

GOOD HEALTH EDUCATIONAL MANAGEMENT STRATEGIES FOR
ENHANCING SUSTAINABLE SPORTS PARTICIPATION OF
UNDERGRADUATE STUDENTS

YANG XIAODAN

A thesis paper submitted in partial fulfillment of the requirements for the Degree of
Doctor of Philosophy Program in Educational Management for Sustainable Development

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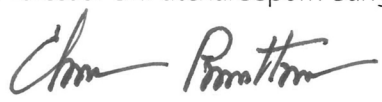
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Thesis Title Good Health Educational Management Strategies for Enhancing Sustainable Sports Participation of Undergraduate Students

Author Mrs.Yang Xiaodan

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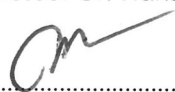

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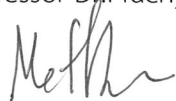
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Title	Good Health Educational Management Strategies for Enhancing Sustainable Sports Participation of Undergraduate Students
Author	Yang Xiaodan
Program	Education Management for Sustainable Development
Major Advisor	Assist.Prof. Dr. Phatchareephorn Bangkheow
Co-advisor	Associate Professor Dr. Chollada Pongpattanayothin
Co-advisor	Assistant Professor Dr. Phisanu Bangkheow
Academic Year	2025

ABSTRACT

The objectives of this research were 1) to study current conditions, desired conditions that enhance sustainable sports participation of undergraduate students, 2) to develop good health educational management strategies for enhancing sustainable sports participation of undergraduate students, and 3) to evaluate the feasibility and adaptability of the strategies for enhancing sustainable sports participation of undergraduate students. The sample group of this research consisted of 384 students for questionnaires, 16 teachers and education administrators for interview, 12 experts for focus group discussion, and 5 experts for strategies evaluation. The students were sampled through stratified random sampling, while others were selected by purposive sampling. The research instruments included questionnaires, interviews, SWOT and TOWS matrices for strategy development, and evaluation form. The statistics used to analyze the data were percentages, mean, standard deviations, Modified Priority Needs Index (PNI modified), and content analysis.

The results revealed the following: 1) The current conditions, desired conditions and factors supporting the enhancement of undergraduate students' sustainable sports participation were examined through eight dimensions: Education and Knowledge, Campus Environment, Health and Awareness, Living Habits, Time Management, Incentive and Club, Psychology and Stress and Family Influence, and all

these aspects need to be developed. 2) The strategies for enhancing sustainable sports participation of undergraduate students consisted of visions, missions, goals, 10 strategies and measures, as follows: (1) Strategies for Collaborative Mechanism of Stakeholders, (2) Strategies for Construction of Incentive and Club Ecosystem, (3) Strategies for Improvement of Time Management, (4) Strategies for Establishment of Dynamic Risk Management System, (5) Strategies for Reconstruction of Family Support System, (6) Strategies for Regulation of Psychological Stress, (7) Strategies for Cultivation of Health Awareness, (8) Strategies for Innovation of Education and Knowledge System, (9) Strategies for Intervention in Living Habits, (10) Strategies for Optimization of Campus Environment. The adaptability and feasibility evaluation results of the strategies were in the highest and high levels, respectively.

Keywords: Good health educational management strategies, Sustainable sports participation, Undergraduate students

ชื่อเรื่อง	กลยุทธ์การจัดการศึกษาด้านสุขภาพที่ดีเพื่อส่งเสริมการมีส่วนร่วมในกิจกรรมกีฬาอย่างยั่งยืนของนักศึกษาระดับปริญญาตรี
ชื่อผู้วิจัย	หยาง เสี่ยวด้าน
สาขาวิชา	การจัดการศึกษาเพื่อการพัฒนาที่ยั่งยืน
อาจารย์ที่ปรึกษาหลัก	ผู้ช่วยศาสตราจารย์ ดร.พัชรินทร์ บางเขียว
อาจารย์ที่ปรึกษาร่วม	รองศาสตราจารย์ ดร.ชลลดา พงศ์พัฒนโยธิน
อาจารย์ที่ปรึกษาร่วม	ผู้ช่วยศาสตราจารย์ ดร.พิษณุ บางเขียว
ปีการศึกษา	2568

บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อ 1) ศึกษาสภาพปัจจุบัน และสภาพที่พึงประสงค์ เพื่อส่งเสริมการมีส่วนร่วมในกิจกรรมกีฬาอย่างยั่งยืนของนักศึกษาระดับปริญญาตรี 2) จัดสร้างกลยุทธ์การจัดการศึกษาด้านสุขภาพที่ดีเพื่อส่งเสริมการมีส่วนร่วมในกิจกรรมกีฬาอย่างยั่งยืนของนักศึกษาระดับปริญญาตรี และ 3) ประเมินความเป็นไปได้และความสามารถในการปรับใช้ของกลยุทธ์การจัดการศึกษาด้านสุขภาพที่ดีเพื่อส่งเสริมการมีส่วนร่วมในกิจกรรมกีฬาอย่างยั่งยืนของนักศึกษาระดับปริญญาตรี กลุ่มตัวอย่างในการวิจัยประกอบด้วย นักศึกษาจำนวน 384 คน สำหรับการตอบแบบสอบถาม อาจารย์และผู้บริหารด้านการศึกษา 16 คนสำหรับการสัมภาษณ์ ผู้เชี่ยวชาญ 12 คน สำหรับการสนทนากลุ่ม และผู้เชี่ยวชาญ 5 คนสำหรับการประเมินกลยุทธ์ โดยกลุ่มนักศึกษาได้รับการสุ่มตัวอย่างแบบแบ่งชั้น ส่วนกลุ่มอื่นใช้วิธีการสุ่มแบบเจาะจง เครื่องมือที่ใช้ในการวิจัย ประกอบด้วยแบบสอบถาม แบบสัมภาษณ์ เมทริกซ์ SWOT และ TOWS สำหรับพัฒนากลยุทธ์ และแบบประเมินกลยุทธ์ สถิติที่ใช้ในการวิเคราะห์ข้อมูล ได้แก่ ค่าร้อยละ ดัชนีความต้องการจำเป็น (PNI modified) ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และการวิเคราะห์เนื้อหา

ผลการวิจัยพบว่า 1) สภาพปัจจุบัน สภาพที่พึงประสงค์เพื่อการส่งเสริมการมีส่วนร่วมในกิจกรรมกีฬาอย่างยั่งยืนของนักศึกษาระดับปริญญาตรีสามารถจำแนกได้ใน 8 ด้าน ได้แก่ การศึกษาและความรู้ สภาพแวดล้อมในมหาวิทยาลัย สุขภาพและการตระหนักรู้ นิัยในการดำเนินชีวิต การบริหารเวลา แรงจูงใจและการเข้าร่วมกิจกรรมชมรม สภาวะจิตใจและความเครียด และอิทธิพลจากครอบครัว ซึ่งทุกด้านล้วนมีความจำเป็นต้องได้รับการพัฒนา 2) กลยุทธ์ที่จัดสร้างขึ้นเพื่อส่งเสริมการมีส่วนร่วมในกิจกรรมกีฬาอย่างยั่งยืนของนักศึกษาระดับปริญญาตรี ประกอบด้วย วิสัยทัศน์ พันธกิจ

เป้าหมาย กลยุทธ์ และมาตรการ รวม 10 ด้าน ได้แก่ (1) กลยุทธ์ด้านการสร้างกลไกความร่วมมือระหว่างผู้มีส่วนได้ส่วนเสีย (2) กลยุทธ์ด้านการจัดสร้างระบบแรงจูงใจและการเข้าร่วมกิจกรรมชมรม (3) กลยุทธ์ด้านการเสริมสร้างทักษะการบริหารเวลา (4) กลยุทธ์ด้านการจัดตั้งระบบบริหารความเสี่ยงแบบพลวัต และ (5) กลยุทธ์ด้านการสร้างระบบสนับสนุนจากครอบครัว (6) กลยุทธ์ด้านการจัดการความเครียดทางจิตใจ (7) กลยุทธ์ด้านการปลูกฝังจิตสำนึกด้านสุขภาพ (8) กลยุทธ์ด้านการสร้างนวัตกรรมการศึกษาและองค์ความรู้ (9) กลยุทธ์ด้านการสร้างเสริมพฤติกรรมนิสัยการใช้ชีวิต (10) กลยุทธ์ด้านการพัฒนาสภาพแวดล้อมในมหาวิทยาลัย 3) ผลการประเมินกลยุทธ์ในด้านความเป็นไปได้ และความสามารถในการปรับใช้ พบว่ากลยุทธ์เหล่านี้มีความเป็นไปได้ในการนำไปใช้ และ ความสามารถในการปรับใช้อยู่ในระดับสูงมาก และ สูงตามลำดับ

คำสำคัญ: กลยุทธ์การจัดการศึกษาด้านสุขภาพที่ดี, การมีส่วนร่วมในกิจกรรมกีฬาอย่างยั่งยืน, นักศึกษาระดับปริญญาตรี

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Chapter 1

Introduction

Rationale

Education played a crucial role in the all-round development of individuals and society. It was a catalyst for economic growth, social progress, and national modernization. The rapid evolution of the global education model not only emphasized academic excellence but also focused on the physical and mental health of students. Physical education and sports participation had become an indispensable part of the comprehensive education system. The United Nations Educational, Scientific and Cultural Organization emphasized in its "Guidelines for Physical Education and Sport in Schools" that physical education should be integrated into the core of comprehensive education to promote students' physical and mental development, which directly supports this view. This concept was highly in line with Sustainable Development Goal 3 (SDG 3) - ensuring healthy lifestyles and promoting the well-being of people of all ages. (UNESCO, 2019).

The United Nations (2015) explicitly stated in the "2030 Agenda for Sustainable Development" that SDG 3 aimed to "ensure healthy lives and promote well-being for all at all ages", and identified physical activity as a key intervention to achieve this goal. SDG 3 emphasized the importance of reducing non-communicable diseases and promoting mental health, and these goals could be achieved through regular physical exercise and sports participation. The World Health Organization further pointed out in its "Global Action Plan on Physical Activity 2018-2030" that "regular participation in sports and physical activity is one of the most cost-effective ways to prevent non-communicable diseases and improve mental health". Continuous sports participation could not only reduce the risk of diseases such as obesity, heart disease, and diabetes but also improve mental health, reduce stress, and promote social cohesion. Therefore, improving undergraduate students'

participation in sports is not only related to their personal health, but also directly contributes to the enhancement of public health, while responding to the requirements of Goal 3 of the Sustainable Development Goals (SDGs). (WHO, 2020).

At the international level, more and more countries and international organizations had recognized the importance of improving the physical health of adolescents and undergraduate students. The World Health Organization (WHO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) had long advocated preventing non - communicable diseases and improving mental health by increasing the physical activity of young people. Sports and physical education were regarded as an important part of a comprehensive education strategy and helped cultivate healthy and fitness habits throughout life. Educational institutions in various countries were implementing relevant policies aimed at establishing a health culture that went beyond the academic year by increasing students' sports participation. (WHO, 2020; UNESCO, 2019).

In China, in recent years, the importance attached to the physical health of adolescents and colleges students had been continuously strengthened. The Chinese government had issued a series of policy documents aiming to improve students' health levels through physical education. For example, the "Opinions on Strengthening Adolescent Sports and Enhancing Adolescent Physical Fitness" (2007) proposed that attention should be paid to adolescent sports, measures should be taken to enhance adolescent physical fitness, actively promote the implementation of the "National Student Physical Health Standards," and take students' physical health status as an important indicator for comprehensively measuring students' healthy development. The release of this policy showed China's policy orientation in promoting adolescent physical health. (Central Committee of the Communist Party of China and the State Council, 2007).

In addition, the "Opinions on Comprehensively Strengthening and Improving School Health and Health Education in the New Era" (2021) further required strengthening school sports and clearly stipulated that primary and secondary schools should ensure one hour of physical activity time every day. This policy

emphasized improving students' health literacy by increasing students' physical activity time and enhancing the systematization of school health education, and ensuring that health education became a part of educational evaluation reform. (Ministry of Education, 2021).

Furthermore, the "Opinions on Comprehensively Strengthening and Improving School Sports Work in the New Era" (2021) proposed that school sports was an important basic project for realizing the fundamental task of cultivating people with morality. It was necessary to accelerate the modernization of education, build a strong country in education and sports, and ensure that by 2022, physical education courses would be fully implemented and opened up, and students' physical fitness and comprehensive qualities would be significantly improved. By 2035, a diversified modern high - quality school sports system would be basically formed. (General Office of the CPC Central Committee, 2021).

Despite the continuous increase in policy support, undergraduate students still faced many challenges in maintaining sustainable sports participation. Research showed that academic pressure, insufficient facilities, lack of peer motivation, and mental health problems such as anxiety and depression were important factors that hindered undergraduate students from actively participating in sports activities. In addition, economic factors and cognitive biases about the value of sports further limited their participation. (China Youth Network, 2023; Xinhua News Agency, 2023).

Undergraduate students' mental health problems (such as anxiety and depression) seriously affected their willingness to participate in sports activities. Students with more serious psychological problems usually lacked the motivation and energy to participate in sports. Although sports activities were considered an effective way to relieve stress, they had not been widely recognized and applied. (Schultz & Leslie, 1988).

Smith and Johnson pointed out in their study on the sports participation of American undergraduate students that economic factors were an important reason affecting undergraduate students' participation in sports activities. High costs of sports equipment and gym membership fees posed obstacles to students with poor

economic conditions. In addition, insufficient time management ability was also an important factor for undergraduate students to give up sports activities. (Smith & Johnson, 2002).

Chinese undergraduate students had cognitive biases about sports, believing that sports wasted time or lacked understanding of the health benefits of sports activities, which led to their unwillingness to actively participate in sports activities. At the same time, lack of peer motivation and campus sports culture atmosphere were also important factors affecting undergraduate students' sports participation. (Zhang Yunhua, 2009).

The global health report released by the World Health Organization (WHO) (2020) pointed out that increasing the sports participation of adolescents and undergraduate students could effectively reduce the risk of non-communicable diseases and improve mental health. This study emphasized the importance of regular physical activity for the undergraduate student group and advocated that countries strengthen the policy implementation of youth sports activities. (World Health Organization, 2020).

Academic pressure was a key factor affecting Chinese undergraduate students' sports participation. As the difficulty of courses increased and exam pressure intensified, students often found it difficult to find a balance between learning and sports activities. In addition, the lack of school sports facilities and insufficient social support were also important reasons hindering undergraduate students' sports participation. The above research revealed various factors that affected undergraduate students' sustainable sports participation. Taken together, these studies indicated that to effectively enhance undergraduate students' sports participation, health education management strategies needed to make efforts in multiple aspects, including alleviating mental health problems, reducing economic and time barriers, enhancing the understanding of sports, and improving sports facilities and campus cultural atmosphere. The formulation and implementation of these strategies would help promote undergraduate students' sustainable sports

participation, echoing the necessity of health education management strategies in the research topic. (Xu Wenxin, 2024).

Solving these problems required effective health education management strategies to promote sustainable sports participation. These strategies could be achieved by increasing students' awareness of the benefits of sports activities, providing convenient opportunities for sports participation, and integrating sports into the education framework. In addition, using digital technology and the Internet to provide digital fitness programs could increase the attractiveness of sports and stimulate students' interest in participation.

This study aimed to study the current situation and ideal state of sustainable sports participation of undergraduate students, develop health education management strategies to enhance undergraduate students' sports participation, and evaluate the feasibility and adaptability of these strategies in different educational environments. These strategies were crucial for promoting long-term health benefits and echoing the goals of SDG 3 to ensure that students not only achieved academic success but also led a healthier and more active life.

In conclusion, strengthening good health educational management strategies to promote sustainable sports participation of undergraduate students was not only a key means to promote students' physical health and all-round development but also closely related to improving public health and achieving sustainable development goals.

Research Questions

1. What was the current conditions, desired conditions, that enhance sustainable sports participation among undergraduate students?
2. What were the good health educational management strategies for enhancing sustainable sports participation among undergraduate students?
3. What were the level of feasibility and adaptability of the good health educational management strategies for enhancing sustainable sports participation among undergraduate students?

Research Objectives

1. To study the current conditions and desired conditions that enhance sustainable sports participation among undergraduate students.
2. To develop good health educational management strategies for enhancing sustainable sports participation among undergraduate students.
3. To evaluate the feasibility and adaptability of the good health educational management strategies for enhancing sustainable sports participation among undergraduate students.

Scope of the Research

This research was divided into three phases:

Phase 1: Studying the current conditions and desired conditions that enhance sustainable sports participation among undergraduate students.

Phase 2: Developing good health educational management strategies for enhancing sustainable sports participation among undergraduate students.

Phase 3: Evaluating the feasibility and adaptability of the proposed health educational management strategies in promoting sustainable sports participation among undergraduate students.

Phase 1: Studying the current conditions and desired conditions that enhance sustainable sports participation among undergraduate students.

Population

Population consisted of 47.63 million undergraduate students currently enrolled in 1,308 colleges and universities across China, according to the data information of the Ministry of Education of China as of June 20, 2024, aiming to understand their level of sports participation.

The Sample Group

This research used stratified random sampling, the sample size according to Krejcie and Morgan's table (1970), resulting in a sample size of 384 students from 10 colleges and universities in different regions and of different types were selected as

samples. The current conditions, desired conditions of sports participation of undergraduate students was studied through questionnaire surveys.

Target Group

The target group was selected by purposive sampling, 16 physical education teachers and educational administrators were selected as interview objects. The selection criteria were as follows: Currently enrolled undergraduate students who have regularly participated in physical activities in the past year. The selection criteria for interview experts were as follows: (1) Possess a master's degree or above. (2) Have worked in institutions of higher education for more than 10 years. (3) Be expert scholars with rich experience in the fields of educational management, physical education, or psychological research on undergraduate students, and have in-depth research and understanding of undergraduate students' sports participation.

Phase 2: Developing good health educational management strategies enhancing sustainable sports participation of undergraduate students.

Target Group

Twelve experts participated in focus groups to develop educational management strategies that can enhance the sustainable sports participation of undergraduate students.

The target group was selected by purposive sampling. The selection criteria for interview experts were as follows: (1) Master's degree or above. (2) Have worked in colleges and universities for more than 10 years. (3) Directors and deputy directors of the physical education department and responsible persons of relevant departments, and had in-depth research and understanding of undergraduate students' sports participation.

Phase 3: Evaluating the feasibility and adaptability of the Good health educational management strategies in enhancing sustainable sports participation among undergraduate students.

Target Group

Five experts evaluated the feasibility and adaptability of the formulated educational management strategies.

The criteria for selecting key informants by purposive sampling were as follows: (1) Had held senior management positions in universities for at least 10 years and had rich management experience. (2) Had a profound professional background in educational management, physical education or related fields. (3) Held a doctorate degree and had a solid theoretical foundation. (4) Their academic title was associate professor or above, and they had a relatively high academic status and influence.

The Variable

Independent Variables

Good Health Educational Management Strategies

Dependent Variable

Sustainable Sports Participation of Undergraduate Students

Content

1. Studying the current conditions and desired conditions that enhance sustainable sports participation of undergraduate students, focusing on eight key dimensions: educational and knowledge dimension, campus environment dimension, health and awareness dimension, living habits dimension, time management dimension, incentive and club dimension, psychology and stress dimension, family influence dimension.

2. Developing good health educational management strategies to enhance sustainable sports participation among undergraduate students, we used SWOT Analysis, TOWS Matrix Analysis, expert interviews, and focus-group discussions.

3. Evaluating the feasibility and adaptability of the good health educational management strategies in various educational settings to ensure they effectively enhance sustainable sports participation among undergraduate students.

Time

The research period is from September 2024 to November 2025 and is divided into the following stages:

1. Submitted the first three chapters of the proposal and defended it in September 2024.

2. Conducted research questionnaire surveys and literature reviews to understand the current situation of domestic and foreign colleges and universities in educational management, physical education teaching, undergraduate students' sports and other aspects to improve undergraduate students' sports participation from September 2024 to October 2024.

3. Developed strategies to improve undergraduate students' employability, and invited experts to evaluate the feasibility and adaptability of these strategies from November 2024 to May 2025.

4. Summarizing the research results, completing the thesis, and publishing the thesis in July 2025.

Advantages

Combining the theme of this research on "Good Health Education Management Strategies for Enhancing Sustainable Sports Participation of undergraduate Students", the following were the advantages of this research elaborated in detail from three aspects: schools, teachers, and students:

1. For students: This research enabled students to gain a clearer understanding of their own sports participation patterns and make improvements. The proposed strategies brought more opportunities and resources for sports participation, improved students' physical fitness, teamwork spirit, stress resistance ability, and academic performance, and laid a foundation for their future development.

2. For teachers: Teachers optimized teaching through this research to better meet students' needs. The strategies provided innovative teaching ideas and improved the quality of physical education. The increased student participation created a more positive classroom atmosphere and increased teachers' job satisfaction.

3. For schools: This research helped schools improve educational management by enabling them to understand the current situation and ideal conditions of students' sports participation. It allowed for more effective resource

allocation and created a positive sports culture atmosphere. The enhanced sports atmosphere improved the school's reputation, attracted high-quality students, and enhanced the school's competitiveness.

Definition of Terms

Good Health Education: referred to a comprehensive educational process centered on enhancing health literacy, well-being, and healthy behaviors, with core characteristics including clear alignment with learners' needs, comprehensive content covering physical, mental, and social health, delivery by skilled educators capable of stimulating participation enthusiasm through teaching methods, sufficient institutional support facilitating access to extracurricular health knowledge, digital adaptability, and rigorous management systems. It aimed to boost health awareness, cultivate sustainable healthy lifestyles, and enhance overall well-being to underpin long-term sports participation.

Strategy: referred to a comprehensive educational process centered on enhancing health literacy, well-being, and healthy behaviors, with core characteristics including clear alignment with learners' needs, comprehensive content covering physical, mental, and social health, delivery by skilled educators capable of stimulating participation enthusiasm through teaching methods, sufficient institutional support facilitating access to extracurricular health knowledge, digital adaptability, and rigorous management systems. It aimed to boost health awareness, cultivate sustainable healthy lifestyles, and enhance overall well-being to underpin long-term sports participation.

Sustainable sports participation: referred to long-term, continuous engagement in sports activities by undergraduates, integrating multiple dimensions: campus environment adaptability, which was supported by attractive sports activities, complete facilities, and a strong sports atmosphere; incentive and club integration, which was maintained through a sense of gain from club activities, effective incentive mechanisms, and skill improvement via club training; time management balance, which alleviated exercise time extrusion and enhanced exercise experience under

existing time patterns; psychological and family support, which was sustained by exercise's stress-relief effect, family sports support, and family health concept guidance; and technological and behavioral synergy, which was facilitated by digital tools and healthy living habits. It balanced these aspects to enable steady long-term sports involvement.

Undergraduate Students: referred to individuals pursuing bachelor's degrees in higher education institutions, whose good health and well-being involves three interconnected dimensions-Physical Wellbeing sustained through sustainable sports participation (long-term sports involvement supported by a favorable campus environment, incentives, balanced time management, and tech-integrated healthy habits), Mental Wellbeing fostered by exercise's stress relief and good health education (with mental health content via engaging educators) to build health awareness and lifestyles, and Social Wellbeing nurtured through social integration via health education (with social health content), a sense of belonging from sports clubs, and family support/health guidance-all interacting to shape their overall well-being and underpin holistic development.

