towards sports can encourage more active participation and enhance the overall sports achievements of college students.

Conceptual Framework

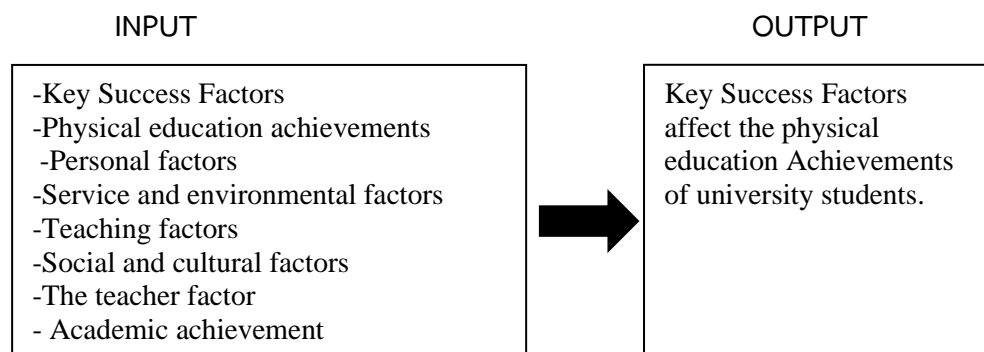


Figure 1 Conceptual Framework

Methodology

Population and Sample

In this study, the research focused on the senior students of the School of Physical Education at Guangdong Comprehensive University. The correct total population of senior students in the School of Physical Education is 258. Therefore, the sample size was determined



using the Krejcie and Morgan Table based on this corrected population size. The final sample consisted of 154 senior students, and questionnaires were distributed to these 154 high-grade students in the physical education program.

Experts and Identification

To ensure the scientificity and objectivity of the research, the Delphi Method will be used to identify the key success factors affecting the achievement of college students majoring in physical education. In the initial stage of the Delphi method, the selection of experts is directly related to the validity and accuracy of research results.

Experts will be selected based on the following criteria: First, they must have extensive research or practical experience in the field of physical education, especially in the development and achievement of university students; Secondly, experts have published research results in related fields in the past five years or have made outstanding achievements in teaching practice; In addition, to ensure the comprehensiveness of the research, the expert team will include experts from related fields such as pedagogy and psychology to provide interdisciplinary perspectives. This study invited a total of 17 experts, forming a diverse team of experts. The team will consist of professors and researchers in the field of physical education, administrators of physical education departments, and frontline teachers with rich teaching experience (Table 1). On this basis, three experts were selected to complete the IOC check for content validity, all 17 of whom had at least 5 years of teaching experience.

Research Instrument

Questionnaires

1. The design of the questionnaire

After referring to the relevant literature, this paper developed a questionnaire outline based on the five success factors studied. Then, through communication with relevant experts and drawing on their opinions, we further improved the questionnaire outline. Finally, the questionnaire content was completed.

In addition, we also use the Delphi method, through two rounds of review by 17 experts, to verify the effectiveness of the questionnaire and further refine the questionnaire.

2. Finding the quality of the tool.

The quality of the questionnaire must be at a level of 0.50 or higher to be used. The reliability of the scale was assessed by the Cronbach α correlation coefficient. Cronbach has a statistic value of 0.85, indicating a high degree of internal consistency between the items in the questionnaire.

Interview forms

1. The design of the interview form

Drawing on relevant literature, we initially formulated an interview form centered around the five success factors under study. Subsequently, we engaged in discussions with pertinent experts, incorporating their insights to refine the interview form. After multiple iterations, the design of the interview form was finalized.



Two rounds of reviews involving 17 experts were conducted through focused group discussions. This method allowed for collaborative refinement and ensured the comprehensiveness and relevance of the interview form.