Conceptual Framework

The conceptual framework of this study centered on the core relationship between two key variables: Good Health Educational Management Strategies (independent variable) and Sustainable Sports Participation of Undergraduate Students (dependent variable). These variables were interconnected through eight intermediate dimensions-educational and knowledge, campus environment, health and awareness, living habits, time management, incentive and club, psychology and stress, and family influence-which served as the mechanisms through which the independent variable exerted its impact on the dependent variable. The relationships among these variables were derived from theoretical foundations, empirical findings, and policy contexts, as conceptual framework below:

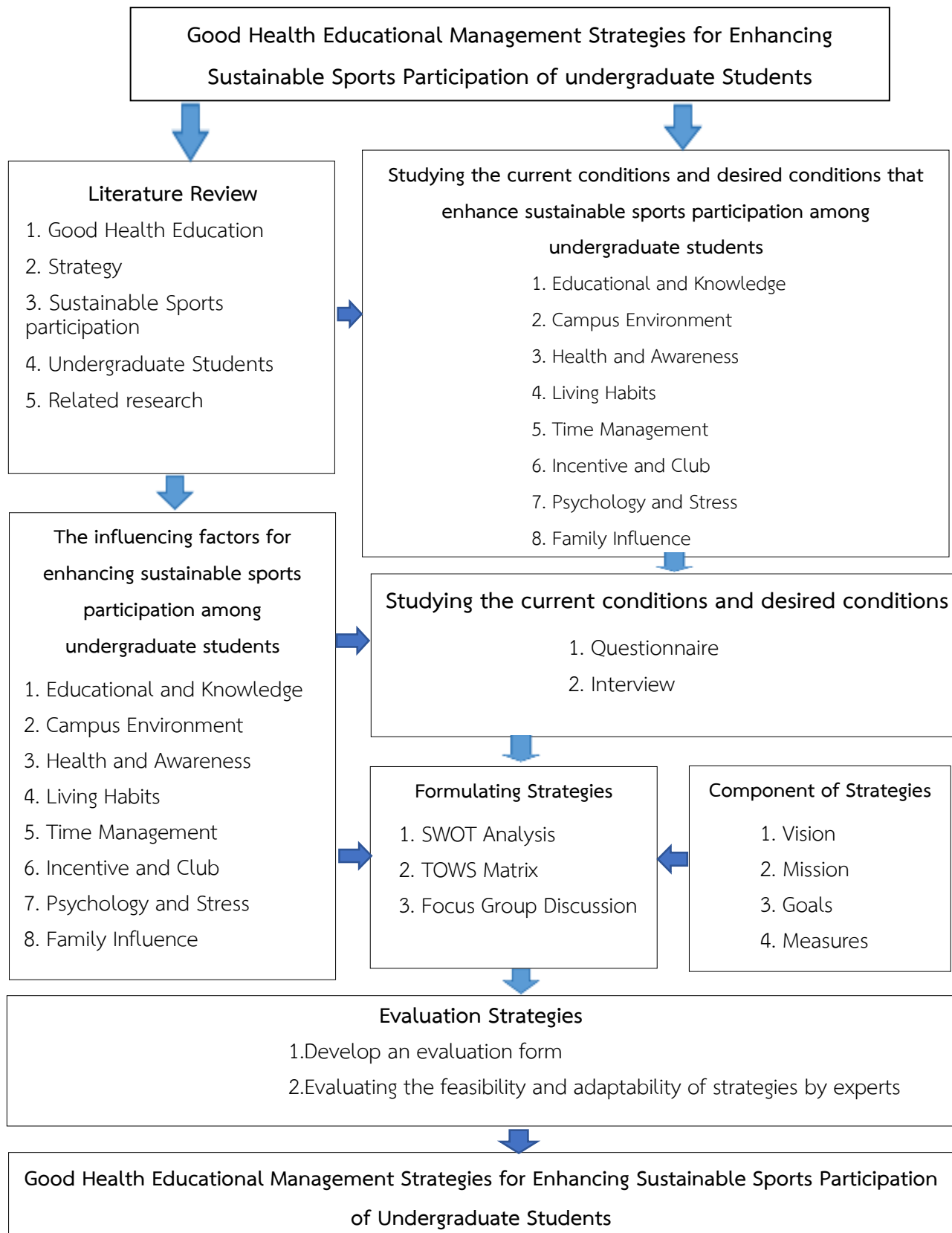


Figure 1.1 Conceptual Framework

Chapter 2

Literature Review

For the research on “Good health educational management strategies for enhancing sustainable sports participation of undergraduate students”, the researcher analyzed literature, concepts, theories, and research related to educational management and sports participation. The details were as follows:

1. Good Health Education Management
2. Strategy
3. Sustainable Sports Participation
4. Undergraduate Students
5. Related Research

Good Health Education Management

Good health education management served as the cornerstone in promoting undergraduate students' sustainable sports participation, acting as the guiding force that aligned educational efforts with the overarching goals of enhancing students' health awareness and fostering active engagement in sports. The details were as follows:

Definition of Good Health Education

Research literature highlights several key aspects that define good health education, derived from analyses of its essential components, characteristics, and requirements. These perspectives collectively shape our understanding of what constitutes effective and high-quality health education:

Ru (2024) emphasized that good health education must have a sound content management system and clear, measurable, and targeted educational goals. These goals should guide the direction of health education programs, ensuring they address the specific needs of students and enhance the effectiveness of the content. Additionally, it should adopt modern management methods for content resource.

Li Hui (2023) stated that good health education refers to health education management that features a comprehensive and up-to-date content system. This system should leave no gaps in critical areas, such as integrating mental health education (including stress management and emotional intelligence development) into the overall curriculum. Furthermore, its content and delivery methods must keep pace with the times, addressing new health trends, technologies, and emerging risks—for example, incorporating information on telemedicine, wearable health devices, and other modern health innovations.

Jin (2023) noted that good health education is characterized by being fully recognized as essential by educational institutions, which translates into sufficient investment in developing diverse educational materials. It must be prioritized in the overall curriculum, ensuring it receives adequate time and resources without being diluted or replaced by other curricular elements. Strong policies and enforcement are integral to safeguarding its importance.

Du (2021) highlighted that good health education refers to a health education system adapted to the digital age. While students now access health information from diverse sources outside school, educational institutions should maintain a central role in disseminating reliable knowledge by creating relevant, engaging content. This requires content developers to possess strong digital skills, enabling them to design interactive modules, multimedia resources, and online platforms that meet modern educational needs.

Li (2020) stressed that good health education is designed by professionals with high-quality expertise, including knowledge of health promotion theories, health communication, and culturally specific health needs. It also requires sufficient investment in research, content creation, and updates, supported by flexible, innovative development methods and mechanisms that respond to evolving health trends and student needs.

Li Li (2019) added that good health education refers to a health education system that relies on a robust content management system, featuring consistent standards, regular review and updates, and effective evaluation methods. Its content

and delivery must reflect current issues-such as the impact of social media on mental health and environmental health-and avoid outdated materials or teaching approaches.

To sum up, within this research, good health education referred to a comprehensive educational process centered on enhancing health literacy, well-being, and healthy behaviors, with core characteristics including clear alignment with learners' needs, comprehensive content covering physical, mental, and social health, delivery by skilled educators capable of stimulating participation enthusiasm through teaching methods, sufficient institutional support facilitating access to extracurricular health knowledge, digital adaptability, and rigorous management systems. It aimed to boost health awareness, cultivate sustainable healthy lifestyles, and enhance overall well-being to underpin long-term sports participation.

Concept of Educational Management

There were many experts who had discussed research on educational management. As follows were the representative literatures selected by this study:

Huang Bing (2024) believed that the concept of undergraduate education management from the perspective of lifelong education should focus on the continuous learning and development of students. Through the reform and innovation of the lifelong education management system, diversified learning opportunities were provided to meet the learning needs of students at different stages of life and promote their all - round development.

Tong Yifeng (2023) believed that the education management of undergraduate students in the era of "Internet +" needed innovative concepts. By integrating Internet technology into education management to improve management efficiency and students' autonomous learning ability, managers should build an information - based and intelligent education management model and pay attention to students' individualized needs and all - round development.

Quintero (2023) believed that the empirical research paradigm of western education management emphasized the data - driven management concept and focused on verifying and optimizing education management practices through

scientific research and empirical data to improve the effectiveness and reliability of management decisions. This concept advocated systematically improving the level of education management based on data.

Cai Jieru (2022) believed that the education management concept in the era of artificial intelligence should have both technology and humanistic care. Although AI technology could improve the efficiency and accuracy of education management, managers must also pay attention to moral and ethical issues to ensure that the application of technology was in line with the fundamental goal of education development, that is, to promote the all - round development of students.

Huang Yongjun (2022) believed that the concept of "four appropriateness" in education management emphasized the coordination and rationality of management activities. This concept required managers to comprehensively consider multiple factors such as the internal laws of education, social needs, student individuality and educational environment in the decision-making process to achieve the effectiveness and adaptability of education management.

Kirkcaldy (2002) believed that the concept of higher physical education management in China needed to pay attention to three levels: policy, culture and system. By strengthening policy support, optimizing the management system and enriching campus sports culture, ensured the modernization and internationalization development of physical education to cultivate sports talents with global competitiveness.

Pialkien (2019) believed that the education management of sports activities should pay attention to students' internal and external motivation. Managers needed to stimulate students' interest and participation through incentive measures to promote extensive participation and persistence in sports activities.

Girginov (2008) believed that the concept of postgraduate education management in sports disciplines in China should focus on internationalization and practicality. By learning from advanced foreign education management experience and strengthening the combination of theory and practice, cultivated sports professionals with international vision and innovation ability.

The concept of education management focused on relying on scientific and systematic management practices, optimizing resource allocation, improving teaching quality, and promoting the all-round development of students. At that time, education management needed to focus on the application of information technology, individualized teaching, and diversified evaluation to adapt to social development. The concept of physical education management should have taken the all-round development of students as the core, and enhanced students' physical fitness and teamwork ability through reasonable planning of sports activities and management strategies. The key lay in stimulating students' internal motivation, providing diverse participation opportunities and support, and cultivating lifelong sports habits and comprehensive qualities. Managers should have integrated policies, cultures, and technologies to build a flexible and diverse physical education model, stimulated students' interest and enthusiasm in sports participation, and achieved sustainable development.

Good Health Promotion in Education

Within the framework of good health promotion in education, robust health education content spans diverse dimensions that are pivotal to enhancing undergraduate students' comprehension of health and its intricate connection to sports participation, serving as a foundational element in fostering their holistic well-being and sustained engagement in healthy lifestyles.

Kuang (2023) noted that healthy behaviors stem from strong health beliefs and motivations, which lays a foundation for understanding Good Health Promotion in Education. This concept encompasses a comprehensive framework integrating strategies, environments, and curricula to foster holistic well-being across all educational stages. It goes beyond mere disease prevention, aiming to cultivate lifelong healthy behaviors, equitable access to health resources, and supportive ecosystems where learners, educators, and communities thrive. At its core, it recognizes well-being as a multifaceted state-encompassing physical, mental, emotional, and social dimensions-with educational institutions playing a pivotal role

as primary settings for nurturing this balance by actively shaping the foundations of health beliefs.

Quo (2023) highlighted that health behaviors are influenced by socioeconomic background, cultural values, and personal attitudes, emphasizing equity as a cornerstone of effective health promotion in education. Educational systems must address disparities through inclusive strategies: offering low-cost or free health resources (e.g., school meal programs, affordable sports equipment) for underserved communities, and integrating culturally relevant health practices (e.g., traditional movement forms, community-based wellness rituals) into curricula to resonate with diverse learner groups, ensuring no one is left behind in health promotion efforts.

Gu (2020) demonstrated that regular physical activity enhances cardiovascular health, muscle strength, and mental resilience across ages, making it a key lever in health promotion within education. Within a broader health promotion lens, physical activity is framed as part of a cohesive lifestyle. This translates to intentional design of physical education (PE) curricula, recess policies, and active learning strategies (e.g., movement breaks in classrooms) that make activity a natural part of the school day, rather than an optional add-on, maximizing its health benefits for learners.

Guo (2020) found that physical activity alleviates stress and anxiety by boosting endorphins, underscoring the integral role of mental health in health promotion in education. Beyond physical activity, mental health promotion extends to embedding social-emotional learning (SEL) into lessons, training educators to recognize signs of distress, and creating safe spaces for dialogue. This holistic approach helps learners develop coping skills, fostering not just academic success but emotional resilience, which is vital for overall well-being.

Wan (2012) emphasized that education enhances understanding of healthy practices, highlighting the importance of building health literacy in health promotion in education. This involves equipping learners with knowledge to make informed decisions, such as teaching proper exercise techniques, nutrition basics, and how to evaluate health information critically. By integrating health literacy into science,

home economics, and even math (e.g., tracking fitness goals), education becomes a tool for lifelong health, empowering learners to take charge of their well-being.

Ayer (2012) advocated for varied formats in health education to better meet diverse needs, which applies to diversified methods in health promotion in education. These methods are essential to engage diverse learners, such as interactive workshops on healthy cooking, peer-led fitness challenges, or digital tools (e.g., apps for tracking sleep). By aligning with different learning styles, health promotion becomes accessible and engaging, increasing its effectiveness in educational settings.

Pete (2011) stressed regular evaluation and adjustment of health education strategies, indicating that health promotion in education requires adaptive, evidence-based strategies. Schools must continuously assess and update policies, incorporating new research (e.g., emerging insights on screen time or mental health) and involving stakeholders (students, parents, community partners) in decision-making. This ensures that health promotion remains relevant and effective, adapting to the evolving needs of the educational community.

In summary, good health promotion in education, as supported by various research, is a systemic, equitable, and learner-centered approach. By integrating curricula, environments, and community partnerships, education becomes a powerful force for fostering holistic well-being-empowering learners of all ages to lead healthy, fulfilling lives.

Educational Management for Good Health

Regarding educational management for good health, various studies and organizations have put forward insights that highlight its significance, as follows.

World Health Organization (WHO) (2023) stated that individuals with a higher level of education are more likely to avoid smoking and have a deeper understanding of nutrition, exercise, and mental health. They emphasized that education helps to enhance the awareness of diseases, vaccines, and preventive healthcare, thereby reducing mortality rates. For example, they mentioned that

educated women are more inclined to seek maternal healthcare services, which is beneficial to both mothers and children.

Zhang (2019) argued that education and health are closely linked. They stated that a good educational background helps to enhance one's occupational and social status, bringing better living conditions and medical security. They also indicated that education can improve people's cognition and understanding of health knowledge, help them cultivate an optimistic and positive attitude, and enhance their ability to cope with stress and challenges. Moreover, they mentioned that from childhood, there is a connection between educational opportunities and health improvement, with early educational opportunities having a long - term impact on health in adulthood.

Huang Haojie (2018) pointed out that mental health issues are often overlooked in the education industry. They suggested that schools can effectively manage mental health problems by conducting mental health education for faculty, staff, students, and parents, encouraging open communication, implementing mental health policies and procedures, creating a supportive environment, and seeking professional help. This, they noted, can create a safe, healthy, and supportive learning and working environment for students, faculty, and staff.

Dong Lisheng (2011) observed that with the rapid development of educational informatization and the high utilization rate of electronic products among student groups, students' health problems have become increasingly prominent. They stated that the excessive use of electronic products has a negative impact on students' health and learning ability. To solve this problem, they proposed that it is necessary to establish the educational concept of putting health first, implement policies for protecting students' health, strengthen public opinion publicity, enhance the main responsibilities of schools, teachers, and parents, improve students' own health awareness and literacy in using electronic products, strengthen the social responsibility of electronic product production and sales departments, and strengthen the dynamic monitoring and evaluation of students' health literacy.

Gupta (2010) noted that the strong evidence regarding whether there is a causal relationship between education and health is rather mixed. However, they indicated that some studies do show education has a positive impact on health from either a direct or intergenerational perspective. In Nordic countries, although the evidence is inconsistent, it is reasonable to assume that education has the potential to affect health, but the exact benefits may depend on specific contexts and types of education. Additionally, they pointed out that existing studies do not support the view that child - centered progressive educational methods can improve the types of achievements closely related to self - assessed health; traditional teaching methods are relatively more favored.

Zhao Zhijian (2000) concluded that due to the development of social media, primary and secondary school students in Denmark are facing increasingly serious mental health problems. They indicated that the types of mental health problems vary with age and gender and are affected by various factors such as individuals, families, schools, and society. They mentioned that the Danish government, society, schools, and families are committed to providing diversified mental health services and promoting students' mental health and well - being through interdisciplinary and interdepartmental cooperation.

United Nations Children's Fund (UNICEF) (1953) highlighted that children who are well - nourished and vaccinated perform better at school. They pointed out that malnutrition significantly reduces children's academic performance due to stunted growth and chronic health conditions. In India, for instance, they noted that nearly 4.3 million children are malnourished, and addressing these health issues can ensure that children not only can attend school but also make progress in their studies.

Educational management is closely related to health. Education can promote health; people with higher education are more likely to develop healthy habits and understand health knowledge, thereby reducing mortality rates. Moreover, the improvement of living and medical conditions brought by a good educational background, the cultivation of a positive attitude, and other factors have a long-term impact on health, with early educational opportunities being particularly crucial.

Schools need to attach importance to mental health management, create a healthy environment through various means, and at the same time address the problem of excessive use of electronic products, establish the concept of putting health first and clarify the responsibilities of all parties. Although the evidence for a causal relationship between education and health is mixed, there is potential for positive impact. In addition, children's health is closely related to their academic performance; solving their health problems is conducive to academic progress, and for students' mental health, multiple parties need to collaborate to provide diversified services.

Good Health Education Models

Regarding good health education models, numerous scholars and institutions have explored and proposed diverse perspectives that reflect their value in promoting health education, as follows.

WHO (2020) advocated for a comprehensive school health model, emphasizing that good health education models should integrate health education into the entire school environment. This includes curriculum teaching, physical environment, school policies, and community involvement, (e.g., collaborating with local health clinics for vaccination drives). Such integration can effectively promote students' physical and mental health and lay a solid foundation for their lifelong health.

UNESCO (2019) proposed an inclusive health education model, indicating that good health education should meet the needs of all students, including those with disabilities and special health conditions. It should adopt diversified teaching methods and materials, (e.g., using braille textbooks for visually impaired students), to ensure that every student can obtain equal health education opportunities and develop healthy lifestyles.

Xu (2024) put forward the social-emotional learning (SEL) integrated health education model, stressing that good health education models should not only focus on physical health knowledge but also pay attention to students' social and emotional development. By teaching students skills such as emotion management,

interpersonal communication, and problem-solving, (e.g., conducting group counseling activities to improve students' communication skills), it can enhance their mental health and overall well-being, enabling them to better cope with various challenges in life.

Istikomah (2021) emphasized the health literacy-based education model, pointing out that good health education models should focus on improving students' health literacy. This involves helping students acquire the ability to obtain, understand, and apply health information, (e.g., teaching them how to read food nutrition labels), so that they can make informed health decisions and maintain good health in daily life.

Nova (2016) conducted a systematic review of school health education models, concluding that good health education models need to have clear goals and objectives, adopt interactive teaching methods, and be based on students' actual lives and needs. For example, designing courses around common health issues among adolescents such as tobacco and alcohol use, and using role-playing and case discussions to enhance students' participation and learning effects, which can significantly improve students' health-related knowledge and behaviors.

A good health education model should have various characteristics, including integrating health education into the entire school environment, covering curriculum, environment, policies, and community participation; meeting the needs of all students and adopting diversified teaching methods and materials to ensure equal opportunities; not only focusing on physical health knowledge but also attaching importance to students' social and emotional development, teaching relevant skills to enhance their mental health and sense of well-being; emphasizing the improvement of students' health literacy to help them obtain, understand and apply health information; at the same time, it should have clear goals, adopt interactive teaching methods, and design courses in combination with students' actual lives and needs, so as to effectively improve students' health-related knowledge and behaviors.

Strategy

Regarding the discussion on the strategy part, it mainly focused on the definition of strategy, including strategies in education and in sports; strategy theory and the methods and steps for formulating strategies. The specific contents were as follows.

Definition of strategy

"Strategy", a Chinese word, meant a plan or a stratagem. In ancient China, the word "strategy" appeared early. It was mentioned in "Personage Records-Understanding People" by Liu Shao (Three Kingdoms period) of the Wei State during the Three Kingdoms period that "Those who are skilled in schemes and strategies measure by thinking and planning, thus they can achieve extraordinary strategies but do not recognize the goodness of following the law"; In Du Fu's (Tang Dynasty) poem "Sending Li Panguan of Lingzhou off" of the Tang Dynasty, there was the line "The general is specialized in strategies, and the military office is full of talents"; In "Jin Lian Ji - Shooting Strategies" by Chen Ruyuan (Ming Dynasty) of the Ming Dynasty, there was also "What strategies do all the students have? Please declare them here"; In Sun Zhiwei's (Qing Dynasty) poem "Presented to Liang Mingfu of Ansu" of the Qing Dynasty, it was said that "The poems about recalling the past are advanced, and the strategies for worrying about the current times are new", all of which mentioned this word.

The origin of strategy could be traced back to ancient times when people began to use primary strategies to deal with survival, hunting, and resource competition. During the Spring and Autumn Period and the Warring States Period, the disputes among feudal lords promoted the further development of strategies.

Military books such as "The Art of War", "Sun Zi", "Wu Zi", and "Sun Bin's Art of War" became important achievements. "Guan Zi - Seven Methods" said: "If one does not understand the calculation but wants to undertake a major event, it is like crossing dangerous waters without a boat and oars", where "calculation" here was equivalent to the meaning of "strategy" in modern times, which played a key role in determining the direction of things and achieving goals.

In foreign countries, the word "strategy" came from the Greek word "Strategos", which meant "the art of general", that is, the art of military command. Later, the word "strategy" was introduced into management and had multiple definitions. For example, according to Alfred D. Chandler's definition of strategy by Bowman (1987), strategy was a method of designing an organization's long - term goals and decisions, as well as the actions and asset allocation required to achieve this goal.

Zhan Zehui (2009) stated that Glueck believed that strategy was a unified, coordinated, extensive and integrated plan designed to achieve an organization's basic goals.

Ohmae (2020) proposed that the only goal of strategic planning was to enable the designed organization to obtain more sufficient advantages than competitors as efficiently as possible. According to the research of Stanford Strategy Research Center, strategy was a means to pursue goals. In the process of forming this means, it reflected the changes in the designed organization's environment, the use of major resources, and the guidance for the development direction of the designed organization.

Yang Zhenrong (2017) noted that Kenny Andersen's definition of strategy was: Strategy was in the form of goals, as well as the main policies and plans to achieve the goals, determining the business that the designed organization should engage in and the category that the organization should belong to. H. Mintzberg, a professor at McGill University in Canada, proposed the "5P" model of the designed organization: Plan, Ploy, Pattern, Position, and Perspective.

To sum up, in this research, strategy referred to a comprehensive educational process centered on enhancing health literacy, well-being, and healthy behaviors, with core characteristics including clear alignment with learners' needs, comprehensive content covering physical, mental, and social health, delivery by skilled educators capable of stimulating participation enthusiasm through teaching methods, sufficient institutional support facilitating access to extracurricular health knowledge, digital adaptability, and rigorous management systems. It aimed to boost

health awareness, cultivate sustainable healthy lifestyles, and enhance overall well-being to underpin long-term sports participation.

Methods and Steps for Strategy Formulation

There were various types of strategy theories, including SWOT analysis, TOWS Matrix analysis, Porter's Five Forces model, TOWS Matrix analysis, value chain analysis, STP theory, blue ocean strategy, etc. This study mainly started from two research strategies of SWOT analysis and TOWS Matrix analysis, analyzed their research methods, and on this basis, summarized the research steps as follows:

Strategy Formulation Methods

Different strategy research methods had been proposed by experts and scholars. Among them, SWOT analysis and TOWS Matrix analysis were key tools. They evaluated internal and external factors from different angles respectively and were of great significance for formulating educational management strategies.

1. SWOT Analysis

Regarding SWOT analysis, it is a comprehensive evaluation tool that assesses the strengths, weaknesses, opportunities, and threats of an object, with wide applications across various fields to aid in strategy formulation and situation evaluation, as follows.

Heinz (1982) proposed SWOT analysis. This theory believed that by comprehensively evaluating the strengths, weaknesses, opportunities, and threats of the analyzed object, corresponding conclusions could be drawn. It had a wide range of applications and was suitable for multiple fields such as enterprise strategy formulation, competitor analysis, and market positioning. It could be used to evaluate the situation of an organization, project, product, or individual. The method was to list internal strengths and weaknesses, including aspects such as resources, capabilities, technology, and brand; identify external opportunities and threats, such as market trends, competitive situations, policies and regulations, etc.; match strengths, weaknesses with opportunities and threats to form different strategic combinations, such as SO (utilize strengths to seize opportunities), WO (overcome

weaknesses to seize opportunities), ST (utilize strengths to avoid threats), and WT (reduce weaknesses to avoid threats).

SWOT analysis was often used in strategic planning. By evaluating internal strengths, weaknesses, and external opportunities and threats, it helped formulate strategies to adapt to environmental changes. Its steps included determining the goal, collecting data, identifying internal and external factors, and formulating strategic combinations. In the research of sustainable sports participation of undergraduate students, SWOT analysis could help improve strategy formulation. The goal was to increase the sports participation rate of undergraduate students. The objects of analysis could be sports programs or participation strategies of educational institutions. Internal information such as existing sports facilities, curriculum settings, and student participation, as well as external information such as student needs, policy support, and social attention, should be collected. There were internal strengths such as rich facilities and professional coaching teams, and weaknesses such as uneven resource distribution and single courses. External opportunities included government policy support and social attention to health, and threats such as budget cuts and changes in student interests. Based on this, strategies could be formulated: carry out new activities to attract students by taking advantage of strengths (SO strategy), improve courses and obtain resources by taking advantage of policies (WO strategy), deal with budget pressure through cooperation (ST strategy), optimize distribution and course quality to reduce dependence (WT strategy), and increase participation rate and satisfaction.

Wang Fan (2024) pointed out that the development advantages of social sports instructors in China might have included the increased demand resulting from the enhanced social attention to health and the fact that some regions had already accumulated certain guiding experience. The disadvantages might have included the uneven professional quality of instructors and the imperfect incentive and guarantee mechanisms. In terms of opportunities, there was the promotion of the national fitness policy and the development of the sports industry bringing more job

positions. In terms of threats, there might have been competition from other forms of fitness guidance and fluctuations in the social recognition of guidance services.

Xie Linwei (2024) used SWOT analysis to study the development of the sports tourism industry in the Yunnan-Guizhou region. The advantages of this region might have included unique natural landscapes and ethnic cultural resources, as well as policy support for the cultural and tourism industry. The disadvantages included insufficient infrastructure construction and a shortage of professional talents. The opportunities included the continuous expansion of the tourism market and the opportunities brought by emerging tourism models. The threats included fierce market competition and the impact of natural environment changes on the tourism experience.

Xiao Hui (2024) explored the application of SWOT analysis in hospital nursing management. Its advantages might have lain in the ability to systematically sort out the problems in nursing management and clarify the direction of improvement. The disadvantages might have been the high requirements for personnel cooperation and the long - time - consuming nature during the implementation process. The opportunities included the room for improvement brought by the application of new technologies to nursing management and the promotion of improvement due to the increased requirements of patients for nursing quality. The threats included the obstruction of traditional management concepts and the implementation difficulties brought about by the mobility of nursing staff.

Tong (2023) conducted a SWOT analysis of the relevant field. The advantages might have involved the leading position of this field in some research directions and professional talent reserves. The disadvantages might have included limited research resources and difficulties in transforming research results. The opportunities included the promotion of research development by emerging technologies and an increase in international cooperation opportunities. In terms of threats, there might have been competition from relevant fields in other countries and changes in scientific research funding investment.

Ahmed (2022) explored the distributed generation framework through SWOT analysis. Its advantages might have lain in enhancing the flexibility of energy supply and facilitating the access of renewable energy. The disadvantages might have involved relatively high costs and the need to strengthen technical stability. In terms of opportunities, there could have been policy support to drive development and an increasing market demand for clean energy. Regarding threats, there might have been the impact of competing technologies and the risk of regulatory and policy changes. However, due to limited information, a complete conclusion could not be accurately drawn.

Tang (2007) used SWOT analysis to formulate the development strategy for the pilot of the agribusiness teaching factory. The advantages might have included the support of professional resources from schools and potential opportunities for cooperation with enterprises. The disadvantages might have been the gap between teaching practice and actual industrial needs and insufficient capital investment. The opportunities included the increasing attention to the development of the agricultural industry and the growing market demand for agricultural talents. In terms of threats, there might have been competition from similar teaching projects and the impact of agricultural market fluctuations.

Through detailed analysis of these factors, educational administrators could identify key areas and potential challenges for enhancing undergraduate students' sustainable participation in sports, and thus formulate targeted strategies to increase the attractiveness and effectiveness of sports activities.

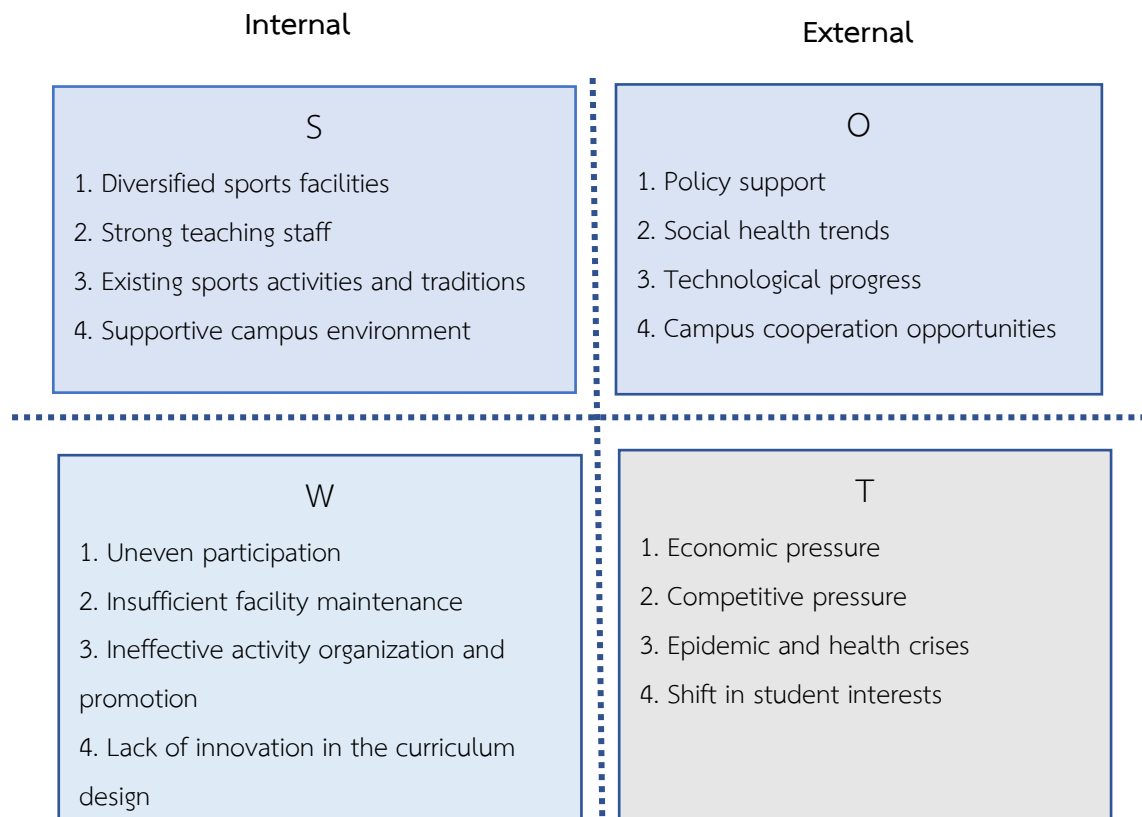


Figure 2.1 SWOT analysis method

SWOT analysis, proposed by Heinz Weirich in 1982, is a comprehensive tool evaluating strengths, weaknesses, opportunities, and threats, widely used in fields like enterprise strategy and education to formulate strategies by assessing internal and external factors, with steps including goal-setting, data collection, and strategic combination; it applies to undergraduate sports participation (analyzing facilities, policies, etc., to form SO, WO, ST, WT strategies), social sports instructors, Yunnan-Guizhou sports tourism, hospital nursing management, research fields, distributed generation frameworks, and agribusiness teaching factories, helping identify key areas and challenges for targeted strategies in various domains.

2. TOWS Matrix Analysis

The TOWS Matrix was a strategic analysis tool developed by Professor Weirich (1982) from the University of San Francisco in the United States based on the SWOT

analysis. By cross - combining the internal strengths and weaknesses of an enterprise with the external opportunities and threats of the environment, it derived four different types of strategic options, helping organizations make more targeted and adaptable strategic decisions.



Figure 2.2 TOWS Matrix analysis method

2.1 SO Strategy (Growth Strategy)

It utilized the internal strengths of the enterprise to seize external opportunities. For example, if an enterprise had advanced technology (internal strength) and there was a significant increase in market demand for products related to this technology (external opportunity), the enterprise could increase R & D investment and launch more innovative products based on this technology to expand its market share.

2.2 WO Strategy (Turnaround Strategy)

It aimed to use external opportunities to make up for internal weaknesses. For instance, although an enterprise had a shortage of funds (internal weakness), a good cooperation opportunity emerged in the market (external

opportunity). The enterprise could cooperate with other financially strong enterprises to obtain financial support, reverse its weaknesses, and jointly explore the market.

2.3 ST Strategy (Diversification Strategy)

It relied on the internal strengths of the enterprise to avoid or mitigate external threats. Suppose an enterprise had a strong brand influence (internal strength), but faced the threat of a price war from competitors (external threat). The enterprise could strengthen its brand image, launch high - end products, and avoid price competition to maintain its market competitiveness.

2.4 WT Strategy (Defensive Strategy)

It mainly focused on reducing internal weaknesses while avoiding external threats. For example, if an enterprise had slow technological updates (internal weakness) and the industry was experiencing rapid technological upgrades (external threat), the enterprise needed to increase investment in technology research and development, optimize the R&D process, and avoid being phased out of the market.

Pu (2021) pointed out that digital procuratorial business training had problems such as differences between the training objectives set by the organizers and the needs of trainees, mismatched training methods, and difficult transformation of training results. Through the SWOT - TOWS matrix analysis, it could be seen that there were internal advantages such as a mature teaching staff model, but also disadvantages like insufficient practical experience of teachers. Externally, there were opportunities such as political attention, but also threats like difficulties in data sharing. Four strategic options had been constructed. The optimization paths included expanding and strengthening the teaching staff, improving the quality of courses and compiling teaching materials; enhancing the level of attention and implementing hierarchical teaching; improving the scientific nature of teaching methods and strengthening practical training; and increasing investment in software and hardware to promote the integration of online and offline training.

Jamil (2015) pointed out that in the development of Guan Gong cultural sports tourism, Yuncheng had advantages such as profound historical and cultural

heritage and rich resources, but also had disadvantages like a weak mass sports foundation. There were opportunities brought by the "Yellow River Golden Triangle Regional Tourism Plan", and also threats such as unremarkable tourism brands. Based on the TOWS analysis, five development strategies had been determined, and other strategies for different environments had been proposed. The development paths included taking Guan Gong cultural festivals as the connotation, implementing the strategies of root - ancestor culture and salt - lake culture as the extension, and realizing product upgrading and transformation through regional cooperation and product integration.

Gu (2013) pointed out that in the first batch of pilot primary schools in Beijing, the Healthy Physical Exercise and Dance for Chinese Adolescents was mostly carried out in the form of collective teaching during the long break and club classes. The students had a good foundation and the teachers were supportive, but the theoretical basis and promotion channels needed to be improved. This project met national requirements and had value, but there were problems such as low attention and insufficient theoretical research. It was necessary to take advantage of policies and the opportunity of the Winter Olympics, use new media for publicity, improve the theory, and enhance social awareness. Specific strategies included responding to national policies, using external forces for publicity, carrying out talent cultivation, and strengthening the integration of teaching, training, and competition systems.

Liang (2000) pointed out that the strategic planning for the development of regional competitive sports was of great significance, but the current formulation method was not ideal. The TOWS analysis could improve the SWOT analysis and help formulate more scientific and reliable strategic plans. The development of competitive sports in Liaoning had advantages in terms of venues, talent, etc., but also had disadvantages such as unclear strategic positioning. It faced opportunities such as the construction of a sports - power country, and also challenges such as the successful holding of other sports events. Therefore, Liaoning should have implemented five strategies, such as the characteristic culture strategy, to promote the sustainable development of competitive sports.

To sum up, the TOWS Matrix, an extension of SWOT analysis, was a strategic tool that combined internal and external factors to provide four strategic options. It had been effectively used in areas like digital procuratorial training, youth sports promotion, cultural sports tourism, and regional sports development. When applied to "Good Health Educational Management Strategies for Enhancing Sustainable Sports Participation of undergraduate Students", it could help identify undergraduates' internal strengths and weaknesses in sports education, along with external opportunities and threats. By formulating strategies such as SO, WO, ST, and WT, undergraduates could have promoted students' sustainable sports participation through various means like leveraging strengths, seizing opportunities, and addressing weaknesses and threats.

Strategy Formulation Steps

Regarding the steps of formulating strategies, different scholars had different views. The following were the research conclusions from some representative scholars:

Li Leimin (2023) believed that the strategies for formulating to promote undergraduate students' participation in extracurricular physical exercise could be developed from the following aspects: (1) strengthening the linkage between physical education courses and extracurricular activities to enhance students' exercise awareness; (2) providing a good exercise environment and facilities to improve the convenience of students' participation; (3) stimulating students' exercise interests through various forms of sports activities; (4) establishing an incentive mechanism to promote students' long-term participation.

Zhao Lili (2021) proposed that the strategies for formulating to improve undergraduate students' participation in extracurricular physical exercise could be developed from the following aspects: (1) starting from the sustainable development system, first enhancing students' attention to physical exercise through "brainwashing" education; (2) accelerating the pace of physical education curriculum reform to stimulate students' sports interests; (3) expanding extracurricular physical exercise projects and enriching project contents to meet students' diverse needs;

(4) strengthening the organizational construction of associations and clubs to enhance students' sense of collective belonging and participation enthusiasm; (5) establishing a guarantee service system to provide necessary facilities and venue support.

Gao Wanhui (2020) believed that the strategies for formulating to realize the educational value of geography discipline could be developed from the following aspects: (1) strengthening the awareness of the disciplinary teaching value of geography discipline so that students could recognize the importance of geographical knowledge; (2) optimizing teaching content and methods and stimulating students' learning interests through diversified teaching means; (3) combining with real life and carrying out practical activities so that students could consolidate knowledge and improve learning effects in practice; (4) strengthening teachers' teaching ability and improving educational effects.

Dong Wei (2019) pointed out that the strategies for formulating to enhance students' learning participation in pharmacology blended learning could be developed from the following aspects: (1) designing diversified learning content to meet the learning needs of different students; (2) providing abundant learning resources and tools to support students' autonomous learning; (3) strengthening teacher-student interaction and improving students' participation through discussion and feedback; (4) continuously monitoring and evaluating learning effects and making timely teaching adjustments.

Zhang Xue (2017) believed that the strategies for formulating to promote teacher professional development and teaching improvement could be developed from the following aspects: (1) carrying out peer mutual assistance activities, especially in the forms of observing classroom teaching, directional discussions, collective lesson preparation and topic research; (2) promoting professional development among teachers through peer mutual assistance and improving teaching quality and effects; (3) formulating rational teaching strategies and solving problems and obstacles in teaching through collective wisdom.

Huang (2014) believed that the strategies for formulating to improve students' participation in classroom activities in undergraduate English teaching could be developed from the following aspects: (1) analyzing students' learning needs and designing classroom activities targeted; (2) using multimedia technology and interactive teaching methods to increase students' enthusiasm for participation; (3) regularly evaluating and adjusting teaching strategies and continuously optimizing classroom activities according to feedback.

In short, the steps for formulating strategies could be summarized into four steps: (1) Analyzing needs and clarifying objectives, which involves understanding the actual needs of the target group (such as students' learning needs, disciplinary development requirements) and defining clear goals to be achieved (such as improving participation, realizing educational value); (2) Designing targeted strategies and methods, including formulating specific measures according to needs, such as optimizing content, innovating methods, and expanding projects to meet diverse demands; (3) Promoting implementation and ensuring resources, which means providing necessary support (such as facilities, resources, organizational construction) and promoting the implementation of strategies through collaboration and management; (4) Monitoring, evaluating and optimizing, that is, continuously tracking the implementation effect, collecting feedback, and adjusting and improving strategies in a timely manner to enhance effectiveness.

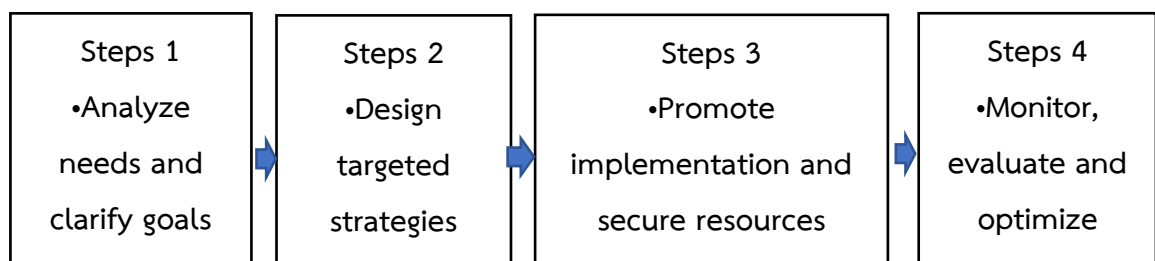


Figure 2.3 Develop strategy steps

Sustainable Sports Participation

Sports participation was a crucial element in promoting undergraduate students' physical and mental health and all - round development, serving as the cornerstone for achieving the goal of sustainable sports engagement among this group. It involved various aspects from theoretical underpinnings to practical influencing factors, which together shaped the landscape of undergraduate students' involvement in sports.

Sports Participation

As shown below was a literature review on sports participation. In this part, the definition of sports participation was systematically expounded. undergraduate students' sports participation was expounded from seven different angles. At the same time, the theoretical basis, components, and influencing factors of sports participation were expounded. Specific research was as follows:

1. The Definition of Sports Participation

The definition of sports participation could be traced back to the early 20th century. The earliest clear proposal and exploration of this concept was by the American sociologist Alvin Gouldner in the 1960s. He believed that sports participation was a social behavior that involved individuals' active participation in sports activities and the establishment of social connections and the attainment of personal satisfaction through such participation.

The World Health Organization (WHO) (2018) stated that sports participation was the behavior of individuals to improve and maintain their health level through participation in various sports activities. WHO believed that sports participation was not only physical activity but also included the positive impact on physical and mental health.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) (1926) pointed out that sports participation referred to the behavior of individuals to promote physical and mental development and social integration through participation in organized sports and recreational activities. UNESCO emphasized that sports participation contributed to individual development and social cohesion.

The International Olympic Committee (IOC) (1894) stated that sports participation referred to the active participation of individuals in sports events and activities aimed at enhancing physical fitness, cultivating a competitive spirit and promoting international exchanges. The IOC emphasized that sports participation was not only physical exercise but also a way of cultural exchange and spiritual cultivation.

Sport England (2014) pointed out that sports participation referred to an individual's regular or occasional participation in organized or spontaneous sports activities for the purpose of entertainment, fitness or social interaction. Sport England considered sports participation as an important component of health.

The Australian Sports (2017) Commission pointed out that sports participation referred to the behavior of individuals of all ages enhancing health, social interaction and quality of life through different forms of sports activities. The Australian Sports Commission emphasized the positive impact of sports participation on the entire society.

The China Sports Science Society (2023) proposed that sports participation was the active participation of people in various sports programs and activities to achieve their own development and meet specific needs through physical exercise.

In domestic and international research, the concept of sports participation had gradually gained attention, especially in some works in the fields of physical education and sociology, as follows:

Bailey and Pearce (2013) proposed that sports participation referred to the process in which individuals experienced sports culture through active participation or as spectators in various sports environments. They believed that sports participation not only included actual physical activities but also watching, supporting and participating in sports culture.

Eime (2013) proposed that sports participation referred to the behavior of individuals enhancing physical fitness, social ability and sense of community integration through various sports activities. The research emphasized the role of sports participation in social and community construction.

Zhou Zhijia (2011) proposed that sports participation referred to the behavior of individuals promoting physical health and psychological satisfaction through participating in sports activities. He believed that sports participation could not only enhance physical fitness but also improve mental health level.

Sun Shengling (2008) proposed in the research that sports participation referred to the purpose that people achieved physical exercise, mental pleasure and social communication by participating in different types of sports activities. The author emphasized that sports participation was an indispensable part of modern life and could effectively improve the quality of life.

Zheng Houchéng (2006) pointed out that sports participation referred to the behavior of individuals improving physical fitness and mental health through participating in various sports activities. The author believed that sports participation was not only the fitness need of individuals but also included realizing self - value and social interaction through sports activities.

Yan Zhongbo and Tian Yonglei (2006) proposed in the research that sports participation was the process in which students enhanced physical fitness, cultivated team spirit and improved psychological quality by participating in school sports activities. It was emphasized that school sports played an important role in the all - round development of students, and sports participation was the core of this process.

Deng Ronghua(2001) pointed out in "National Fitness and Social Development" that sports participation referred to the behavior of individuals of all ages enhancing physical health and promoting social interaction through sports activities. Sports participation was an important part of national fitness and promoted social harmony and progress.

To sum up, in this research, sports participation referred to individuals' active engagement in various sports activities (and, in a broader sense, involvement in sports culture as spectators or supporters) with the aims of enhancing physical and mental health, fostering social connections and community integration, achieving personal development (such as self-value realization and improved quality of life),

and contributing to societal benefits like social cohesion, cultural exchange, and overall well-being.

2. Theoretical Support for Sports Participation

Maslow's Hierarchy of Needs Theory, Self-Determination Theory and Theory of Planned Behavior provided theoretical support for enhancing undergraduate students' sports participation. They were introduced as follows:

Maslow's Hierarchy of Needs Theory

Maslow's Hierarchy of Needs Theory was proposed by psychologist Abraham Maslow in 1943. He first systematized this theory in his paper "A Theory of Human Motivation" and later elaborated on it in detail in the book "Motivation and Personality" published in 1954. The representative figure, Abraham Maslow, was an American psychologist, mainly known for his Hierarchy of Needs Theory and humanistic psychology. His main viewpoints: Maslow's Hierarchy of Needs Theory believed that human needs were arranged in ascending order from low to high: (1) Physiological needs: such as basic survival needs like food, water, sleep; (2) Safety needs: such as personal safety, economic stability, health, etc.; (3) Social needs: such as interpersonal relationships like a sense of belonging, friendship, and love; (4) Esteem needs: such as self-esteem, respect from others, a sense of achievement, etc.; (5) Self-actualization needs: such as realizing personal potential, creativity, personal growth, etc.

Wang (2022) concluded that: (1) By meeting students' "respect needs" and "self-actualization needs" in table tennis courses, it discussed how to enhance their sense of sports participation and achievement; (2) It emphasized that physical education teaching design should meet students' "social needs" and "safety needs" to promote their continuous participation and interest improvement; (3) It pointed out that in teaching, it was necessary to enhance students' "sense of belonging needs", and improving participation could enhance students' sports participation effect.