2. Reliability and validity test of interview forms

To ensure the reliability and validity of the interview form, this study examines the content validity and reliability tests. On the one hand, this study invited three field experts to review the contents of the interview form. The questions in the interview sheet were evaluated by the experts based on their expertise and experience to ensure their relevance and comprehensiveness. In this study, the IOC value is 0.85, which indicates that the interview table has good content validity. In terms of reliability testing, to test the reliability of the interview table, this study conducted two interviews with 15 different students, each interview was one week apart. This reduces the memory effect and ensures that students' responses are based on their actual experiences and feelings rather than memories of the first interview. This study recorded the answers from both interviews and used the statistical method, Cronbach's alpha coefficient, to calculate reliability. In this study, Cronbach's alpha coefficient was 0.90, indicating that the interview table had high reliability.

IOC

This study employs a research tool that has been meticulously designed and validated to ensure its content validity. The research tool used in this study was meticulously designed and validated to ensure its content validity. This rigorous validation process was independently conducted by a panel of three esteemed experts, who each assessed the applicability of the tool in measuring the intended construct. Their consensus confirmed the high quality and relevance of the tool, thereby laying a solid foundation for determining the IOC values. The researcher has found that the quality of the tool is content validity by all three experts, to determine the IOC value.

Data Collection

1. This questionnaire was distributed to a sample of 154 students from the School of Physical Education at Guangdong Comprehensive University.

2. Interview form. This study used semi-structured interviews to interview a sample of 7 teachers and associate professors from Guangdong Comprehensive University to collect data.

During the interview, Researchers use tools such as mobile phones. To record the audio content to ensure that no information was missed during the interview process. When the interview ends, the researchers will convert the audio material to text format to facilitate organization and analysis in future work.

3. Collect data, including questionnaires and interviews, to analyze and rank success factors in physical education.

4. Using the Delphi method to draft success factors by 17 experts.

5. Create a Connoisseurship of 9 experts to confirm the success factors of physical education learning in a university.

Results

Interview expert

In this study, the Delphi method was used to collect opinions on the key factors affecting the academic performance of college students majoring in physical education after two rounds of expert consultation. The experts who participated in the interview came from different universities and research institutions, covering a variety of research fields, including physical education, sports psychology, exercise physiology, sports health management, sports sociology, etc. They not only have rich teaching experience but also have accumulated profound academic achievements in their respective fields.

A professor from Guangdong University of Sport pointed out: "Aiming at the differences in physical fitness of different students, PE teaching should adopt personalized training programs to improve the overall quality of students." "Items such as swimming, orienteering, and aerobics can be added to physical education to promote the all-around development of students' physical functions and qualities," he suggested.

Li, an associate professor at South China Normal University, stressed the importance of mental health: "While improving students' academic performance, attention should also be paid to students' mental health. Through scientific psychological intervention, students can better cope with the challenges in sports learning." She believes that the establishment of a sound mental health investigation and intervention system is very important for the long-term development of students.

A professor from Guangzhou University said, "The improvement of sports management and service facilities is a prerequisite for students to achieve good sports results. Schools should ensure that venues and equipment are maintained so that lack of or damage to facilities will not negatively affect the training of students."

A professor of the Guangdong Institute of Sports Science suggests different training plans for students with different physical qualities. "For example, for heavier students, proper aerobic training should be used to help them control their weight while improving lung capacity."

Professor of Guangdong Pharmaceutical University adds, "We should not only pay attention to the improvement of students' physical fitness, but also strengthen the all-round management of students' sports health, from diet, sleep to mental health, with scientific guidance." He pointed out that because different students have different physical functions and physical qualities, what works for one student may not work for others. Therefore, in teaching, we still emphasize specific analysis of specific problems and teaching by aptitude. He suggested that the comprehensive development of swimming, orienteering, aerobics, and other entertainment and exercise, as of sports, is conducive to the improvement of students' function and physical quality.

A researcher at the Guangdong Youth Sports Research Institute also stresses the close relationship between academics and physical fitness. "Students' physical health has a direct



impact on their academic performance, and schools should enhance students' physical fitness by increasing extracurricular sports activities," she said.

"Teaching content should be designed closer to students' needs, taking into account their interests and abilities, to improve engagement and learning effectiveness," said Ma, an associate professor at Huizhou University.