Chen Ping and Chen Sheng (2020) concluded that: (1) The article discussed that physical education curriculum management should first meet students' "safety needs" and "respect needs" to ensure their active participation in sports; (2) It

emphasized that teaching management needed to consider students' "social needs" and "self-actualization needs" to enhance their sense of participation and achievement in sports activities; (3) It pointed out that improving the educational environment and meeting students' "physiological needs" and "safety needs" were important factors in improving students' sports participation.

The research of Xie Xun and others (2012) concluded that: (1) The article discussed improving students' sense of achievement and participation in sports activities by meeting their "respect needs" and "self-actualization needs"; (2) It pointed out that curriculum goals should be properly set to meet students' "safety needs" and "social needs" so as to ensure their enthusiasm and initiative for sports participation; (3) It emphasized that in teaching, attention should be paid to students' "sense of belonging needs", which had a significant effect on improving their sense of sports participation and achievement.

Zhu Yang (2012) pointed out that: (1) The "knowledge-seeking needs" and "physiological and safety needs" in Maslow's hierarchy of needs were closely related to the educational and cultural needs of athletes, emphasizing the fundamental role of education in students' sports participation; (2) In terms of athletes' retirement and employment issues, the article pointed out the importance of "safety needs", indicating that meeting basic safety needs was the basis for students' long-term participation in sports; (3) The article also emphasized the priority of mass sports, which was related to Maslow's "social needs" and "respect needs", indicating that extensive participation and social recognition were important motivations for students' sports participation.

Lin Weipeng (2009) concluded that: (1) Through Maslow's "self-actualization needs", it discussed the role of innovative teaching in improving students' sports participation, indicating that meeting high-level needs could stimulate students' sports enthusiasm and participation; (2) It was proposed that different teaching methods should meet students' "respect needs" and "social needs" to better promote students' active participation in sports activities; (3) It emphasized that teachers' innovative qualities should meet students' "self-actualization needs", and

teachers' guidance and support were crucial for students' continuous participation in sports.

Through the above analysis, the relevance of Maslow's needs theory in students' sports participation was mainly reflected in the following aspects: First, self-actualization needs: High-level needs, such as sense of achievement and self-actualization, played an important role in inspiring students to continuously participate in sports. Second, safety and security needs: Basic safety and physiological needs were the foundation for students to participate in sports, especially evident in the education and employment issues of professional athletes. Third, social and respect needs: Students' sense of social identity and respect needs directly affected their sports participation. Appropriate curriculum design and teaching methods could improve participation effects. Fourth, educational and cultural needs: Meeting students' knowledge-seeking needs, especially at the educational and cultural levels, was conducive to their long-term development in sports.

Self-Determination Theory

Self-Determination Theory was first proposed by psychologists Edward Deci and Richard Ryan in 1985. This theory emphasized the individual's intrinsic motivation and their autonomy in behavioral choices. American psychologists Edward Deci and Richard Ryan were mainly known for their research on motivation and its influence on human needs. Self-Determination Theory mainly focused on three basic psychological needs: (1) Autonomy: Individuals hoped to be able to independently choose and control their own behaviors; (2) Competence: Individuals hoped to obtain a sense of achievement and competence in activities; (3) Relatedness: Individuals hoped to establish good relationships and social connections with others.

Song Zihan (2024) found that internal motivation played a key role in undergraduate students' participation in sports, while external motivation could better increase the frequency of sports participation. The overall amount of exercise for undergraduate students was relatively low. The amount of exercise, time and intensity were significantly related to internal and external motivation, and exercise frequency was significantly related to external motivation. Senior students and

students majoring in physical education had higher exercise motivation and amount of exercise.

Yi Mingyu (2018) analyzed physical exercise behavior with self-determination theory and found that internal motivation and identified regulation (such as health or weight management) were important factors in promoting undergraduate students to participate in physical exercise. Although external motives such as rewards and mandatory requirements could prompt short-term participation, they were not conducive to the persistence of long-term exercise behavior.

Dong Baolin (2014) analyzed the relationship between undergraduate students' exercise motivation and exercise behavior from the perspective of self-determination theory and indicated that internal and external motivation played an important role in promoting students' continuous exercise. High-autonomy motivation would bring higher sports participation, while lack of motivation would lead to a reduction in exercise behavior.

Hu Min and Xiang Mingqiang (2014) showed that autonomous motivation (such as enjoying the fun of sports itself and pursuing personal goals) was closely related to the participation of adolescents in physical exercise. Students with high autonomous motivation were more inclined to set internal goals when setting exercise goals, and this internal goal had a positive relationship with continuous exercise behavior.

Xia (2012) explored how internal motivation in self-determination theory promoted students to reach the trait flow state in sports. The research found that when students felt autonomy, sense of competence and relationship satisfaction in sports, they were more likely to enter the trait flow state, thereby increasing sports enthusiasm and participation.

Wang (2005) established a motivation model based on self-determination theory to explore the behavior mechanism of undergraduate students' evasion of extracurricular sports. The research found that a social environment with low autonomous support (such as the behaviors of schools, parents and teachers)

reduced students' sense of competence and autonomy, resulting in low self-determined motivation and ultimately triggering the behavior of evading sports.

The above researches jointly explored the role of self-determination theory in students' sports participation and emphasized the importance of autonomous support and internal motivation in promoting continuous sports. The researches unanimously believed that external motivation could increase the sports participation rate in the short term, but internal motivation and sense of autonomy were the key factors in determining the formation of long-term exercise habits. A low-autonomy-support environment reduced students' willingness to participate in sports, while providing a good autonomous support environment could effectively improve students' exercise motivation and participation.

Theory of Planned Behavior

The Theory of Planned Behavior was proposed by psychologist Icek Ajzen in 1985 and is an expansion and supplement to the previous Theory of Reasoned Action. Icek Ajzen, an American psychologist, mainly studies theories of behavior prediction and behavior change. The Theory of Planned Behavior holds that the occurrence of behavior is influenced by the following three main factors: (1) Attitude: The overall evaluation of an individual towards a certain behavior (such as whether they think participating in sports activities is beneficial); (2) Subjective norm: The social pressure perceived by the individual (such as whether they are influenced by the expectations of peers, family or society); (3) Perceived behavioral control: The individual's perception of their ability to implement a certain behavior (such as whether they think they can participate and continuously engage in sports activities).

Xu Quan (2024) studied and analyzed the reasons for undergraduate students' evasion behavior in extracurricular physical exercise and found that the three major factors of behavioral attitude, subjective norm and perceived behavioral control jointly act on students' exercise evasion behavior. In particular, negative behavioral attitudes and low perceived behavioral control are the keys to evasion behavior.

Niu (2023) studied and explored the impact of campus mobile intervention technology on undergraduate students' physical exercise behavior. The results

showed that behavioral attitude, subjective norm and perceived behavioral control in the theory of planned behavior all significantly affected undergraduate students' participation in physical exercise. In particular, behavioral attitude played a prominent role in promoting participation.

Kang (2022) took undergraduate students from Harbin Institute of Physical Education as the research object and analyzed their intention of physical exercise behavior based on the theory of planned behavior. The results showed that the three major factors of behavioral attitude, subjective norm and perceived behavioral control all had a significant positive impact on undergraduate students' intention of physical exercise behavior. Among them, behavioral attitude had the most significant impact on behavioral intention, followed by subjective norm, and perceived behavioral control had the weakest impact.

Lim (2022), after a comparative study of non-sports major students, found that factors such as gender and grade affected students' physical exercise behavior through behavioral attitude and subjective norm. The sports population showed more positive behavioral intentions in exercise time and participation than the non-sports population.

The research of Chen Luosong and She Zihang (2019) showed that using sports apps on smartphones significantly improved undergraduate students' behavioral attitudes and behavioral habits in physical exercise. However, the correlation between the "subjective standard" variable and behavioral habits was weak, indicating that the explanatory power of the theory of planned behavior has certain limitations.

The above studies had verified the effectiveness of the theory of planned behavior in explaining undergraduate students' participation in physical exercise through different angles and methods. In particular, behavioral attitude played a key role in predicting and influencing students' behavioral intentions.

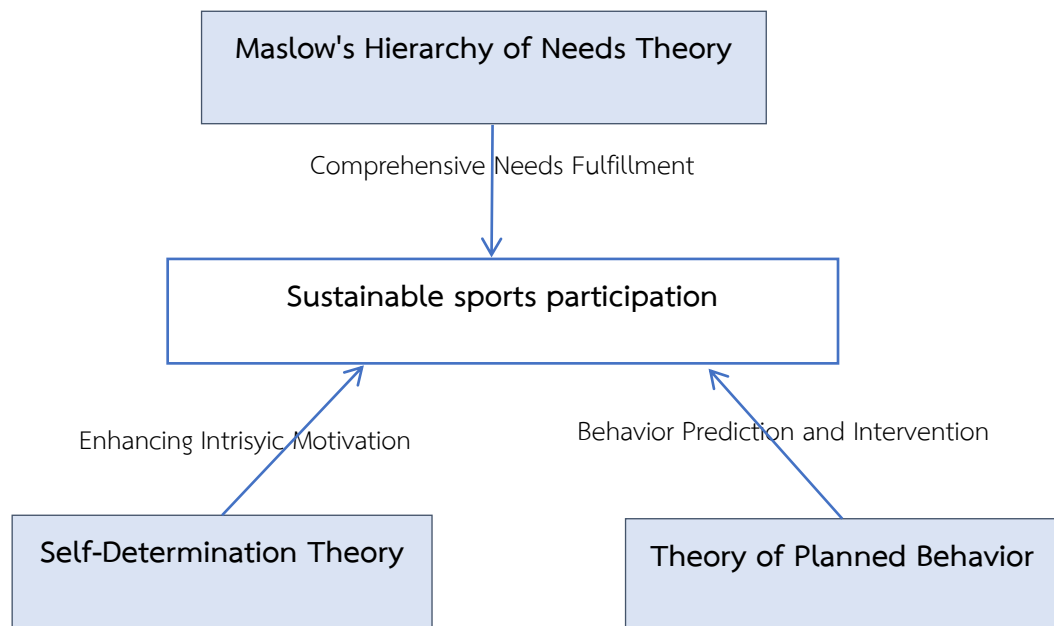


Figure 2.4 The theoretical framework diagram

3. Components of Sports Participation

In the field of sports participation research, several theoretical frameworks and research models have been widely applied to analyze its components and influencing factors. First, as the theoretical basis for exploring sports participation, three key theories provide foundational insights: (1) Maslow's Hierarchy of Needs Theory (MNH) explores the motivational drivers behind participation, linking it to the fulfillment of hierarchical needs. (2) Self-Determination Theory (SDT) focuses on the role of intrinsic and extrinsic motivations in sustaining active engagement in sports. (3) Theory of Planned Behavior (TPB) emphasizes the influence of attitudes, subjective norms, and perceived behavioral control on individuals' intentions to participate in sports.

In addition to these theoretical foundations, common research models further elaborate on the multi-faceted factors shaping sports participation, particularly among undergraduate students: (1) Social Ecological Model (SEM) highlights the interaction of multi-level factors, including individual characteristics,

social relationships, community environments, and policy contexts, which collectively influence sports participation behavior. (2) Health Belief Model (HBM) centers on individuals' perceptions of health behaviors, specifically examining how perceived benefits of exercise, perceived barriers, and self-efficacy impact their participation. (3) Social Cognitive Theory (SCT) underscores the role of self-efficacy, social support, observational learning, and behavioral reinforcement in driving and maintaining sports participation.

Together, these theories and models have effectively analyzed various influencing factors of undergraduate students' sports participation—such as motivation, social support, environmental conditions, and psychological needs—and yielded substantial findings in empirical research.

Fan Wenbin and Xie Jun (2023) showed that the composition of sports participation involved sports experience and sports social interaction. Age and gender showed different characteristics in all aspects of sports participation. The level of community sports services affected the enthusiasm of residents' sports participation.

Xu Jincheng (2018) concluded that sports participation included the investment of sports time and the selection of sports events. Professional characteristics could lead to different ways of sports participation among different groups. Policy orientation had positive significance for promoting sports participation.

Gong Qingbo (2015) concluded that the composition of sports participation covered the setting of sports goals and the implementation of sports plans. The family sports atmosphere had a significant impact on teenagers' sports participation. Media publicity could change the public's perception and behavior of sports participation.

Lin (2012) indicated that from a psychological perspective, sports participation included sports expectations and sports cognition. Physical fitness at the physical level was an important basis for sports participation. Economic factors such as sports consumption ability would restrict the breadth of sports participation.

Luo Xu (2010) found that sports participation was composed of multiple dimensions such as sports motivation, sports frequency, and sports intensity. There

were significant differences in various dimensions of sports participation among people of different age groups. Social support could promote the sustainability of sports participation.

Hao (2010) pointed out that the composition of sports participation included personal interests and the degree of mastery of sports skills. Environmental factors such as the convenience of venue facilities would affect sports participation behavior. The sports participation attitude of peers had a driving effect on an individual's sports participation.

Manger (2005) revealed that the components of sports participation encompassed sports motivation and sports behavioral patterns. Education level and income status demonstrated distinct characteristics in various dimensions of sports participation. The adequacy of urban sports facilities influenced the enthusiasm of citizens' sports participation.

In summary, the components of sports participation include theoretical frameworks, research models (Social Ecological Model, Health Belief Model, Social Cognitive Theory), and multi-dimensional components identified in studies (sports experience, social interaction, time investment, event selection, goal setting, expectations, motivation, frequency, intensity, personal interests, skill mastery). These form the analytical basis of this research, which was used to analyze sports participation's influencing factors (motivation, social support, environmental conditions, psychological needs, etc.) by examining interactions between multi-level factors, individual perceptions, behavioral drivers, and participation's dimensional characteristics.

Table 2.1 The composition of sports participation under different models

Model	Level / Element	Specific content
SEM	Individual level	Sports interest and motivation; Health awareness; Time management and arrangement
	Social relationship level	Family support; Influence of friends and peers; Social support network
	Community level	Sports facilities and resources in schools; Campus culture and atmosphere; Accessibility of community sports activities
	Policy level	School sports policies; Government's sports development policies; Setup of physical education courses
SDT	Autonomy	Degree of freedom in choosing sports events; Voluntariness in participating in sports
SDT	Competence	Confidence in one's own sports ability; Sense of achievement and progress experience in sports
	Relatedness	Social connection with others during sports; Sense of belonging in sports teams
TPB	Attitude	Cognition of the benefits of sports; Personal interest and emotional response to sports
TPB	Subjective norm	Expectations and support from family, friends and peers; Degree of social and cultural emphasis on sports
	Perceived behavioral control	Ability to manage time by oneself; Availability and convenience of sports resources; Confidence in sports through self-efficacy

Table 2.1 (Continued)

Model	Level / Element	Specific content
HBM	Perceived susceptibility	Perception of health risks due to lack of Exercise
	Perceived severity	Cognition of serious health consequences that may result from not exercising
	Perceived benefits	Positive effects of participating in sports on health, appearance, psychology, etc.
	Perceived barriers	Lack of sports time, venues and equipment; Risk of injury and sports fatigue
SCT	Self-efficacy	Confidence and ability in adhering to sports by oneself Confidence in completing sports tasks; Confidence in coping with sports difficulties
SCT	Social support	Support and encouragement from family, friends and school; Role models in social networks
	Observational learning	Learning by observing others' sports behaviors; Acquiring sports knowledge and skills through media
	Behavioral reinforcement	Enhancing sports participation through rewards or encouragement; Positive feedback on the sense of achievement in sports

Sustainable Development

The sustainable development part mainly discussed from the definition and principles of sustainable development as well as the connection between sustainable development and educational management. Specific contents were as follows:

Definition of sustainable development

Since the Industrial Revolution, humanity's pursuit of economic growth, driven by excessive exploitation of natural resources and disregard for environmental protection, has triggered a series of global crises such as deforestation, soil degradation, water scarcity, biodiversity loss, and climate change. By the mid-20th century, these issues drew widespread international attention: Rachel Carson's 1962 book *Silent Spring* exposed the ecological damage caused by chemical pesticides, awakening environmental awareness, while the 1972 UN Conference on the Human Environment in Stockholm marked the first integration of environmental issues into global governance. Over time, it became clear that environmental, economic, and social development are interdependent, and the concept of "sustainable development" emerged to balance these dimensions, ensuring long-term well-being for both current and future generations.

The United Nations, a key driver in shaping this concept, saw its World Commission on Environment and Development (Brundtland Commission) put forward a globally recognized definition in the 1987 report *Our Common Future*: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This definition centers on two core principles: addressing current challenges like poverty, hunger, and inequality to secure basic survival and development rights, while respecting ecological carrying capacities to avoid undermining future generations' access to resources and opportunities.

The UN's understanding of sustainable development has evolved with global challenges. The 1992 Rio de Janeiro Summit's Agenda 21 refined sustainable development into three coordinated pillars-economy, society, and the environment-while the 2015 2030 Agenda for Sustainable Development introduced 17 Sustainable Development Goals (SDGs) covering areas from poverty eradication to climate action, translating the definition into actionable frameworks. This dynamic concept, breaking the "development vs. environment" dichotomy and emphasizing intergenerational

equity, has become a guiding principle for global policy-making and international cooperation.

The Concept of Sustainable Development of undergraduate Students' Sports Participation

The concept of sustainable development of undergraduate students' sports participation contained multiple aspects such as physical health, mental health, social responsibility and environmental awareness. Continuous sports participation could not only help personal all-round development, but also promote the sustainability of campus culture, social responsibility and environmental protection.

Song Chongli (2023) conducted research on the development of the Chinese University Sports Association. The research concluded that the association should clearly aim to enhance undergraduate students' sports interest, enrich their extracurricular lives, and promote their comprehensive development. This indicates that in the context of sustainable development of undergraduate students' sports participation, fostering students' interest in sports is fundamental. By organizing diverse sports activities and clubs, students' enthusiasm for long - term sports participation can be continuously stimulated, laying a solid foundation for their sustainable sports development.

Zheng Yuan (2023) pointed out that for undergraduate students to engage in sports, mastering certain sports skills is necessary. Without proper skills, students may not only fail to enjoy the fun of sports but also risk getting injured. This implies that in promoting the sustainable development of undergraduate students' sports participation, educational institutions should focus on providing systematic and professional sports skill training. Through improving the quality of physical education courses and offering additional training sessions, students can build a strong skill base, which is crucial for their continuous and safe participation in sports.

Li Xiaodong (2020) showed that sports intervention can effectively improve undergraduate students' mental health, such as reducing anxiety and depression levels and improving sleep quality. This reveals that the sustainable development of undergraduate students' sports participation not only benefits physical health but

also has a positive impact on mental well - being. Incorporating sports into students' long - term lifestyle can help them maintain a healthy mental state, which in turn promotes their sustainable participation in sports.

Xu Yao (2019) found that 92.97% of the surveyed undergraduate students believed that sports were important. This high recognition rate indicates that there is a good foundation for promoting the sustainable development of undergraduate students' sports participation. However, factors such as lack of exercise partners, heavy schoolwork, and fear of fatigue still limit students' participation. Therefore, to achieve sustainable development, undergraduates need to address these issues, for example, by creating sports communities to facilitate partner - finding and optimizing the curriculum arrangement to ensure students have time for sports.

Gage (2019) in the integration of undergraduate students' physical health and sports showed that by organizing sports events, providing personalized exercise plans, and establishing an incentive mechanism, students' enthusiasm for sports can be effectively mobilized. This provides practical experience for the sustainable development of undergraduate students' sports participation. Other undergraduates can learn from these practices, such as setting up rewards for students' continuous sports participation and offering customized sports guidance according to students' physical conditions.

In summary, research on the concept of sustainable development of undergraduate students' sports participation covers multiple dimensions. It is emphasized that fostering students' sports interest through diverse activities and clubs is fundamental. The necessity of systematic sports skill training to ensure continuous and safe participation is highlighted. It is revealed that sports intervention benefits mental health, promoting long - term participation. Surveys show high recognition of sports among undergraduate students but also identify limiting factors like lack of partners and heavy schoolwork that need to be addressed. Additionally, practical approaches such as organizing events, offering personalized plans, and establishing incentive mechanisms to mobilize students' enthusiasm are provided, all

contributing to the understanding of promoting sustainable sports participation among undergraduate students.

Principles of sustainable development

The principles of sustainable development were the core concepts guiding the coordinated development of economy, society and environment. These principles emphasized that while meeting the needs of the present generation, it should not cause harm to the needs of future generations. The main sustainable development principles included the following aspects:

1. Environmental protection principle

Bai (2023) stated that environmental protection was the core of sustainable development. This principle advocated that economic activities and social development should be within the scope of environmental carrying capacity and avoid irreversible environmental damage. Resource exploitation and utilization needed to consider long - term impacts to ensure the health of ecosystems and biodiversity. Specific measures included reducing pollution, saving energy, protecting forests and water resources, etc., to ensure that natural resources were renewable and the environment was bearable, laying the foundation for the long - term development of mankind.

2. Principle of economic feasibility

Tang Chun (2024) proposed that economic feasibility meant that development must be economically sustainable and support long - term economic growth. It could not rely on short-term benefits or unsustainable resource consumption. It emphasized that economic development should improve the quality of life without sacrificing the environment and social equity. Development strategies should have included effective use of resources, technological innovation, improvement of productivity, while reducing poverty and promoting fair distribution, so that economic activities were coordinated with the sustainable use of natural resources and avoided long - term economic recession and resource depletion.

3. Principle of social equity

Hu Yuhong (2015) pointed out that social equity was a key dimension of sustainable development, focusing on the fair distribution of social resources and equality of opportunity. It required the elimination of poverty, reduction of inequality, protection of basic human rights and social welfare, and ensured that all strata fairly shared the fruits of development, especially paying attention to vulnerable groups. It helped maintain social stability and harmony and prevented social conflicts and turmoil caused by unfairness.

4. Principle of intergenerational equity

Dan Chenglong (2005) held that the principle of intergenerational equity stated that current resource utilization and development activities should not harm the interests of future generations. When developing resources, the needs of future generations should be considered to ensure the sustainability of resources and give future generations the same development opportunities and quality of life. This long - term perspective prompted decision - making to consider a broader time span and avoided short - sighted behavior.

5. Principle of participation

Chen (2014) emphasized that the principle of participation emphasized that all stakeholders should fully participate in sustainable development decision - making. Governments, enterprises, non - governmental organizations, communities and individuals should jointly participate in decision - making to ensure the transparency and fairness of policy formulation and implementation. Extensive social participation could make development policies and actions meet the needs of different groups and obtain broader support and recognition, and realize a more democratic and inclusive social governance model.

6. Principle of comprehensiveness

Fang Mengzhi (1996) believed that sustainable development was a comprehensive concept that required the interconnection and coordinated development of economy, society and environment. When formulating and implementing development policies, the needs and interactions of these three fields

must be taken into account, and one - sided pursuit of a certain aspect was not allowed. The comprehensive principle ensured that the development strategy was comprehensive and systematic, balanced short - term interests and long - term goals, and avoided the negative consequences of one - sided development.

The various principles of sustainable development were interrelated and jointly built a complete framework to guide us to achieve economic growth and social progress under limited resources and environmental carrying capacity. These principles were not only guidelines for the development strategies of countries and enterprises, but also guidelines for individual daily behaviors. Following these principles could promote the development of human society in a more harmonious, fair and lasting direction.

Definition of Sustainable Sports Participation

Research on sustainable sports participation had attracted the attention of experts and scholars from various countries in recent years. The following were some research discussions:

Xu Yanling (2023) defined sustainable sports participation as a form of sports engagement that includes environmental awareness and practices. It refers to sports participation that advocates green event-hosting concepts, reduces environmental damage caused by sports events, and promotes environmentally-friendly sports equipment and facilities. It also involves propagating environmental awareness through sports activities to form a virtuous interaction between sports participation and environmental protection, ensuring the long-term sustainability of sports engagement.