Professor of Guangdong University of Finance and Economics said: "Teachers' guidance methods and attitudes have a significant impact on students' motivation to learn. Teachers should actively guide students to participate in sports activities."

Professor of Sun Yat-sen University added: "The combination of research and teaching can provide students with richer physical education curriculum resources to help them improve their skills in practice."

Summary interview

Through this expert interview, the research draws several key conclusions. Experts generally agree that personalized teaching is the core factor affecting students' sports performance. Education should adopt a training program tailored to students' physical fitness and health status to ensure that each student can achieve the best development under the conditions that suit them. In addition, mental health is equally recognized as an important component of a student's athletic and academic success. Experts agree that a comprehensive mental health support system is critical to improving overall student performance.

Good sports facilities and scientific management systems are also believed to have a direct impact on students' sports performance. Experts stressed that schools should continue to invest in the maintenance and upgrading of facilities to create an environment that stimulates students' interest in participation. Finally, the goal of physical education should go beyond simply improving skills and should be committed to promoting students' all-around quality development, including physical quality, mental health, and social adaptability. These conclusions provide a solid theoretical basis for the construction of the subsequent index system.

To survey success factors that affect major physical education university students' physical education achievement, with 154 students

Discussion

The success of physical education (PE) is influenced by a complex interplay of various factors, including personal, service and environment, teaching, social and cultural, teacher, and academic achievement factors. These elements interact to significantly impact students' learning outcomes in PE. The research papers reviewed provide valuable insights into how these factors contribute to the effectiveness of PE programs and student success.

1. Personal Factor. Personal factors such as Body Mass Index (BMI), physical fitness, and learning motivation are crucial in determining PE learning outcomes. Notably, learning motivation has been identified as a dominant factor, accounting for a significant portion of the variance in learning outcomes (Firdaus et al., 2023). This finding aligns with previous literature that emphasizes





the importance of motivation in educational settings. Additionally, self-efficacy and individual interest also influence students' engagement and success in PE, affecting both motivation and the ability to overcome challenges in learning environments (Masrun & Rusdinal, 2022; Bautista et al., 2023). However, unlike some studies that suggest intrinsic motivation is the sole driver of engagement (Ryan & Deci, 2000), this research highlights the multifaceted nature of motivation in PE.

2. Service and environmental factors. The availability and quality of learning environment facilities, including physical and digital resources, are essential for successful PE instruction. These facilities support the delivery of PE programs and enhance students' learning experiences (Margario et al., 2022; Ahmadi et al., 2022). This perspective is consistent with prior research that underscores the role of infrastructure in educational success. Furthermore, the social environment—encompassing peer interactions and support—mediates the impact of physical and digital environments on creating active school settings. This finding contrasts with earlier studies that focused predominantly on physical resources without considering social dynamics.

3. Teaching Factors. Effective teaching methods and activities are critical for successful PE programs. The personality and teaching style of PE instructors significantly influence student engagement and learning outcomes (Boonsem & Chaoensupmanee, 2020). This aligns with existing literature that highlights the importance of teacher-student relationships in fostering engagement. Interventions targeting psychomotor, cognitive, affective, and social learning outcomes have shown varying degrees of effectiveness; notably, psychomotor outcomes were most positively impacted (Dudley et al., 2022). This finding supports previous assertions that physical skills are foundational to PE success but diverges from studies suggesting equal emphasis on cognitive aspects.

4. Social and Cultural Factors. Social and cultural contexts—including family and societal influences—shape students' attitudes towards PE and their levels of engagement. These factors can either facilitate or hinder the development of a positive attitude towards physical activity (Cheng, 2023). This observation resonates with research indicating that cultural expectations significantly affect participation in physical activities. However, unlike some studies that focus solely on familial support, this research emphasizes a broader range of societal influences.

5. Teacher Factors. The personality and effectiveness of PE teachers are pivotal in delivering quality education. Teachers who can engage students and adapt their teaching methods to meet diverse needs are more likely to foster positive learning outcomes (Boonsem & Chaoensupmanee, 2020). This finding corroborates earlier work emphasizing the necessity for teacher adaptability in varied educational contexts. Moreover, teacher training and professional development are essential to equip educators with the skills needed to address diverse factors influencing PE success.