Huang Feihong (2023) put forward that sustainable sports participation should be characterized by economic accessibility and long-term support. It means sports participation that is not overly burdened by high consumption costs such as gym membership fees and sports equipment prices. It also includes the support of government economic policies (such as tax incentives and financial subsidies) for the sports industry, as well as the reasonable allocation of economic benefits from

sports events to construct sports infrastructure and promote sports activities, thereby ensuring people can participate in sports sustainably.

Ren Fei (2020) believed that sustainable sports participation, in the context of technological development, refers to long-term sports engagement facilitated by digital tools. It includes the use of sports apps to record data and provide personalized suggestions, the application of VR and AR technologies to create novel sports experiences, and the use of smart wearable devices to monitor physical indicators in real-time, all of which help maintain users' enthusiasm and continuity in participating in sports activities.

Guo Xinbin (2018) defined sustainable sports participation for the elderly as long-term sports engagement centered on physical health and social support. It means sports participation that involves developing targeted exercise plans to improve the elderly's physical functions, relies on a social support system (such as family encouragement and community care), and includes the selection of appropriate low-intensity sports events (like Taijiquan and slow walking) suitable for the elderly to participate in over the long term.

Zhou Jiang (2017) pointed out that sustainable sports participation for urban residents refers to long-term sports engagement supported by sufficient material conditions and organizational guarantees. It includes having access to adequate sports venues through reasonable land planning, balancing work and exercise time amid busy lifestyles, and relying on strong community sports organizations to provide guidance and organization, thereby ensuring residents can participate in sports sustainably.

Ji Ling (2011) defined sustainable sports participation for adolescents as long-term sports engagement influenced by family, school, and community factors. It means sports participation that is promoted by a positive family sports atmosphere, enriched and interesting school physical education courses, and improved community sports facilities, all of which enhance adolescents' interest and continuity in participating in sports activities.

To sum up, in this research, sustainable sports participation referred to long-term, continuous engagement in sports activities by undergraduates, integrating multiple dimensions: campus environment adaptability, which was supported by attractive sports activities, complete facilities, and a strong sports atmosphere; incentive and club integration, which was maintained through a sense of gain from club activities, effective incentive mechanisms, and skill improvement via club training; time management balance, which alleviated exercise time extrusion and enhanced exercise experience under existing time patterns; psychological and family support, which was sustained by exercise's stress-relief effect, family sports support, and family health concept guidance; and technological and behavioral synergy, which was facilitated by digital tools and healthy living habits. It balanced these aspects to enable steady long-term sports involvement.

Key Factors Affecting Students' Sustainable Sports Participation

In the journey of exploring sustainable sports participation, it was of great significance to deeply analyze the key factors that affected students' active and continuous participation in sports activities. The following were discussed in a comprehensive and detailed manner from eight dimensions: educational knowledge, campus environment, health awareness, living habits, time management, incentives and clubs, psychological stress, and family influence. The exploration of how these factors played a role in students' sports participation provides a theoretical basis and practical direction for promoting students' sustainable sports participation.

1. Educational and Knowledge Dimension

In the dimension of educational knowledge, the sports cultural atmosphere created by the school, the sports policies formulated, and the curriculum system set up all profoundly influenced students' enthusiasm and sustainability in participating in sports activities. The dissemination of rich sports knowledge and good educational guidance could effectively shape students' correct perception of sports, thus stimulating their enthusiasm for actively participating in sports activities. The following were specific related studies:

Wang (2024) discovered through research that the leadership style and teacher - student interaction mode in the school sports culture had an important impact on students' sports participation during the process of educational knowledge transfer. A positive and supportive cultural atmosphere could make students more enthusiastic when acquiring sports knowledge, thus inspiring them to participate in more sports activities.

Wang Hui (2023) focused on researching the impact of school sports policies on students' sports participation. The research results showed that reasonable sports policies and scientific physical education curriculum settings could provide students with more opportunities and guidance to participate in sports activities, significantly increasing the frequency of students' participation in sports activities. Especially under the incentive of policies, students' enthusiasm for participating in sports activities was greatly enhanced.

Li (2014) pointed out in the research that the school sports culture affected students' sports participation behavior by enhancing their sense of belonging and self - efficacy in learning sports knowledge. A positive sports atmosphere could encourage students to take the initiative to learn sports knowledge, stimulate their interest in participating in more sports activities, and thus improve their overall health level.

Sun Lingling (2005) emphasized the crucial role of school sports policies and curriculum settings in students' sports participation. Policies and courses that met students' individualized needs could accurately meet students' learning expectations during the process of educational knowledge imparting, significantly increasing students' willingness and actual effect of participating in sports activities.

2. Campus Environment Dimension

The campus environment dimension encompassed various elements such as sports hardware facilities, resources, and activity organization in schools and surrounding communities. These elements played a crucial role in students' enthusiasm and sustainability for participating in sports activities. High-quality campus sports facilities and rich community sports resources could not only provide students

with convenient sports conditions but also create a strong sports atmosphere, stimulating students' enthusiasm for participating in sports. The following were specific related studies:

Qiang (2023) showed that the organizational level of community sports activities was closely related to students' sports participation. Community sports activities with a high - level of organization could effectively stimulate students' interest in sports through diverse activity forms and professional guidance. At the same time, these activities could strengthen social interaction among students, improve their interpersonal communication skills, and thus promote students to actively participate in sports activities.

Chen Xuedong (2023) pointed out that the accessibility of community sports activities had a significant impact on students' exercise frequency. Convenient sports facilities within the community, such as fitness venues and equipment close to schools or students' residential areas, as well as a variety of activity items, like various fun sports meets and sports club activities, could attract students to go out of the classroom during their spare time and actively engage in physical exercise, increasing the frequency of their participation in sports.

Yin (2023) emphasized that the management quality and usability of school sports facilities were directly linked to students' health levels. Good facility management, including regular maintenance and reasonable opening - time arrangements, could ensure the normal use of facilities, improve the utilization rate of facilities, and at the same time reduce the risk of sports - related injuries for students. It created a safe and comfortable sports environment for students, encouraging them to participate in physical exercise more frequently and improve their physical fitness.

Xu (2009) found that the sports culture and resource support of the community had a positive impact on undergraduate students' sports participation. Especially for those students whose schools lacked sports facilities, the rich sports resources of the community, such as professional sports clubs and diverse sports events, became their main channels for participating in sports, making up for the

shortage of school sports resources and promoting students to continuously participate in sports activities.

3. Health and Awareness Dimension

In the dimension of health awareness, students' level of awareness of health, understanding and emphasis on the benefits of exercise were the key factors that influenced their enthusiasm and sustainability in participating in sports activities. The Theory of Planned Behavior and the Health Belief Model provided a powerful framework for explaining how these factors affected students' sports participation behavior. When students had a stronger sense of health and a deep understanding of the positive impacts of exercise on themselves, their willingness and actions to participate in sports activities would be significantly enhanced, which was of great significance for promoting students' sustainable participation in sports. The following were the specific research findings:

Wang Yuanli (2019) found that undergraduate students' perception of health directly affected their behavioral intentions. Based on the Theory of Planned Behavior, they emphasized the crucial role of attitude, subjective norms, and perceived behavioral control in the decision - making process of undergraduate students' health - related behaviors. That is, students' positive attitude towards health, the subjective norms formed by the surrounding environment, and their sense of control over participating in sports activities all influenced their decision to participate in sports.

Ye Chao (2013) pointed out that the higher the level of health awareness of undergraduate students, the greater the possibility of their participation in sports activities. At the same time, it was found that the perceived behavioral control in the Theory of Planned Behavior played an important role in regulating the relationship between health behavior and sports participation. If students believed that they had sufficient ability and conditions to participate in sports activities, then they were more likely to take action.

Zhang Ru (2010) studied the relationship between undergraduate students' health awareness and sports participation and found that health awareness was a powerful predictor of sports participation. In this process, they emphasized the role of subjective norms in the Theory of Planned Behavior. For example, when the social circle that undergraduate students were in had a positive attitude towards physical exercise, the possibility of their participation in sports activities increased significantly.

Li (2020) studied the impact of the understanding of the benefits of sports activities on sports behavior and found that a positive attitude towards sports and a strong behavioral intention were the keys to increasing undergraduate students' participation in sports. When students fully recognized that sports activities could bring many physical and psychological benefits, such as enhancing physical fitness and relieving stress, they were more motivated to participate in sports activities.

4. Living Habits Dimension

In the dimension of living habits, the daily living patterns and habits formed by students profoundly influenced their behavioral performance in participating in sports activities. Living habits such as regular work and rest, a reasonable diet, and long - term activity preferences not only shaped students' physical conditions but also, to a large extent, influenced their motivation and sustainability in participating in sports. Good living habits could provide a stable foundation and positive psychological cues for sports participation, while bad living habits might become obstacles. The following were the specific research situations:

An (2015) explored the application of the Self-Determination Theory in the field of sports. The research showed that when students, due to their own interest and enthusiasm for sports, actively integrated sports into their daily living habits, they would demonstrate higher perseverance in sports activities and have a healthier mental state. This meant that the sports participation habits formed under the drive of internal motivation played a crucial role in undergraduate students' sports participation. For example, students who loved running in their daily lives would participate in running activities more regularly.

Xiang Mingqiang (2013) Proposed the Self-Determination Theory (SDT), emphasizing the importance of internal motivation in individual behavior. When an individual participated in an activity based on inner interest and pleasure and gradually formed a habit, this behavior would be more persistent and autonomous. Applied to the field of sports, if undergraduate students were interested in a certain sport, such as basketball, and had fun while playing, they would more easily incorporate playing basketball into their daily living habits and participate in the long term.

Dong Yu (2011) found that conducted research on Chinese undergraduate students, it was found that internal motivation had a significant impact on undergraduate students' sports participation. Especially those students who participated in sports activities due to their interest and pleasure in sports itself were more likely to normalize sports activities, form good living habits, and also perform better in sports. For example, students who loved dancing and often participated in dance club activities not only had a high participation frequency but also continuously improved their dance skills.

Standage (2003) studied the motivation of British middle school students to participate in sports and found that students with high internal motivation were more inclined to actively participate in sports activities during their spare time, thus gradually developing the living habit of regular exercise. Their research results supported the Self-Determination Theory, indicating that interest in sports itself was an important factor that prompted students to participate in sports activities in the long term and form good living habits.

Shi Yaju (2002) conducted research on undergraduate students' internal motivation and sports participation and found that internal motivation was closely related to a positive sports attitude and participation behavior. It emphasized that cultivating students' interest and pleasure in sports helped them form the habit of participating in sports and increased the frequency of their long-term participation in sports activities. For example, by organizing fun sports activities, students could develop the living habit of exercising while having fun.

5. Time Management Dimension

In the dimension of time management, students' ability to plan and allocate time reasonably was one of the key factors influencing their participation in sports activities. Effective time management not only enabled students to strike a balance between academics and life but also created the necessary time conditions for participating in sports activities. Good time - management habits could enhance students' initiative and sustainability in participating in sports, while insufficient time - management ability might lead to sports activities being neglected or put on hold. The following were the specific research situations:

Block (2014) found that students' time - management ability significantly affected their sports participation behavior. Students with strong time - management ability were better at planning their schedules, setting aside stable time for sports activities, and could coordinate more effectively when facing time conflicts between study and sports activities, thus participating in sports activities more actively.

Li Jinying (2023) explored the relationship between undergraduate students' time - management ability and sports participation, and found that students with strong time - management ability showed higher enthusiasm and perseverance in sports participation. They could reasonably arrange training and competition times and were more likely to develop long - term regular physical exercise habits.

Wu Benlian (2016) showed that time - management ability not only affected undergraduate students' sports participation but also had a positive effect on their overall life satisfaction. Reasonably allocating time to participate in sports activities could not only improve physical fitness but also help students relieve study pressure and improve the quality of life. By enhancing time - management ability, the sports participation rate and mental health status of undergraduate students had been significantly improved.

Sun Yongjun (2008) studied the correlation between the time - management ability of Chinese undergraduate students and their sports participation. The results showed that time - management ability had a significant promoting effect on the motivation of undergraduate students to participate in sports activities, especially in

the choice of exercise frequency and exercise types. Students with strong time - management ability were more capable of choosing suitable sports projects according to their own interests and physical conditions and maintaining a stable exercise frequency.

Gao (2008) explored the role of time management in different sports environments. The research found that in an environment with good time - management guidance and support, the improvement of students' time - management ability was more significant, which in turn prompted them to participate in sports activities more actively. For example, by formulating a reasonable class schedule, schools could set aside fixed sports activity time for students, effectively guiding them to participate in physical exercise.

6. Incentive and Club Dimension

In the dimension of incentives and clubs, various incentive mechanisms and rich club activities had a non - negligible impact on students' enthusiasm and sustainability in participating in sports activities. Incentive measures from schools and within clubs, such as award - setting and honorary recognition, could effectively stimulate students' enthusiasm for sports participation. Diverse sports clubs, on the other hand, provided students with a broad participation platform, allowing them to enjoy the fun of sports in like - minded groups. These two factors interacted with each other and jointly promoted students to actively engage in sports activities. The following were the specific research situations:

Wu Moulin (2017) pointed out that peers and friends within the club played an important role in undergraduate students' sports activities. They not only participated in sports activities together to create a strong sports atmosphere but also, through emotional encouragement, prompted undergraduate students to develop long - term and stable exercise habits. For example, in a basketball club, members encouraged each other and trained together, which enabled everyone to be more active in persisting in basketball.

Pan Xiugang (2017) pointed out that the incentive measures given by schools and society and the development environment of clubs jointly acted on undergraduate students' decisions to participate in sports. When the incentive policies matched the sports atmosphere created by the clubs, undergraduate students had the strongest willingness to participate in sports activities. For instance, when a school set up sports scholarships and at the same time the club organized wonderful sports events, it could greatly stimulate students' enthusiasm for sports participation.

Chang Yanxiu (2012) indicated that the government's support policies for sports clubs and the creation of a social sports culture could significantly enhance the sports participation of undergraduate students. The guiding role of policies was very significant in the construction of sports club activity venues and the promotion of the club's characteristic sports activities. For example, the government funded undergraduates and universities to build professional club fitness venues, providing good conditions for clubs to carry out activities.

Chang Sheng (2008) discovered that family support for students to join sports clubs, especially parents' attitudes and participation, had an important impact on the formation of undergraduate students' sports exercise habits. Parents' encouragement could enhance undergraduate students' self - confidence and enthusiasm for participating in club sports activities. For example, when parents actively participated in the parent - child sports activities organized by school clubs, it could make children more willing to engage in club sports activities.

Andersen (1992) discussed the multi - level influence of family and friends on students' participation in sports clubs and found that both the cultivation of early sports interests in the family and the long - term support given by friends in club activities had a positive impact on undergraduate students' behaviors of participating in sports clubs. For example, if a family cultivated a child's sports interests from an early age, and after the child entered university, he or she joined a sports club driven by friends, it would be easier for the child to persist in participating in club sports activities.

7. Psychology and Stress Dimension

In the dimension of psychology and stress, students' psychological states and the ways they coped with stress played a crucial role in their enthusiasm and sustainability in participating in sports activities. Positive psychological cognition, good emotional regulation ability, and the psychological satisfaction obtained from sports activities could not only help students relieve the stress brought about by academics and life but also stimulate their enthusiasm for actively participating in sports activities. On the contrary, negative psychological states and excessive stress might become obstacles to students' participation in sports. The following were the specific research situations:

Chen (2023) founded that the sense of competence in sports activities was one of the important motivations for undergraduate students to continuously participate in sports. Feeling a sense of achievement and ability improvement in sports activities could enhance students' willingness and persistence in participating in sports activities. For example, students who continuously improved their dance levels and got performance opportunities by participating in dance clubs would be more willing to continuously participate in dance activities.

Jiang Zhihua (2021) proposed that there was a significant positive correlation between an individual's sense of autonomy in sports activities and long - term participation. For students, having more autonomy in choosing exercise time and project types could greatly enhance their internal motivation to participate in sports activities and make their participation more stable. For example, if students could independently decide to practice yoga after class instead of being forced to do certain sports, they were more likely to stick to it in the long run.

D'Abundo (2015) explored the role of students' sense of competence in sports activities in their sports participation and found that the improvement of students' sports abilities was closely related to their sports self - efficacy and internal motivation. When students continuously made progress in learning sports skills, such as becoming more and more proficient in basketball skills, they would be more

confident in their participation in sports activities and their internal motivation would also be stronger.

Zhang Wang (2007) through a survey of Chinese undergraduate students, the research found that experiencing a sense of competence and achievement in sports activities could enhance students' enthusiasm for participating in sports activities and also had a positive effect on promoting their physical and mental health. When students won awards or broke their own records in track and field competitions, they would have a greater love for track and field sports, and their physical and mental states would also be improved.

8. Family Influence Dimension

In the dimension of family influence, the atmosphere created by the family, the behavior patterns of family members, and their attitudes towards sports, all acted like invisible forces, profoundly influencing students' enthusiasm and sustainability in participating in sports activities. As the primary environment for students' growth, the degree of importance a family attached to sports, whether they actively participated in sports activities, etc., could subtly shape students' perception of sports and their willingness to participate. A good family sports atmosphere could stimulate students' enthusiasm for actively participating in sports and lay a solid foundation for their sustainable sports participation. However, a family's neglect or negative attitude towards sports might become an obstacle to students' participation in sports. The following were the specific research situations:

Zhao Xiaoxiao (2024) showed that the sports behaviors of Chinese undergraduate students were greatly influenced by the family sports atmosphere. When there were family members who often participated in sports activities, such as parents who regularly ran or worked out, students, being influenced by what they saw and heard in such an environment, were more inclined to imitate these behaviors. In an environment with a strong campus sports culture, this imitation behavior became more prominent, and the frequency and enthusiasm of their participation in sports activities also increased accordingly.

Karada (2018) pointed out that students could further stimulate their own interest in sports by observing the sports habits of family members, especially when they saw the fun their family members got from sports and the emotional warming among family members brought about by sports interactions. Sports interactions within the family, such as parent - child basketball games, family hiking activities, etc., could enable students to feel the cohesion of family affection and the joy of sports, thus enhancing their willingness to participate in sports.

Sun (2018) explored the role of the family in guiding students to participate in sports and found that students would motivate themselves to actively engage in sports activities by watching campus sports events that the family jointly participated in or supported, and by imitating the behaviors of sports idols recognized by the family. Especially when the family watched competitive sports events with the students and cheered for their favorite athletes, the students were more strongly influenced, and their imitation behaviors of participating in sports activities were also more obvious.

Pan Zhixian (2005), in a study on undergraduate students' sports participation, found that observation of family members' behaviors and behaviors of sports coaches hired by families enables acquisition of practical sports skills. Moreover, under the guidance of families' positive attitudes, correct perceptions and positive attitudes toward sports can be established, thereby increasing the frequency of participation in sports activities. For instance, when parents enroll children in swimming classes, observation of supportive behaviors from coaches and parents leads to greater willingness among children to actively participate in swimming training.

In summary, students' sustainable sports participation was influenced by a multitude of key factors across various dimensions. The educational and knowledge dimension highlighted the significance of school - created sports culture, policies, and curriculum in shaping students' sports enthusiasm. The campus environment dimension emphasized the role of sports facilities, community resources, and activity organization. Health awareness, living habits, time management, incentives and clubs,

psychological stress, and family influence each contributed uniquely to students' sports participation. While a positive health perception, good living and time - management habits, effective incentives, and a supportive family environment promoted continuous sports engagement, negative factors in these areas could act as barriers. Understanding these factors provided a comprehensive theoretical foundation and practical guidance for promoting students' sustainable sports participation, facilitating the formulation of targeted strategies to encourage long - term and active involvement in sports among students.

Table 2.2 Key Factors Affecting Students' Sustainable Sports Participation

Influencing Dimensions	Core Influencing Factors	Key Research Conclusions (Examples)
Educational and Knowledge Dimension	School sports cultural atmosphere, sports policies, curriculum system	A positive sports culture can enhance students' participation enthusiasm (Wang, 2024); reasonable policies increase participation frequency (Wang Hui, 2023)
Campus Environment Dimension	Sports hardware facilities, community sports resources, activity organization level	Highly organized community activities can stimulate interest (Qiang, 2023); facility usability is related to health levels (Yin, 2023)
Health Awareness Dimension	Health cognition level, understanding of exercise benefits	Stronger health awareness leads to higher participation possibility (Ye Chao, 2013); deeper understanding of exercise benefits strengthens participation willingness (Xu, 2019)
Living Habits Dimension	Daily work and rest, diet, long-term activity preferences	Exercise habits driven by internal motivation are more persistent (An, 2015); interests promote the formation of regular exercise habits (Xiang Mingqiang, 2013)

Table 2.2 (Continued)

Influencing Dimensions	Core Influencing Factors	Key Research Conclusions (Examples)
Time Management Dimension	Time planning and allocation ability	Students with strong time management ability participate more actively (Block, 2014); can improve participation enthusiasm and perseverance (Li Jinying, 2023)
Incentive and Club Dimension	Incentive mechanisms (rewards, honors), club activities, peer influence	Peer encouragement in clubs promotes long-term exercise (Wu Moulin, 2017); matching policies with club atmosphere enhances participation willingness (Pan Xiugang, 2017)
Family Influence Dimension	Family sports atmosphere, members' sports behavior, attitudes	Family sports behavior affects students' imitation (Zhao Xiaoxiao, 2024); parent-child sports interaction improves participation willingness (Karada, 2018)
Psychology and Stress Dimension	Autonomy, sense of competence, emotional regulation ability	Stronger exercise autonomy leads to more stable participation (Jiang Zhihua, 2021); improved ability enhances participation motivation (D'Abundo, 2015)

Undergraduate Students

Undergraduate students were a special group different from other social members. Therefore, this study specifically elaborated on the definition and characteristics of undergraduate students as follows:

Definition of Undergraduate Students

"University" was in contrast to "primary school". It meant that it was not about "detailed explanations of words and punctuation" like in primary school, but about "governing and stabilizing the country" like in university. Undergraduate students should have learned the way of "university" and strived to shape themselves into individuals with certain abilities to "govern and stabilize the country".

Qiu Guoliang and Zhan Jia (2023) defined undergraduate students in the context of the new era, stating that they are representatives of people of the new era who shoulder the historical mission of realizing the great rejuvenation of the Chinese nation. They emphasized that undergraduate students should be cultivated into useful talents for the development of socialist undertakings, which means internalizing the striving spirit and externalizing it into practical actions under the background of new changes in social development to promote national rejuvenation.

Fan Minghua (2022) put forward a perspective on the definition of undergraduate students in terms of cultivating their feelings of family and country. He believed that undergraduate students refer to those who should develop feelings of family and country, which not only include love for the country and the nation but also manifest as a sense of responsibility for family and society. Through the edification of traditional culture, undergraduate students should establish a sense of family and country and shoulder the heavy responsibilities entrusted by the times.

Shi Jianqiao (2022) defined undergraduate students from the perspective of education on their view of a better life. He stated that undergraduate students are those who need to receive education on the view of a better life in the new era, which aims to cultivate their correct outlook on life, values, and worldviews. This means that through the education of socialist core values, undergraduate students can form scientific life cognition and be guided to pursue and realize a better life for individuals and society.

Sun Na (2019) defined undergraduate students in the context of mental health education, pointing out that they are the target group of mental health education, which is an important part of ideological and political education. Undergraduate students, in this sense, refer to people of the new era who are to be cultivated into responsible individuals for national rejuvenation. Mental health education for them not only promotes the coordinated development of their ideological and moral qualities and scientific and cultural qualities but also enriches the theoretical characteristics of China's philosophy and social sciences.

Ren Yu (2016) defined undergraduate students as the core objects of ideological and political education. They emphasized that undergraduate students are those who need to be guided by optimizing the discourse system of ideological and political education, which is meant to enhance the discourse power of mainstream ideology. This means helping undergraduate students firmly establish correct ideological beliefs to deal with the challenges of wrong ideological trends such as online populism and money worship.

To sum up, in this research, the concept of undergraduate students referred to individuals pursuing bachelor's degrees in higher education institutions, whose good health and well-being involves three interconnected dimensions-Physical Wellbeing sustained through sustainable sports participation (long-term sports involvement supported by a favorable campus environment, incentives, balanced time management, and tech-integrated healthy habits), Mental Wellbeing fostered by exercise's stress relief and good health education (with mental health content via engaging educators) to build health awareness and lifestyles, and Social Wellbeing nurtured through social integration via health education (with social health content), a sense of belonging from sports clubs, and family support/health guidance-all interacting to shape their overall well-being and underpin holistic development.

Characteristics of Undergraduate Students in sports participation

Contemporary undergraduate students exhibit distinct characteristics in sports participation, which are manifested as follows:

Zhou Shaolin (2024) found in their research that there was a significant correlation among variables such as sports participation, embodied cognition, and all - round physical and mental development. Sports participation had a positive impact on improving undergraduate students' embodied cognition and the all - round physical and mental development of undergraduate students. Moreover, embodied cognition played a partial mediating role in the relationship that affected the all - round physical and mental development of undergraduate students.

Wang (2024) explored the potential of cultivating, integrating, and optimizing physical literacy to improve the quality of life. Progress could be made by acquiring

the tendency to move and participate in physical activities, but the data supporting this view was still limited. This cross - sectional study attempted to empirically study these two variables by assessing the motivation and satisfaction levels of Taiwanese undergraduate students.

Qi (2023) showed that undergraduate students' emphasis on career development was increasing. They actively participated in internships and social networks to accumulate workplace experience. Mental health problems were increasingly prominent among undergraduate students, especially when facing academic and employment pressures. Family support played a key role in maintaining undergraduate students' mental health.

Guo Jianpeng (2023) pointed out in the research that the learning pressure and mental health problems of Chinese undergraduate students had gradually become research hotspots, especially during the epidemic. There was a significant positive correlation between academic burnout and excessive learning pressure. The research suggested that schools should provide more psychological counseling and support. undergraduate students' self - efficacy significantly affected their academic performance. Higher self - efficacy helped relieve academic pressure.

Li (2013) found in their research that undergraduate students' learning motivation showed a diversified trend. Some students paid more attention to academic achievements, while some paid more attention to personal interests and career development. With the increase of employment pressure, undergraduate students' academic pressure was also rising, especially among Chinese undergraduate students. When undergraduate students coped with pressure, mental health problems such as anxiety and depression increased.

To sum up, contemporary undergraduate students had the following distinct characteristics: First, in terms of academics and career development, learning motivation was diversified, including the pursuit of academic achievements, personal interests, and career planning. They paid great attention to career development and actively accumulated workplace experience. At the same time, they faced greater academic pressure, which was more significant among Chinese undergraduate

students. Second, in terms of mental health, due to academic and employment pressures, psychological problems such as anxiety and depression increased. Family support was crucial for maintaining their mental health. Third, in terms of sports and exercise, attitudes towards sports varied in multiple dimensions. Sports could not only enhance physical fitness, promote health, and lower blood pressure, but also relieve stress and anxiety. In short, undergraduate students showed complex characteristics and needs in these aspects. Academics, psychology, and health interacted with each other. Schools, families, and society needed to integrate resources and provide comprehensive support and guidance to promote their all-round development.

Related Research

Related research on undergraduate students' sustainable sports participation and health education management strategies has explored key influencing factors, theoretical foundations, and practical approaches, providing important references for the current study.

Chang (2024) conducted research on the topic of the impact of undergraduate students' mental health problems on their sports participation willingness. With the objective of exploring the relationship between psychological factors and sports engagement among undergraduates, the sample group was undergraduate students. The research results found that undergraduate students with severe psychological problems (such as anxiety and depression) usually lacked the motivation and energy to participate in sports activities, and although sports were considered an effective way to relieve stress, they had not been widely recognized or applied by this group.

Yang (2023) conducted research on the topic of factors affecting American undergraduate students' sports participation. With the objective of identifying key barriers to sports engagement among undergraduates, the sample group was American undergraduate students. The research results found that economic factors were an important obstacle: high costs of sports equipment and gym membership

fees hindered participation among students with poor economic conditions; in addition, insufficient time management ability also led many undergraduates to give up sports activities.

Xie (2012) conducted research on the topic of factors influencing Chinese undergraduate students' sports participation. With the objective of exploring cognitive and environmental factors affecting sports engagement, the sample group was Chinese undergraduate students. The research results found that Chinese undergraduates had cognitive biases about sports (e.g., believing sports wasted time or lacking understanding of their health benefits), which reduced their willingness to participate; meanwhile, a lack of peer motivation and a weak campus sports culture also significantly limited their sports participation.

World Health Organization (WHO) (2020) conducted research on the topic of the relationship between adolescent and undergraduate students' sports participation and health outcomes. With the objective of verifying the health value of sports participation for young people, the sample group included adolescents and undergraduate students globally. The research results found that increasing sports participation could effectively reduce the risk of non-communicable diseases (such as obesity and heart disease) and improve mental health; it also emphasized that strengthening policy implementation for youth sports activities was crucial to promoting long-term health.

Zhou (2020) conducted research on the topic of factors affecting Chinese undergraduate students' sports participation. With the objective of analyzing the impact of academic and environmental factors on sports engagement, the sample group was Chinese undergraduate students. The research results found that academic pressure was a key factor: as course difficulty and exam pressure increased, students struggled to balance learning and sports; in addition, insufficient school sports facilities and lack of social support also hindered their participation in sports activities.

Xiang (2020) conducted research on the topic of the characteristics of good health education. With the objective of defining effective health education that

could promote healthy behaviors, the sample group included educational institutions and students. The research results found that good health education must have a sound content management system, clear and measurable goals, and adopt modern management methods (such as digital libraries) to improve resource accessibility, which laid a foundation for formulating health education strategies.

Han (2020) conducted research on the topic of the content system of good health education. With the objective of exploring the components of high-quality health education, the sample group involved educational experts and students. The research results found that good health education required a comprehensive content system (including mental health education) and should keep pace with the times (e.g., incorporating knowledge of telemedicine and wearable devices), which provided a reference for designing health education strategies related to sports.

Wu (2017) conducted research on the topic of health promotion in education. With the objective of exploring how education could foster lifelong healthy behaviors, the sample group covered learners of all ages. The research results found that health promotion in education should integrate strategies, environments, and curricula to cultivate holistic well-being (physical, mental, emotional, and social), and physical activity was a key lever in this process, which supported the integration of sports into health education strategies.

Wu (2017) conducted research on the topic of the relationship between physical activity and mental health. With the objective of verifying the psychological benefits of sports participation, the sample group included young people. The research results found that physical activity alleviated stress and anxiety by boosting endorphins, which provided theoretical support for developing sports strategies aimed at improving mental health and promoting sustainable sports participation.

Zhou (2015) conducted research on the topic of the evaluation and adjustment of health education strategies. With the objective of improving the effectiveness of health education, the sample group included educational institutions and students. The research results found that health education strategies required regular evaluation and adjustment based on new research and stakeholder feedback,

which provided a methodological reference for evaluating the adaptability and feasibility of sports-related health education strategies.

To sum up, existing related research has identified multiple factors affecting undergraduate students' sustainable sports participation, including psychological state, economic conditions, academic pressure, and cognitive biases, while also clarifying the characteristics and implementation requirements of effective health education. These findings provide theoretical support and practical references for studying the current situation of undergraduate students' sports participation, developing targeted health education management strategies, and evaluating the adaptability and feasibility of such strategies.

Chapter 3

Research Methodology

This study aimed to 1) study the current conditions and desired conditions that enhance sustainable sports participation among undergraduate students; 2) develop good health educational management strategies for enhancing sustainable sports participation among undergraduate students; 3) evaluate the feasibility and adaptability of the good health educational management strategies for enhancing sustainable sports participation among undergraduate students. Through a three-phase research process. This study employed a mixed-methods research design. Each phase focused on studying the current and desirable conditions, developing effective health education management strategies, and evaluating the feasibility and adaptability of these strategies.

Phase 1: Studying the current situation and desired conditions that enhance sustainable sports participation among undergraduate students.

Phase 2: Developing good health educational management strategies enhancing sustainable sports participation of undergraduate students.

Phase 3: Evaluating the feasibility and adaptability of the proposed good health educational management strategies in promoting sustainable sports participation among undergraduate students.

To achieve the above research goals, the researcher adopts the following research procedures:

1. The population / Sample Group
2. Research Instruments
3. Data collection
4. Data analysis

Phase 1: Studying the current situation and desired conditions that enhance sustainable sports participation among undergraduate students.

The population / Sample Group

The Population

According to the latest statistics of the Ministry of Education of China, there were 47.63 million undergraduate students currently enrolled in 1,308 colleges and universities across China. The aim was to understand their level of sports participation.

The Sample group

The researcher determined the sample size using Krejcie and Morgan's table (1970), resulting in a total of 384 undergraduate students as the required sample. Stratified random sampling techniques were applied to ensure proportional and representative participation across different subgroups within the population. For this study, stratification was based on two key criteria:

1. Geographical Regions: Colleges and universities were categorized according to their locations across different regions, including urban and rural areas as well as different provinces, to capture geographical diversity.
2. Institutional Types: Institutions were further classified based on their characteristics, such as public and private universities and specialized colleges, to reflect the diversity of higher education environments.

Within each stratum, students were selected using stratified random sampling to participate in the survey, ensuring balanced representation from various regions and institution types. This approach aimed to increase the validity of the findings and provide comprehensive insights into the current conditions, desired conditions, and supporting factors for enhancing sustainable sports participation among undergraduate students.

Table 3.1 Sample quantity table for questionnaire survey (students)

NO	School name	Region/ reason	Population	Questionnaire survey Sample group
1	Shenzhen University of Technology	South	5041	12
2	Honghe University	South	12995	31
3	Soochow University	Central	27844	67
4	Anqing Normal University	Central	17823	43
5	Tarim University	West	26680	64
6	Lanzhou University of Technology	West	22326	54
7	Shihezi University	West	22500	54
8	Taiyuan University of Technology	Northeast	10937	26
9	Shenyang Sport University	Northeast	5185	13
10	Shaanxi University of Chinese Medicine	Northeast	8129	20
Total			159460	384

Interviewees

For this study, 16 physical education teachers and educational administrators from 10 colleges and universities were selected as interviewees. The target group was selected using purposive sampling. The selection criteria for interview experts are as follows: (1) Possess a master's degree or above; (2) Have worked in institutions of higher learning for more than 10 years. (3) Be expert scholars with rich experience in the fields of educational management, physical education, or psychological research on undergraduate students and have in-depth research and understanding of undergraduate students' sports participation.

Research Instruments

The research Instruments used in this stage include literature research, questionnaires, and interview forms.

1. Questionnaire Survey

The research tool at this stage was mainly a structured questionnaire survey. The design of the questionnaire was based on relevant domestic and international literature and referred to relevant theoretical frameworks such as Maslow's hierarchy of needs theory and self-determination theory. The content of the questionnaire had been reviewed and revised by experts to ensure its validity and reliability. The questionnaire design was divided into the following sections:

1) Personal information: Covers basic information such as the gender, age, grade, and major of the respondents.

2) Current status of sports participation: Included the frequency of sports per week, the duration of a single sports activity, the types of sports participated in (such as running, basketball, swimming, etc.), and the places where sports were participated in (such as school stadiums, gyms, etc.).

3) Explored the factors influencing students' sports participation: Included academic pressure, sports facilities, economic status, mental health, time management, sports cognition, campus culture, and satisfaction with campus sports facilities. The questionnaire used a five - point Likert (1932) scale, with a scoring range from 1 to 5 to evaluate the intensity of respondents' sports motivation, such as health consciousness, social needs, hobbies, etc., and at the same time identified the main obstacles affecting sports participation, such as lack of time, venue restrictions, lack of partners, etc.

4.50 - 5.00 indicates the highest level.

3.50 - 4.49 indicates a relatively high level.

2.50 - 3.49 indicates a moderate level.

1.50 - 2.49 indicates a relatively low level.

1.00 - 1.49 indicates the lowest level.

The questionnaire design process included the following steps:

Step 1: Reviewed and analyzed domestic and international literature on undergraduate students' sports participation and designed a preliminary questionnaire.

Step 2: Submitted the first draft of the questionnaire to the research supervisor for review and revised the questionnaire content according to the feedback.

Step 3: Invited five experts to evaluate the Index of Objective Congruence (IOC) (Brian Foote, 1988) of the questionnaire. The IOC value was 0.60 - 1.00.

Step 4: Further revised the questionnaire according to the experts' suggestions.

Step 5: Selected 30 students from Shaanxi International Business College to conduct a questionnaire pilot test and measured the reliability of the questionnaire through Cronbach's Alpha coefficient. The expected target value of the questionnaire reliability coefficient was 0.85. The reliability distinction standards were as follows:

0.9 - 1.0: High reliability.

0.8 - 0.9: Good reliability.

0.7 - 0.8: Acceptable reliability.

0.7 - 0.1: Low reliability.

Step 6: Conducted a questionnaire survey on 384 students from 10 undergraduates and universities and waited for data collection.

2. Interview Design

Based on the questionnaire survey results and the analysis of the current status of undergraduate students' sports participation, in order to further explore the deep - seated factors affecting undergraduate students' sports participation, this study designed a structured interview outline. The interviewees were 16 physical education teachers and educational administrators selected from 10 colleges and universities. The purpose was to find educational management strategies for sustainable development that could enhance undergraduate students' sports participation.

The structured interviews were divided into two parts:

Part 1: Personal information of the interviewees, classified by the interviewees' professional titles, positions, educational backgrounds, years of work, interview time, and interview date.

Part 2: Suggestions were given from the following three aspects: (1) The main obstacles to undergraduate students' participation in sports at that time; (2) Whether the school's measures to promote sports were effective; (3) How to further increase students' enthusiasm and continuity in participating in sports.

The construction process of the structured interviews was as follows:

1) Relevant literature, concepts, theories, and research on promoting the sustainable development of undergraduate students' sports participation were consulted and analyzed.

2) Suggestions on the current status of the integration of production and education in higher vocational undergraduates were put forward from three aspects through structured interviews: (1) Evaluation of the current status of undergraduate students' sports participation; (2) The influence of educational management on sports participation; (3) How to further increase students' enthusiasm and continuity in participating in sports. Then the structured interview outline was submitted to the thesis supervisor for review, and the content was revised according to the suggestions.

3) Three experts checked the interview content, and the interview content was revised according to the experts' suggestions.

Data Collection

1. Questionnaire data collection

1) After the experts had reviewed the questionnaire, the researcher tested the questionnaire with 30 undergraduate students at Shaanxi International Business College and revised the questionnaires to make it more complete.

2) The researcher distributed questionnaires to 384 students from 10 colleges and universities to ensure a 100% questionnaire recovery rate.

2. Interview data collection

1) The researcher asked the invitation letter for an expert interview from Graduate School of Bansomdejchaopraya Rajabhat University to send invitations to

collect interview data from 16 physical education teachers and educational administrators selected from 10 colleges and universities.

2) The researcher sent invitations to interviewees who provided strategies.

3) The researcher conducted interviews with 16 participants, with each interview lasting no less than 30 minutes. The researcher conducted in-depth interviews with 16 participants and recorded the interview content through audio recording and note-taking.

4) After the interview, the data will be sorted and analyzed to ensure 100% recovery of 16 interview forms.

Data Analysis

The researcher analyzed the data through SPSS software as follows to study the current level of sports participation of undergraduate students:

1. Frequency and percentage analysis

First, the researcher classified the personal information of the questionnaire respondents, including variables such as gender, grade, and major. Through frequency and percentage analysis, the researcher can understand the basic distribution of students of different genders, grades, and majors in sports participation. This provides basic data for subsequent in-depth analysis.

2. Descriptive statistical analysis

Descriptive statistical methods were used to process the questionnaire data. The researcher calculated the mean and standard deviation of each sports participation variable. Through these statistical data, we can preliminarily understand the overall level, participation frequency of undergraduate students' sports participation and its distribution among different student groups.

3. Content analysis

Content analysis was conducted on the interview data. The researcher sorted, extracted and summarized the main influencing factors of undergraduate students' sports participation. Content analysis not only reveals the common problems of sports participation but also further proposes specific factors affecting undergraduate

students' sports participation, such as time pressure, facility conditions, and peer influence, based on previous research.

Phase 2: Developing good health educational management strategies aimed at enhancing sustainable sports participation of undergraduate students.

Target Group

1) The target group included 12 key informants (directors or deputy directors of sports departments and managers of relevant departments). They were from colleges and universities in different regions, had made significant contributions to enhancing the sustainable sports participation of undergraduate students, and had more than 10 years of experience in the field of undergraduate physical education.

2) These key informants had performed outstandingly in formulating and implementing educational management strategies for sustainable sports participation of undergraduate students and possessed corresponding professional knowledge and practical experience.

3) They had achieved reasonable results in their work of enhancing undergraduate students' sports participation and were widely recognized in related fields. These key informants, selected through purposive sampling techniques, had provided valuable insights and suggestions for this study. The following was the sampling data table of the focus group.

Research Instruments

The primary research instrument for this phase was a Focus Group Discussion Guide, designed to facilitate interactive group dialogue among 12 expert informants. The guide consisted of semi-structured, open-ended questions aimed at generating strategic ideas for enhancing sustainable sports participation through educational management. The questions were derived from the findings in Phase 1 and supported by relevant literature and theoretical frameworks in educational management and health promotion.

The development of the discussion guide followed these steps:

1. Reviewed empirical studies and international policy frameworks related to sports participation, good health education, and university governance.
2. Formulated open-ended questions based on eight key thematic areas identified in Phase 1.
3. Validated the content of the discussion guide through expert review by three professionals in educational management and health promotion.
4. Refined the wording and sequencing of questions to ensure clarity and promote balanced participation during the focus group discussion.

All focus group discussions were audio-recorded (with participant consent), and key points were summarized using field notes for further content analysis.

Data Collection

Data were collected through focus group discussions, with the researcher acting as the moderator.

Step 1: Contacted key informants to confirm the researcher's identity and research intention.

Step 2: Arranged interviews through email or other communication methods and sent relevant questions in advance for preparation.

Step 3: Conducted focus group discussions, collected the insights of key informants, and summarized the discussion content and specific data.

Data Analysis

The data from focus group discussions were analyzed through content analysis. After data collection was completed, the researcher sorted and analyzed the collected data. The theme of this focus group discussion was to formulate strategies to enhance the sustainable sports participation of undergraduate students. Based on the principles of freedom and voluntariness, key informants spoke freely in the discussion and provided directions for strategy formulation. The researcher analyzed according to the research goal of the second stage (formulating strategies

to enhance the sustainable sports participation of undergraduate students) and on this basis provided new ideas and suggestions for the management strategy of undergraduate students' sustainable sports participation.

Phase 3: Evaluating the feasibility and adaptability of the proposed good health educational management strategies in promoting sustainable sports participation among undergraduate students.

Target Group

The target group included five experts and scholars from universities in Thailand and China. These experts were selected through purposive sampling methods according to the following criteria:

- 1) Having had more than 5 years of work experience in related fields (educational management, physical education).
- 2) Having had practical operational experience and theoretical research ability in evaluating educational management strategies.

These key informants played an important role in the third stage of the research by evaluating the feasibility and adaptability of established strategies.

Research Instruments

Evaluation Form

To collect data in the third stage of this study, the researcher designed an evaluation form to assess the feasibility and adaptability of educational management strategies for undergraduate students' continuous sports participation. The data interpretation of the evaluation form was based on the average value interpretation standard proposed by Rensis Likert (1932), as follows:

4.50 - 5.00 indicated that the feasibility and adaptability of the strategy reached the highest level;

3.50 - 4.49 indicated that the feasibility and adaptability of the strategy reached a relatively high level;

2.50 - 3.49 indicated that the feasibility and adaptability of the strategy were at a medium level;

1.50 - 2.49 indicated that the feasibility and adaptability of the strategy were at a relatively low level;

1.00 - 1.49 indicated that the feasibility and adaptability of the strategy reached the lowest level.

Data Collection

Data collection at this stage focused on evaluating the feasibility and adaptability of these educational management strategies in promoting undergraduate students' continuous sports participation. The specific steps were as follows:

In the first step, the researcher sent request letters through the graduate school of his/her university to five experts and scholars from universities in Thailand and China, inviting them to participate in data collection.

In the second step, the researcher distributed the evaluation form to these five administrators and ensured that all participants completed and returned the evaluation form on time.

Data Analysis

The researcher analyzed the collected evaluation form data by calculating the average value and standard deviation. These analyses were used to evaluate the feasibility and adaptability of educational management strategies for undergraduate students' continuous sports participation, thus providing a basis for further optimizing and implementing these strategies.

Summary

This study employed a mixed-methods design, integrating both quantitative and qualitative research approaches, and was structured into three distinct phases:

Phase 1: Studying the current situation and desired conditions that enhance sustainable sports participation among undergraduate students.

In this initial phase, the research focused on assessing the current level of sports participation among undergraduate students, identifying existing challenges, and defining the desirable conditions that could foster sustainable participation. The

findings from this phase established the foundational data necessary for the subsequent phases.

Phase 2: Developing good health educational management strategies for enhancing sustainable sports participation of undergraduate students.

Based on the insights gained in Phase 1, this phase involved the formulation of targeted educational management strategies. These strategies were designed to address the identified gaps and promote sustainable sports participation among undergraduate students, considering both health and educational perspectives.

Phase 3: Evaluating the feasibility and adaptability of the proposed health educational management strategies.

In the final phase, the study evaluated the feasibility and adaptability of the newly developed strategies through expert assessments and practical applications. This phase aimed to determine the effectiveness of the strategies in real - world settings, providing a scientific basis for their broader implementation and future refinement.

This three-phase approach ensured that the research not only developed evidence-based strategies but also rigorously tested their practical impact, thereby offering a comprehensive framework for enhancing sustainable sports participation among undergraduate students.

The specific research methods were presented in the following framework diagram.