6. Academic Achievement Factors. Academic achievement in PE is not solely dependent on physical abilities but also on cognitive and affective learning outcomes. Interventions addressing these domains can enhance overall student success in PE (Dudley et al., 2022). This aligns with





existing literature advocating for an integrated approach to education that combines academic and physical education goals (Cheng, 2023). However, it contrasts with some studies that prioritize physical competence as the primary measure of success in PE.

While these factors collectively contribute to the success of PE programs, it is crucial to recognize that their interplay can vary based on individual and contextual differences. For instance, personal motivation may have a more pronounced impact in resource-limited environments, whereas teaching effectiveness might be a stronger determinant in well-equipped settings. Understanding these dynamics can help educators and policymakers design more effective PE programs tailored to specific needs and contexts.

Conclusion

The objective of this was to study the key success factors that affected the achievements of major physical education university students' success in physical education.

Methodology: This research was a mixed-methods research that involved a four-phase process: 1) Literature review of success factors on learning achievement. 2) Deep interviews with five experts to identify key success factors. 3) To survey. 4) Connoisseurship evaluation by seven experts to assess the suitability and feasibility of the Key success factors. Data analysis was computed with the mean and standard deviation.

The study identified key success factors influencing university students' achievements in physical education, categorized into personal, service and environmental, teaching, social and cultural, teacher factors, and academic achievement. There were six key success factors and 33 indices. Key success factors include: 1) Personal factors (7 indexes) consist of attendance and engagement and attitude, and preparation. 2) Service and environmental factors (7 indexes) consist of facilities, resources, and support services. 3) Teaching factors (6 indices) consist of instructional design and delivery and assessment, and support. 4) Social and cultural factors (9 indices) consist of social influences, cultural influences, and organized sports. 5) Teacher factors (8 indices) consist of the teacher's expertise and approach, the teacher's support and interaction, and the teacher's influence on students. and 6) Academic achievement (6 indices) consists of performance and progress, motivation and goals, and resources and support.

This research highlights the multidimensional factors impacting student achievements in physical education and provides insights for improving program effectiveness.

Recommendation

From this research

1. Enhance Mental Health Support. Higher education institutions should establish comprehensive mental health systems, offering professional counseling, educational activities, and emergency interventions. These measures help students manage stress, improve emotional regulation, and excel academically and in sports.





2. Optimize Resources & Services. Schools must invest in facility upgrades and software support, like mentoring, career counseling, and health programs, to meet personal growth needs. This dual approach supports academic pursuits and overall development.

3. Innovate Teaching & Foster Interaction. Adopt student-centered teaching strategies that encourage active learning and critical thinking. Regularly update content to align with current research and industry practices. Strengthen teacher-student interaction by actively listening to feedback and providing effective guidance to facilitate learning progress. Additionally, develop soft skills such as social abilities, leadership, and teamwork for holistic development.

For the next research

1. In-depth discussion on the interaction between external support and students' subjective initiative. Future research should further explore how the interaction between external support (e.g., teacher guidance, school resources) and student agency (e.g., learning attitude, effort, time management) affects academic achievement. By analyzing this interaction in depth, we can better understand how to optimize educational resources and teaching methods to stimulate students' potential and improve their performance.

2. Develop individualized educational intervention strategies. Based on the multi-dimensional factors identified, future research can develop personalized intervention strategies tailored to each student's specific needs and strengths, providing targeted support and guidance to enhance academic achievement. Implementing these personalized strategies can help more students overcome challenges and achieve their goals.

3. Long-term follow-up research. To verify the stability and reliability of the study's conclusions, future research should conduct long-term follow-ups. By continuously observing and analyzing the same group of students at different time points, we can more accurately assess the long-term impact of key success factors on academic achievement. Additionally, long-term research can reveal changing trends and potential issues, offering valuable feedback and suggestions for educational practice.

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