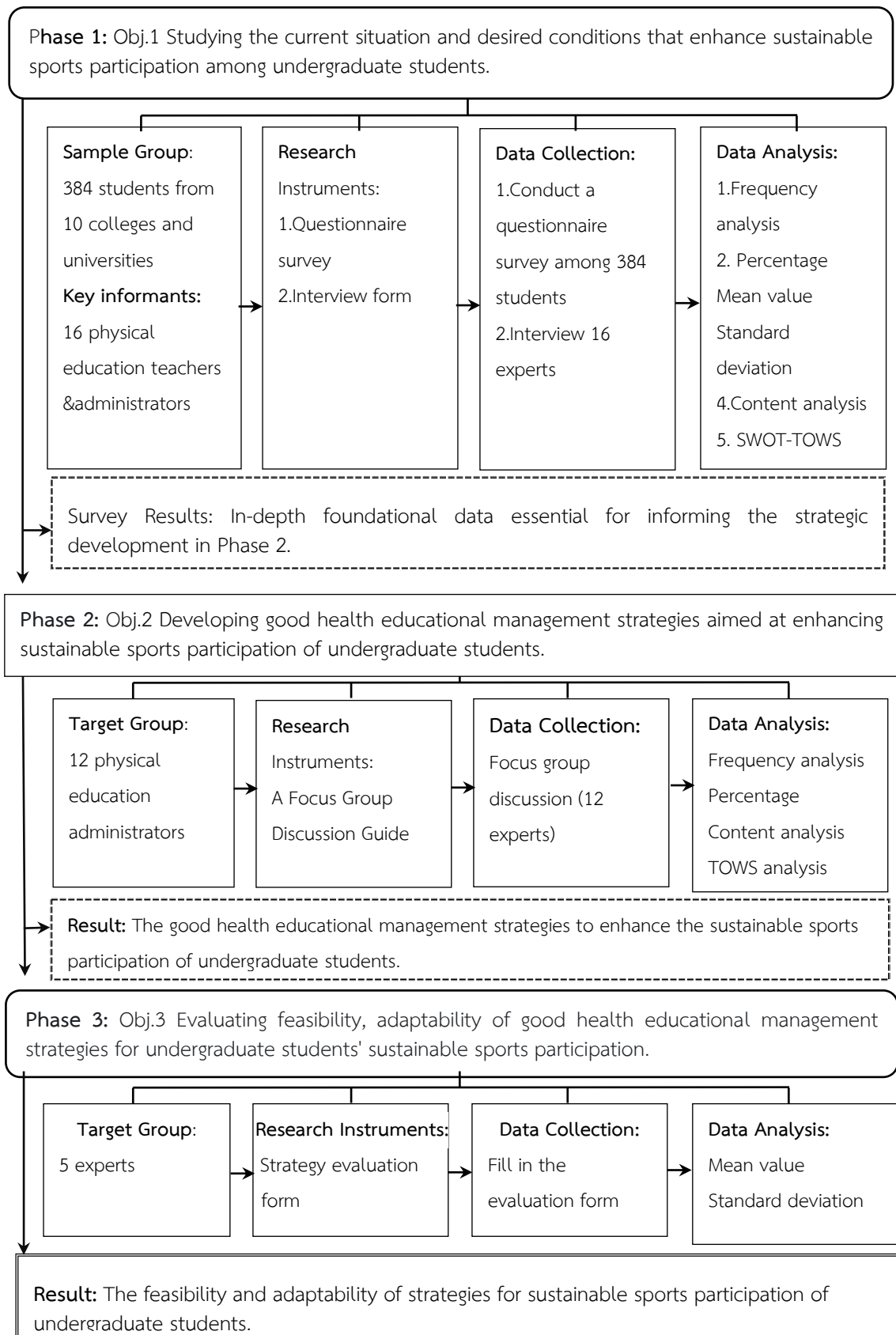


Figure 3.1 Research methods framework diagram

Chapter 4

Results of Analysis

According to the research on good health educational management strategies for enhancing sustainable sports participation of undergraduate students, the research objectives were as follows: 1) To study the current situation and desired conditions of enhancing sustainable sports participation of undergraduate students, as well as the supporting factors for promoting sustainable development. 2) To develop the strategies for enhancing sustainable sports participation of undergraduate students. 3) To evaluate the feasibility and adaptability of the strategies for enhancing sustainable sports participation of undergraduate students. The samples and target group consisted of 384 undergraduate students for questionnaire survey 16 teachers and education administrators for interview, 12 experts for focus group discussion, and 5 experts for evaluation. The stratified random sampling method and questionnaire survey method were employed to study the current situation and desired conditions of sports participation ability of undergraduate students in different regions and the supporting factors for promoting sustainable development. The relevant research data was divided into three sections as follows:

1. Results of studying the current situation and desired conditions of enhancing sustainable sports participation of undergraduate students.

1.1 Analysis of Personal information of undergraduate students, including school, grade, gender.

1.2 Analysis of the questionnaire information on the current situation and desired conditions of enhancing sustainable sports participation of undergraduate students.

1.2.1 Analysis of total: educational and knowledge dimension, campus environment dimension, health and awareness dimension, living habits dimension,

time management dimension, incentive and club dimension, psychology and stress dimension, family influence dimension.

1.2.2 Analysis of educational and knowledge dimension.

1.2.3 Analysis of campus environment dimension.

1.2.4 Analysis of health and awareness dimension.

1.2.5 Analysis of living habits dimension.

1.2.6 Analysis of time management dimension.

1.2.7 Analysis of incentive and club dimension.

1.2.8 Analysis of psychology and stress dimension.

1.2.9 Analysis of family influence dimension.

1.3 Analysis of the results of interview.

2. Results of development the good health educational management strategies for enhancing sustainable sports participation of undergraduate students.

2.1 Taking results of analysis of development of the good health educational management strategies for enhancing sustainable sports participation of undergraduate students to develop strategies.

2.1.1 SWOT and TOWS Matrix of educational and knowledge dimension.

2.1.2 SWOT and TOWS Matrix of campus environment dimension.

2.1.3 SWOT and TOWS Matrix of health and awareness dimension.

2.1.4 SWOT and TOWS Matrix of living habits dimension.

2.1.5 SWOT and TOWS Matrix of time management dimension.

2.1.6 SWOT and TOWS Matrix of incentive and club dimension.

2.1.7 SWOT and TOWS Matrix of psychology and stress dimension.

2.1.8 SWOT and TOWS Matrix of family influence dimension.

2.1.9 SWOT and TOWS Matrix of total.

2.1.10 SWOT and TOWS Matrix analysis results of Interview content.

2.2 Analysis of focus group discussion.

2.2.1 Analysis of status information statistics of Interviewee (Expert).

2.2.2 Good health educational management strategies derived from the focus group discussion.

2.2.3 Good health educational management strategies for enhancing undergraduate students' sustainable sports participation.

2.3 Summary of strategies.

3. Results of evaluating the feasibility and adaptability of the good health educational management strategies for enhancing sustainable sports participation of undergraduate students.

3.1 Analysis of evaluating the feasibility and adaptability of the good health educational management strategies for enhancing sustainable sports participation of undergraduate students.

Results of studying the current situation and desired conditions of enhancing sustainable sports participation of undergraduate students.

1.1 Analysis of Personal information of undergraduate students, including school, grade, gender. The details were below:

Table 4.1 Analysis of personal information

	Personal information	Number of people	Percentage (%)
School	Shenzhen University of Technology	12	3.13
	Honghe University	31	8.07
	Soochow University	67	17.45
	Anqing Normal University	43	11.20
	Tarim University	64	16.67
	Lanzhou University of Technology	54	14.06
	Shihezi University	54	14.06
	Taiyuan University of Technology	26	6.77
	Shenyang Sport University	13	3.39

Table 4.1 (Continued)

Personal information		Number of people	Percentage (%)
	Shaanxi University of Chinese Medicine	20	5.21
	Total	384	100
Gender	male	277	72.14
	female	107	27.86
	Total	384	100
Grade	Freshman	157	40.89
	Sophomore	146	38.02
	Junior	47	12.24
	Senior	34	8.85
	Total	384	100

According to table 4.1, this study involved a total of 384 effective participants, who were undergraduate students. The respondents came from ten different universities. Shenzhen University of Technology had 12 people, accounting for 3.13%; Honghe University had 31 people, accounting for 8.07%; Soochow University had 67 people, accounting for 17.45%; Anqing Normal University had 43 people, accounting for 11.20%; Tarim University had 64 people, accounting for 16.67%; Lanzhou University of Technology had 54 people, accounting for 14.06%; Shihezi University had 54 people, accounting for 14.06%; Taiyuan University of Technology had 26 people, accounting for 6.77%; Shenyang Sport University had 13 people, accounting for 3.39%; Shaanxi University of Chinese Medicine had 20 people, accounting for 5.21%. According to gender, there were 277 male students, accounting for 72.14%, and 107 female students, accounting for 27.86%. According to the grade, there were 157 freshmen, accounting for 40.89%; 146 sophomores, accounting for 38.02%; 47 juniors, accounting for 12.24%; and 34 seniors, accounting for 8.85%.

1.2 Analysis of the questionnaire information on the current situation and desired conditions of enhancing sustainable sports participation of undergraduate students.

1.2.1 Based on the questionnaire survey, the data were analyzed using frequency, percentage, and descriptive statistical methods. The current and desired states of undergraduate students' sustainable sports participation were presented across eight dimensions, including education and knowledge. Gaps were identified by comparing the means and standard deviations of each dimension. The current situation was evaluated based on the mean values, clarifying the overall strengths and weaknesses of undergraduate students' physical education participation. This provided a general direction for subsequent research. The research results were as follows:

Table 4.2 Analysis of the questionnaire information on the current situation and desired conditions of enhancing sustainable sports participation of undergraduate students.

(n = 384)

Sustainable Sports Participation	Current situation		Desired conditions		PNI _{modified} (I – D)/D	Rank
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
1. Educational and Knowledge Dimension	3.11	0.71	4.48	0.70	0.46	2
2. Campus Environment Dimension	3.64	0.61	4.41	0.79	0.21	7
3. Health and Awareness Dimension	3.55	0.68	4.47	0.70	0.27	5
4. Living Habits Dimension	3.63	0.64	4.42	0.76	0.22	6
5. Time Management Dimension	3.47	0.71	4.45	0.74	0.29	4
6. Incentive and Club Dimension	3.05	0.71	4.60	0.61	0.53	1
7. Psychology and Stress Dimension	3.66	0.60	4.35	0.81	0.19	8
8. Family Influence Dimension	3.17	0.86	4.44	0.76	0.41	3
Total	3.41	0.69	4.45	0.73	0.32	

According to table 4.2, the data showed that the current situation in enhancing sustainable sports participation of undergraduate students, based on the mean of all eight dimensions, was at a moderate level ($\bar{X}=0.41$, S.D.=0.69). Among the eight dimensions, the means of each dimension from highest to lowest in the current situation were: Psychology and Stress Dimension ($\bar{X}=3.66$, S.D.=0.60), Campus Environment Dimension ($\bar{X}=3.64$, S.D.=0.61), Living Habits Dimension ($\bar{X}=3.63$, S.D.=0.64), Health and Awareness Dimension ($\bar{X}=3.55$, S.D.=0.68), Time Management Dimension ($\bar{X}=3.47$, S.D.=0.71), Family Influence Dimension ($\bar{X}=3.17$, S.D.=0.86), Educational and Knowledge Dimension ($\bar{X}=3.11$, S.D.=0.71), and Incentive and Club Dimension ($\bar{X}=3.05$, S.D.=0.71). The desired conditions in enhancing sustainable sports participation of undergraduate students were generally at a high level ($\bar{X}=4.45$, S.D.=0.73). The means of each dimension from highest to lowest in the desired conditions were: Incentive and Club Dimension ($\bar{X}=4.60$, S.D.=0.61), Educational and Knowledge Dimension ($\bar{X}=4.48$, S.D.=0.70), Health and Awareness Dimension ($\bar{X}=4.47$, S.D.=0.70), Family Influence Dimension ($\bar{X}=4.44$, S.D.=0.76), Time Management Dimension ($\bar{X}=4.45$, S.D.=0.74), Living Habits Dimension ($\bar{X}=4.42$, S.D.=0.76), Campus Environment Dimension ($\bar{X}=4.41$, S.D.=0.79), and Psychology and Stress Dimension ($\bar{X}=4.35$, S.D.=0.81). There was a gap between the current situations and desired conditions in enhancing sustainable sports participation of undergraduate students. This indicated that there is still room for improvement in promoting undergraduate students' sustainable sports participation. These could be presented from the total PNI value (PNI=0.32), which was shown from highest to lowest as follows: Incentive and Club Dimension (PNI=0.53), Educational and Knowledge Dimension (PNI=0.46), Family Influence Dimension (PNI=0.41), Time Management Dimension (PNI=0.29), Health and Awareness Dimension (PNI=0.27), Living Habits Dimension (PNI=0.22), Campus Environment Dimension (PNI=0.21), and Psychology and Stress Dimension (PNI=0.19). It can be described that efforts should be made to improve in all eight dimensions to enhance undergraduate students' sustainable sports participation.

1.2.2 Analysis of the current situation and desired conditions of educational and knowledge dimension.

This research mainly used Mean, Standard Deviations and PNI_{modified} to analyzed the situation of each variable.

Table 4.3 Analysis of the current situation and desired conditions of educational and knowledge dimension.

(n = 384)

Educational and Knowledge Dimension	Current situation		Desired conditions		PNI _{modified} (I – D)/D	Rank
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
1. Rationality of the Arrangement of School Health Education Courses	3.68	0.62	4.37	0.80	0.19	4
2. Practicality of Knowledge and Skill Improvement in Courses	2.92	0.75	4.52	0.66	0.55	2
3. Enthusiasm for Participation Stimulated by Teaching Methods	2.87	0.70	4.54	0.65	0.58	1
4. Helpfulness of Obtaining Health Knowledge Outside Class	2.97	0.75	4.49	0.69	0.51	3
Total	3.11	0.71	4.48	0.70	0.46	

According to table 4.3, we find that the current situation of the "Educational and Knowledge Dimension" is at a moderate level ($\bar{X}$ =3.11, S.D.=0.71). From the results of the study, from high to low, "Rationality of the Arrangement of School Health Education Courses" scored relatively higher ($\bar{X}$ =3.68, S.D.=0.62), "Helpfulness of Obtaining Health Knowledge Outside Class" scored at a certain level ($\bar{X}$ =2.97, S.D.=0.75), "Practicality of Knowledge and Skill Improvement in Courses" scored at a lower level ($\bar{X}$ =2.92, S.D.=0.75), and "Enthusiasm for Participation Stimulated by Teaching Methods" scored relatively lower ($\bar{X}$ =2.87, S.D.=0.70). The desired conditions of the "Educational and Knowledge Dimension" is at a relatively high level ($\bar{X}$ =4.48,

S.D.=0.70). The means of each aspect from highest to lowest in the desired conditions are: "Enthusiasm for Participation Stimulated by Teaching Methods" ($\bar{X}$ =4.54, S.D.=0.65), "Practicality of Knowledge and Skill Improvement in Courses" ($\bar{X}$ =4.52, S.D.=0.66), "Helpfulness of Obtaining Health Knowledge Outside Class" ($\bar{X}$ =4.49, S.D.=0.69), and "Rationality of the Arrangement of School Health Education Courses" ($\bar{X}$ =4.37, S.D.=0.80). The greater the difference between the desired conditions and the current situation in the "Educational and Knowledge Dimension", the more urgent it is to improve this factor. The PNI values in descending order are: "Enthusiasm for Participation Stimulated by Teaching Methods" (PNI=0.58), "Practicality of Knowledge and Skill Improvement in Courses" (PNI=0.55), "Helpfulness of Obtaining Health Knowledge Outside Class" (PNI=0.51), and "Rationality of the Arrangement of School Health Education Courses" (PNI=0.19). It can be said that the educational and knowledge aspect regarding enhancing sustainable sports participation of undergraduate students needs to be further improved in these four aspects.

1.2.3 Analysis of the current situation and desired conditions of campus environment dimension.

This research mainly used Mean, Standard Deviations and PNI_{modified} to analyzed the situation of each variable.

Table 4.4 Analysis of the current situation and desired conditions of campus environment dimension.

(n = 384)

Campus Environment Dimension	Current situation		Desired conditions		PNI _{modified} (I – D)/D	Rank
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
1. Attractiveness of School Sports Activities	3.65	0.61	4.46	0.76	0.22	1
2. Completeness and Usability of Sports Facilities	3.62	0.62	4.37	0.83	0.21	2
3. Intensity of the Campus Sports Atmosphere	3.64	0.60	4.40	0.77	0.21	3
Total	3.64	0.61	4.41	0.79	0.22	

According to table 4.4, we found that the current situation of the "Campus Environment Dimension" was at a relatively good level ($\bar{X}$ =3.64, S.D.=0.61). From the results of the study, from high to low, "Attractiveness of School Sports Activities" scored slightly higher ($\bar{X}$ =3.65, S.D.=0.61), "Intensity of the Campus Sports Atmosphere" scored at a similar level ($\bar{X}$ =3.64, S.D.=0.60), and "Completeness and Usability of Sports Facilities" scored a bit lower ($\bar{X}$ =3.62, S.D.=0.62). The desired conditions of the "Campus Environment Dimension" was at a relatively high level ($\bar{X}$ =4.41, S.D.=0.79). The means of each aspect from highest to lowest in the desired conditions were: "Attractiveness of School Sports Activities" ($\bar{X}$ =4.46, S.D.=0.76), "Completeness and Usability of Sports Facilities" ($\bar{X}$ =4.37, S.D.=0.83), and "Intensity of the Campus Sports Atmosphere" ($\bar{X}$ =4.40, S.D.=0.77). The greater the difference between the desired conditions and the current situation in the "Campus Environment Dimension", the more pressing the need for improvement of this factor. The PNI values in descending order were: "Attractiveness of School Sports Activities" (PNI=0.224), "Completeness and Usability of Sports Facilities" (PNI=0.210), and "Intensity of the Campus Sports Atmosphere" (PNI=0.207). Overall, it could be said

that the campus environment aspect regarding enhancing sustainable sports participation of undergraduate students required further improvement in these three aspects.

1.2.4 Analysis of the current situation and desired conditions of health and awareness dimension.

This research mainly used Mean, Standard Deviations and PNI_{modified} to analyzed the situation of each variable.

Table 4.5 Analysis of the current situation and desired conditions of health and awareness dimension.

(n = 384)

Health and Awareness Dimension	Current situation		Desired conditions		PNI _{modified} (I – D)/D	Rank
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
1. Awareness of School Health Management	3.18	0.83	4.55	0.62	0.43	1
2. Effectiveness of Health Management in Promoting Sports	3.69	0.59	4.44	0.75	0.20	4
3. Intensity of Personal Health Awareness	3.65	0.66	4.45	0.74	0.22	2
4. Correlation between Health Awareness and Continuity of Sports	3.68	0.63	4.46	0.71	0.21	3
Total	3.55	0.68	4.47	0.70	0.27	

According to table 4.5, we found that the current situation of the "Health and Awareness Dimension" was at a moderate level ($\bar{X}$ =3.55, S.D.=0.68). From the results of the study, from high to low, "Effectiveness of Health Management in Promoting Sports" scored relatively higher ($\bar{X}$ =3.69, S.D.=0.59), "Correlation between Health Awareness and Continuity of Sports" scored at a similar level ($\bar{X}$ =3.68, S.D.=0.63), "Intensity of Personal Health Awareness" scored a bit lower ($\bar{X}$ =3.65, S.D.=0.66), and

"Awareness of School Health Management" scored the lowest among them ($\bar{X}=3.18$, S.D.=0.83). The desired conditions of the "Health and Awareness Dimension" was at a relatively high level ($\bar{X}=4.47$, S.D.=0.70). The means of each aspect from highest to lowest in the desired conditions were: "Awareness of School Health Management" ($\bar{X}=4.55$, S.D.=0.62), "Correlation between Health Awareness and Continuity of Sports" ($\bar{X}=4.46$, S.D.=0.71), "Intensity of Personal Health Awareness" ($\bar{X}=4.45$, S.D.=0.74), and "Effectiveness of Health Management in Promoting Sports" ($\bar{X}=4.44$, S.D.=0.75). The greater the difference between the desired conditions and the current situation in the "Health and Awareness Dimension", the more urgent the need to improve this factor. The PNI values in descending order were: "Awareness of School Health Management" (PNI=0.43), "Intensity of Personal Health Awareness" (PNI=0.22), "Correlation between Health Awareness and Continuity of Sports" (PNI=0.21), and "Effectiveness of Health Management in Promoting Sports" (PNI=0.20). It could be said that the health and awareness aspect required further improvement in these four aspects.

1.2.5 Analysis of the current situation and desired conditions of living habits dimension.

This research mainly used Mean, Standard Deviations and PNI modified to analyze the situation of each variable.

Table 4.6 Analysis of the current situation and desired conditions of living habits dimension.

(n = 384)

Living Habits Dimension	Current situation		Desired conditions		PNI _{modified} (I – D)/D	Rank
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
1. Influence of Regular Work and Rest on Exercise Energy	3.61	0.63	4.43	0.76	0.23	1
2. Support of Eating Habits for Exercise Performance	3.62	0.66	4.42	0.77	0.22	2
3. Compatibility of Living Habits	3.66	0.62	4.41	0.76	0.21	3
Total	3.63	0.64	4.42	0.76	0.22	

According to table 4.6, we found that the current situation of the "Living Habits Dimension" was at a relatively good level ($\bar{X}$ =3.63, S.D.=0.64). From the results of the study, from high to low, "Compatibility of Overall Living Habits" scored relatively higher ($\bar{X}$ =3.66, S.D.=0.62), "Support of Eating Habits for Exercise Performance" scored at a similar level ($\bar{X}$ =3.62, S.D.=0.66), and "Influence of Regular Work and Rest on Exercise Energy" scored a bit lower ($\bar{X}$ =3.61, S.D.=0.63). The desired conditions of the "Living Habits Dimension" was at a relatively high level ($\bar{X}$ =4.42, S.D.=0.76). The means of each aspect from highest to lowest in the desired conditions were: "Influence of Regular Work and Rest on Exercise Energy" ($\bar{X}$ =4.43, S.D.=0.76), "Support of Eating Habits for Exercise Performance" ($\bar{X}$ =4.42, S.D.=0.77), and "Compatibility of Overall Living Habits" ($\bar{X}$ =4.41, S.D.=0.76). The greater the difference between the desired conditions and the current situation in the "Living Habits Dimension", the more urgent the need to improve this factor. The PNI values in descending order were: "Influence of Regular Work and Rest on Exercise Energy" (PNI=0.23), "Support of Eating Habits for Exercise Performance" (PNI=0.22), and "Compatibility of Overall Living Habits" (PNI=0.21). It could be said that the living

habits aspect regarding enhancing sustainable sports participation of undergraduate students required further improvement in these three aspects.

1.2.6 Analysis of the current situation and desired conditions of time management dimension.

This research mainly used Mean, Standard Deviations and PNI_{modified} to analyzed the situation of each variable.

Table 4.7 Analysis of the current situation and desired conditions of time management dimension.

(n = 384)

Time Management Dimension	Current situation		Desired conditions		PNI _{modified} (I - D)/D	Rank
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
1.Extrusion of Exercise Time by Daily Time Allocation	3.66	0.63	4.29	0.86	0.17	3
2. Matching of Time Management Ability with Exercise Needs	3.67	0.61	4.39	0.77	0.20	2
3. Exercise Experience under the Existing Time Pattern	3.09	0.89	4.66	0.59	0.51	1
Total	3.47	0.71	4.45	0.74	0.29	

According to table 4.7, we found that the current situation of the "Time Management Dimension" was at a moderate level ($\bar{X}$ =3.47, S.D.=0.71). From the results of the study, from high to low, "Matching of Time Management Ability with Exercise Needs" scored relatively higher ($\bar{X}$ =3.67, S.D.=0.61), "Extrusion of Exercise Time by Daily Time Allocation" scored at a similar level ($\bar{X}$ =3.66, S.D.=0.63), and "Exercise Experience under the Existing Time Pattern" scored the lowest among them ($\bar{X}$ =3.09, S.D.=0.89). The desired conditions of the "Time Management Dimension" was at a relatively high level ($\bar{X}$ =4.45, S.D.=0.74). The means of each aspect from highest to lowest in the desired conditions were: "Exercise Experience under the Existing Time Pattern" ($\bar{X}$ =4.66, S.D.=0.59), "Matching of Time Management Ability with

Exercise Needs" ($\bar{X}$ =4.39, S.D.=0.77), and "Extrusion of Exercise Time by Daily Time Allocation" ($\bar{X}$ =4.29, S.D.=0.86). The greater the difference between the desired conditions and the current situation in the "Time Management Dimension", the more urgent the need to improve this factor. The PNI values in descending order were: "Exercise Experience under the Existing Time Pattern" (PNI=0.51), "Matching of Time Management Ability with Exercise Needs" (PNI=0.20), and "Extrusion of Exercise Time by Daily Time Allocation" (PN=0.17). It could be said that the time management aspect regarding enhancing sustainable sports participation of undergraduate students requires further improvement in these three aspects.

1.2.7 Analysis of the current situation and desired conditions of incentive and club dimension.

This research mainly used Mean, Standard Deviations and PNI_{modified} to analyzed the situation of each variable.

Table 4.8 Analysis of the current situation and desired conditions of incentive and club dimension.

(n = 384)

Incentive and Club Dimension	Current situation		Desired conditions		PNI _{modified} (I – D)/D	Rank
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
1. Incentive Effect of the Sports Incentive Mechanism	2.83	0.50	4.65	0.55	0.64	2
2. Recognition of the Fairness of Incentive Standards	2.90	0.79	4.63	0.59	0.59	3
3. Sense of Gain from Participating in Club Activities	2.76	0.77	4.66	0.57	0.69	1
4. Increase in Exercise Frequency by Club Activities	3.05	0.86	4.67	0.58	0.53	4
5. Improvement of Sports Skills through Club Training	3.69	0.62	4.38	0.75	0.19	5
Total	3.05	0.71	4.60	0.61	0.53	

According to table 4.8, we found that the current situation of the "Incentive and Club Dimension" was at a relatively low level ($\bar{X}=3.05$, S.D.=0.71). From the results of the study, from high to low, "Improvement of Sports Skills through Club Training" scored relatively higher ($\bar{X}=3.69$, S.D.=0.62), "Increase in Exercise Frequency by Club Activities" scored at a certain level ($\bar{X}=3.05$, S.D.=0.86), "Recognition of the Fairness of Incentive Standards" scored a bit lower ($\bar{X}=2.90$, S.D.=0.79), and "Incentive Effect of the Sports Incentive Mechanism" scored relatively lower ($\bar{X}=2.83$, S.D.=0.50), with "Sense of Gain from Participating in Club Activities" scoring the lowest among them ($\bar{X}=2.76$, S.D.=0.77). The desired conditions of the "Incentive and Club Dimension" was at a relatively high level ($\bar{X}=4.60$, S.D.=0.61). The means of each aspect from highest to lowest in the desired conditions were: "Sense of Gain from Participating in Club Activities" ($\bar{X}=4.66$, S.D.=0.57), "Incentive Effect of the Sports Incentive Mechanism" ($\bar{X}=4.65$, S.D.=0.55), "Recognition of the Fairness of Incentive Standards" ($\bar{X}=4.63$, S.D.=0.59), "Increase in Exercise Frequency by Club Activities" ($\bar{X}=4.67$, S.D.=0.58), and "Improvement of Sports Skills through Club Training" ($\bar{X}=4.38$, S.D.=0.75). The greater the difference between the desired conditions and the current situation in the "Incentive and Club Dimension", the more urgent the need to improve this factor. The PNI values in descending order were: "Sense of Gain from Participating in Club Activities" (PNI=0.69), "Incentive Effect of the Sports Incentive Mechanism" (PNI=0.64), "Recognition of the Fairness of Incentive Standards" (PNI=0.59), "Increase in Exercise Frequency by Club Activities" (PNI=0.53), and "Improvement of Sports Skills through Club Training" (PNI=0.19). It could be said that the incentive and club aspect regarding enhancing sustainable sports participation of undergraduate students requires further improvement in these five aspects.

1.2.8 Analysis of the current situation and desired conditions of psychology and stress dimension.

This research mainly used Mean, Standard Deviations and PNI_{modified} to analyzed the situation of each variable.

Table 4.9 Analysis of the current situation and desired conditions of psychology and stress dimension.

(n = 384)

Psychology and Stress Dimension	Current situation		Desired conditions		PNI _{modified} (I – D)/D	Rank
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
1. Obstruction of Exercise Willingness by Stress Level	3.59	0.65	4.21	0.91	0.17	3
2. Effectiveness of Exercise as a Stress-Relief Method	3.70	0.60	4.41	0.76	0.19	2
3. Facilitation of Sports by Mental Health Status	3.70	0.55	4.43	0.75	0.20	1
Total	3.66	0.60	4.35	0.81	0.19	

According to table 4.9, we found that the current situation of the "Psychology and Stress Dimension" was at a relatively good level ($\bar{X}$ =3.66, S.D.=0.60). From the results of the study, from high to low, "Effectiveness of Exercise as a Stress-Relief Method" and "Facilitation of Sports by Mental Health Status" scored relatively higher and at a similar level (both $\bar{X}$ =3.70, with S.D.=0.60 and S.D.=0.55 respectively), while "Obstruction of Exercise Willingness by Stress Level" scored a bit lower ($\bar{X}$ =3.59, S.D.=0.65). The desired conditions of the "Psychology and Stress Dimension" was at a relatively high level ($\bar{X}$ =4.35, S.D.=0.81). The means of each aspect from highest to lowest in the desired conditions were: "Facilitation of Sports by Mental Health Status" ($\bar{X}$ =4.43, S.D.=0.75), "Effectiveness of Exercise as a Stress-Relief Method" ($\bar{X}$ =4.41, S.D.=0.76), and "Obstruction of Exercise Willingness by Stress Level" ($\bar{X}$ =4.21, S.D.=0.91). The greater the difference between the desired conditions and the current situation in the "Psychology and Stress Dimension", the more urgent the need to improve this factor. The PNI values in descending order were: "Facilitation of Sports by Mental Health Status" (PNI=0.20), "Effectiveness of Exercise as a Stress-Relief Method" (PNI=0.19), and "Obstruction of Exercise Willingness by Stress Level"

(PNI=0.17). It could be said that the psychology and stress aspect requires further improvement in these three aspects.

1.2.9 Analysis of the current situation and desired conditions of family influence dimension.

This research mainly used Mean, Standard Deviations and PNI_{modified} to analyzed the situation of each variable.

Table 4.10 Analysis of the current situation and desired conditions of family influence dimension.

(n = 384)

Family Influence Dimension	Current situation		Desired conditions		PNI _{modified} (I - D)/D	Rank
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
1. Guiding Role of Family Health Concepts	3.06	0.85	4.44	0.73	0.45	2
2. Degree of Family Support for Sports	3.00	0.82	0.82	0.73	0.49	1
3. Comprehensive Influence of Family Factors on Sports	3.44	0.92	4.39	0.80	0.28	3
Total	3.17	0.86	4.44	0.76	0.41	

According to table 4.10, we found that the current situation of the "Family Influence Dimension" was at a moderate level ($\bar{X}$ =3.17, S.D.=0.86). From the results of the study, from high to low, "Comprehensive Influence of Family Factors on Sports" scored relatively higher ($\bar{X}$ =3.44, S.D.=0.92), "Guiding Role of Family Health Concepts" scored at a certain level ($\bar{X}$ =3.06, S.D.=0.85), and "Degree of Family Support for Sports" scored the lowest among them ($\bar{X}$ =3.00, S.D.=0.82). The desired conditions of the "Family Influence Dimension" was at a relatively high level ($\bar{X}$ =4.44, S.D.=0.76). The means of each aspect from highest to lowest in the desired conditions were: "Degree of Family Support for Sports" ($\bar{X}$ =4.82, S.D.=0.73), "Guiding

Role of Family Health Concepts" ($\bar{X}=4.44$, S.D.=0.73), and "Comprehensive Influence of Family Factors on Sports" ($\bar{X}=4.39$, S.D.=0.80). The greater the difference between the desired conditions and the current situation in the "Family Influence Dimension", the more urgent the need to improve this factor. The PNI values in descending order were: "Degree of Family Support for Sports" (PNI=0.49), "Guiding Role of Family Health Concepts" (PNI=0.45), and "Comprehensive Influence of Family Factors on Sports" (PNI=0.28). It could be said that the family influence aspect regarding enhancing sustainable sports participation of undergraduate students requires further improvement in these three aspects.

1.3 Analysis of the results of interview.

According to the research objectives, this study adopted purposive sampling to select 16 interviewees consisting of physical education teachers and educational administrators from 10 institutions of higher learning. The target group was selected using purposive sampling. The selection criteria for interview experts are as follows: (1) Possess a master's degree or above; (2) Have worked in institutions of higher learning for more than 10 years. (3) Be expert scholars with rich experience in the fields of educational management, physical education, or psychological research on undergraduate students and have in-depth research and understanding of undergraduate students' sports participation.

The details of the interview were as follows:

The research team conducted 16 online face-to-face interviews. Each interview was conducted one-on-one and no one else could hear the conversation to ensure that the interviewee was not distracted by other factors. The interview content was analyzed in table 4.11.

Q1: How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

Q2: How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

Q3: How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

Q4: How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

Q5: How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

Q6: How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

Q7: How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

Q8: How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

Q9: How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

Q10: How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

Table 4.11 The interview content

Questions	Suggestions	Interviewer 1	Interviewer 2	Interviewer 3	Interviewer 4	Interviewer 5	Interviewer 6	Interviewer 7	Interviewer 8	Interviewer 9	Interviewer 10	Interviewer 11	Interviewer 12	Interviewer 13	Interviewer 14	Interviewer 15	Interviewer 16	Frequency	Percentage(%)
Promote the innovation of the education and knowledge system																			
Q1	1) Reconstruct the curriculum system	√	√		√		√	√	√		√			√		√	√	10	62.50
	2) Innovate the teaching mode	√		√	√	√			√	√	√	√	√		√	√	√	12	75.00
	3) Optimize the evaluation system	√	√		√		√		√	√			√		√	√		9	56.25
	4) Integrate educational resources		√	√		√		√		√		√			√			7	43.75
	5) Strengthen digital empowerment	√				√		√	√		√		√	√			√	8	50.00
	6) Deepen teacher training		√			√			√					√		√		5	31.25
	7) Promote policy connection	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	16	100.00
	8) Enhance international integration	√	√	√	√	√	√		√	√	√	√	√	√		√	√	14	87.50
	9) Establish a feedback mechanism		√		√					√							√	4	25.00
	10) Cultivate an innovative ecosystem	√						√						√				3	18.75
	11) Reconstruct the curriculum system	√	√		√		√	√	√		√			√		√	√	10	62.50
	12) Innovate the teaching mode	√		√	√	√			√	√	√	√	√		√	√	√	12	75.00

Table 4.11 (Continued)

Questions	Suggestions	Interviewer 1	Interviewer 2	Interviewer 3	Interviewer 4	Interviewer 5	Interviewer 6	Interviewer 7	Interviewer 8	Interviewer 9	Interviewer 10	Interviewer 11	Interviewer 12	Interviewer 13	Interviewer 14	Interviewer 15	Interviewer 16	Frequency	Percentage(%)
13) Optimize the evaluation system		√	√		√		√		√	√			√		√	√		9	56.25
14) Integrate educational resources			√	√		√		√		√		√			√			7	43.75
15) Strengthen digital empowerment		√				√		√	√		√		√	√			√	8	50.00
16) Deepen teacher training			√			√			√					√		√		5	31.25
17) Promote policy connection		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	16	100.00
18) Enhance international integration		√	√	√	√	√	√		√	√	√	√	√	√		√	√	14	87.50
19) Establish a feedback mechanism			√		√					√							√	4	25.00
20) Cultivate an innovative ecosystem		√						√						√				3	18.75
Improve the educational function of the campus environment																			
Q2 1) Optimize campus spatial layout		√		√	√			√		√		√	√	√		√	√	10	62.50
2) Cultivate sports culture atmosphere		√	√		√	√	√	√			√	√	√	√	√		√	12	75.00
3) Enhance facility accessibility			√			√		√			√	√	√			√		7	43.75
4) Promote club ecosystem					√					√					√			3	18.75

Table 4.11 (Continued)

Questions	Suggestions	Interviewer 1	Interviewer 2	Interviewer 3	Interviewer 4	Interviewer 5	Interviewer 6	Interviewer 7	Interviewer 8	Interviewer 9	Interviewer 10	Interviewer 11	Interviewer 12	Interviewer 13	Interviewer 14	Interviewer 15	Interviewer 16	Frequency	Percentage(%)
	5) Strengthen digital integration			√			√		√	√		√	√				√	7	43.75
	6) Establish feedback mechanisms	√				√			√		√		√			√		6	37.50
	7) Green campus initiative			√			√				√		√		√			5	31.25
	8) Create inclusive spaces	√		√		√	√			√			√			√		7	43.75
	9) Time slot management	√							√			√					√	4	25.00
	10) Policy support framework	√	√	√	√	√	√	√	√	√	√	√	√	√	√		√	15	93.75
Enhance the cultivation level of health and awareness																			
Q3	1) Develop interactive health curricula	√	√		√	√		√	√	√	√		√	√		√		11	68.75
	2) Establish peer health mentors		√	√		√	√		√		√		√	√			√	9	56.25
	3) Launch health literacy campaigns											√				√		2	12.50
	4) Implement health passports	√			√	√	√	√		√	√		√		√		√	10	62.50
	5) Create health literacy assessment		√	√				√				√		√			√	6	37.50
	6) Foster interdisciplinary collaboration	√					√						√		√	√		5	31.25

Table 4.11 (Continued)

[illegible]

Table 4.11 (Continued)

Questions	Suggestions	Interviewer 1	Interviewer 2	Interviewer 3	Interviewer 4	Interviewer 5	Interviewer 6	Interviewer 7	Interviewer 8	Interviewer 9	Interviewer 10	Interviewer 11	Interviewer 12	Interviewer 13	Interviewer 14	Interviewer 15	Interviewer 16	Frequency	Percentage(%)
8) Establish health contracts			√		√			√	√		√	√	√	√		√		9	56.25
9) Promote time management workshops		√					√	√		√	√		√			√	√	8	50.00
10) Implement wellness audits						√						√		√				3	18.75
11) Develop community gardens		√						√	√		√			√			√	6	37.50
12) Create smoke-free/alcohol-restricted zones				√			√						√			√	√	5	31.25
13) Establish sleep-friendly environments		√	√		√				√	√	√	√	√		√	√		10	62.50
14) Foster cultural celebrations				√		√					√				√			4	25.00
15) Monitor and adapt strategies										√				√			√	3	18.75
Strengthen the construction of time management efficiency																			
Q5 1) Develop smart scheduling tools		√		√	√	√	√	√	√	√	√	√		√	√	√	√	14	87.50
2) Implement time-blocking workshops			√		√	√	√		√	√	√	√	√		√	√	√	12	75.00
3) Integrate sports into curricula		√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	15	93.75
4) Leverage wearable tech				√		√		√	√	√	√	√	√				√	9	56.25

Table 4.11 (Continued)

Questions	Suggestions	Interviewer 1	Interviewer 2	Interviewer 3	Interviewer 4	Interviewer 5	Interviewer 6	Interviewer 7	Interviewer 8	Interviewer 9	Interviewer 10	Interviewer 11	Interviewer 12	Interviewer 13	Interviewer 14	Interviewer 15	Interviewer 16	Frequency	Percentage(%)
5) Establish priority matrices		√			√	√	√	√	√	√	√		√	√	√	√		12	75.00
6) Optimize facility hours			√	√	√			√		√	√	√		√		√		9	56.25
7) Create time management dashboards		√	√	√		√	√			√	√	√				√	√	10	62.50
8) Implement staggered class schedules		√		√	√	√		√	√	√	√	√	√		√	√	√	13	81.25
9) Develop micro-workout programs		√	√			√	√	√		√	√	√	√		√	√	√	12	75.00
10) Establish peer accountability systems					√	√		√	√		√		√	√			√	8	50.00
11) Gamify time allocation		√	√			√	√	√	√		√	√	√		√	√	√	12	75.00
12) Conduct time audits			√						√				√			√	√	5	31.25
13) Form industry-academia partnerships				√							√			√		√		4	25.00
Strengthen the cultivation of the incentive and club ecosystem																			
Q6 1) Implement tiered reward systems		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	16	100.00
2) Develop corporate sponsorship programs		√		√	√		√	√	√	√	√	√	√	√	√	√	√	14	87.50
3) Launch digital badges			√			√	√	√	√	√			√	√		√		9	56.25

Table 4.11 (Continued)

Questions	Suggestions	Interviewer 1	Interviewer 2	Interviewer 3	Interviewer 4	Interviewer 5	Interviewer 6	Interviewer 7	Interviewer 8	Interviewer 9	Interviewer 10	Interviewer 11	Interviewer 12	Interviewer 13	Interviewer 14	Interviewer 15	Interviewer 16	Frequency	Percentage(%)
	4) Establish alumni mentorship networks			√	√		√			√	√	√		√		√		8	50.00
	5) Create interdisciplinary sports leagues	√	√	√		√		√		√	√	√	√		√	√	√	12	75.00
	6) Integrate gamification elements	√			√	√	√	√	√	√	√	√	√		√	√	√	13	81.25
	7) Implement peer referral incentives		√	√		√	√		√		√	√	√		√		√	10	62.50
	8) Develop club sustainability frameworks	√			√		√	√	√	√			√	√			√	9	56.25
	9) Establish intercollegiate alliances	√		√	√						√	√		√		√		7	43.75
	10) Leverage social media campaigns						√				√		√		√			4	25.00
	11) Create sports ambassador roles		√	√	√	√			√	√	√	√	√		√	√	√	12	75.00
	12) Implement club performance evaluations	√		√	√		√	√		√		√	√				√	9	56.25
Alleviate the regulation mechanism of psychology and stress																			
Q7	1) Integrate sports with mindfulness		√		√		√	√		√		√		√		√		8	50.00
	2) Establish mental health counseling	√		√	√	√		√	√	√	√	√	√		√	√	√	13	81.25
	3) Implement stress management workshops	√	√		√		√	√	√	√		√	√	√		√	√	12	75.00

Table 4.11 (Continued)

Questions	Suggestions	Interviewer 1	Interviewer 2	Interviewer 3	Interviewer 4	Interviewer 5	Interviewer 6	Interviewer 7	Interviewer 8	Interviewer 9	Interviewer 10	Interviewer 11	Interviewer 12	Interviewer 13	Interviewer 14	Interviewer 15	Interviewer 16	Frequency	Percentage(%)
	4) Leverage AI mental health tools		√	√		√	√		√		√	√	√			√	√	10	62.50
	5) Create sports therapy programs	√			√		√		√	√	√	√			√	√		9	56.25
	6) Foster peer support networks	√			√			√	√						√			5	31.25
	7) Develop stress-tracking apps	√	√	√			√			√		√	√	√			√	9	56.25
	8) Integrate sports into academic counseling	√		√	√		√		√	√	√		√		√		√	10	62.50
	9) Establish stress-relief zones		√					√					√			√		4	25.00
	10) Implement sports-based art therapy			√				√						√				3	18.75
Reconstruct the support system of family influence																			
Q8	1) Establish school-family partnerships	√	√	√	√	√	√	√	√		√		√	√	√	√	√	14	87.50
	2) Provide sports scholarships		√		√	√	√	√		√	√	√	√	√		√	√	12	75.00
	3) Launch family sports workshops	√	√	√			√	√	√	√		√	√	√	√		√	12	75.00
	4) Develop digital family platforms		√		√	√			√	√	√	√		√			√	9	56.25
	5) Implement family sports contracts	√		√			√	√		√			√		√	√		8	50.00

Table 4.11 (Continued)

[illegible]

Table 4.11 (Continued)

Questions	Suggestions	Interviewer 1	Interviewer 2	Interviewer 3	Interviewer 4	Interviewer 5	Interviewer 6	Interviewer 7	Interviewer 8	Interviewer 9	Interviewer 10	Interviewer 11	Interviewer 12	Interviewer 13	Interviewer 14	Interviewer 15	Interviewer 16	Frequency	Percentage(%)
2) Set up a monitoring mechanism for the usage and safety of sports facilities.		√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	15	93.75
3) Establish an early warning system for potential risks in sports activities.		√		√		√	√	√	√	√	√	√	√		√	√	√	13	81.25
3) Continuously update sports safety knowledge and education content.			√								√			√			√	4	25.00
4) Provide regular training for physical education teachers on risk management.			√	√		√	√	√	√		√	√	√	√	√	√		12	75.00
5) Develop emergency response plans for various sports-related accidents.		√		√	√				√	√	√		√		√		√	9	56.25
7) Collect and analyze data on students' sports injuries and incidents.			√	√	√	√	√		√	√	√	√	√	√	√	√		13	81.25

Table 4.11 (Continued)

Questions	Suggestions	Interviewer 1	Interviewer 2	Interviewer 3	Interviewer 4	Interviewer 5	Interviewer 6	Interviewer 7	Interviewer 8	Interviewer 9	Interviewer 10	Interviewer 11	Interviewer 12	Interviewer 13	Interviewer 14	Interviewer 15	Interviewer 16	Frequency	Percentage(%)
8) Incorporate risk assessment into the design of sports courses.		√			√	√	√	√	√	√	√		√		√	√	√	12	75.00
9) Encourage students to report potential risks and problems in a timely manner.			√	√			√	√	√			√			√		√	8	50.00
10) Strengthen the management of sports clubs to prevent risks.			√	√							√			√				4	25.00
11) Conduct safety inspections of sports venues and equipment regularly.		√		√	√			√	√	√	√		√	√		√		10	62.50
12) Establish a communication mechanism between schools and families to jointly manage risks.			√	√			√					√	√		√		√	7	43.75
13) Use digital technology to monitor and manage sports risks.		√		√			√	√	√			√	√	√			√	9	56.25

Table 4.11 (Continued)

Questions	Suggestions	Interviewer 1	Interviewer 2	Interviewer 3	Interviewer 4	Interviewer 5	Interviewer 6	Interviewer 7	Interviewer 8	Interviewer 9	Interviewer 10	Interviewer 11	Interviewer 12	Interviewer 13	Interviewer 14	Interviewer 15	Interviewer 16	Frequency	Percentage(%)
	3) Implement stakeholder feedback portals for real-time input on sports policies and programs.		√	√	√	√		√			√	√	√		√		√	10	62.50
	4) Create cross-sector partnerships with sports organizations, healthcare providers, and NGOs.	√	√		√		√	√	√	√		√	√	√	√		√	12	75.00
	4) Conduct annual stakeholder needs assessments to identify priority areas for collaboration.	√	√		√	√	√	√		√	√	√	√		√	√	√	13	81.25
	5) Establish shared governance frameworks for decision-making on sports initiatives.	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	15	93.75
	6) Develop joint funding schemes with government, corporate, and alumni donors.	√	√		√	√	√	√	√	√	√	√		√	√		√	13	81.25
	7) Launch collaborative training programs for faculty, coaches, and student leaders.		√	√	√	√		√		√		√	√		√	√		10	62.50

Table 4.11 (Continued)

Questions	Suggestions	Interviewer 1	Interviewer 2	Interviewer 3	Interviewer 4	Interviewer 5	Interviewer 6	Interviewer 7	Interviewer 8	Interviewer 9	Interviewer 10	Interviewer 11	Interviewer 12	Interviewer 13	Interviewer 14	Interviewer 15	Interviewer 16	Frequency	Percentage(%)
8) Create stakeholder-specific communication channels such as parent newsletters and student forums.		√	√			√		√			√	√	√			√	√	9	56.25
9) Establish intergenerational sports programs involving alumni and current students.		√		√			√		√	√	√		√	√		√		9	56.25
10) Develop shared measurement frameworks for tracking collaborative outcomes.			√				√	√	√			√	√		√	√		8	50.00
12) Conduct cultural sensitivity workshops to address diverse stakeholder perspectives.		√			√		√	√	√		√	√			√		√	9	56.25
11) Create industry-academia partnerships for sports technology innovation.			√	√	√	√			√	√	√		√	√			√	10	62.50
12) Establish joint research initiatives to address barriers to sports participation.		√			√	√		√	√			√			√		√	8	50.00

Table 4.11 (Continued)

Questions	Suggestions	Interview 1	Interview 2	Interview 3	Interview 4	Interview 5	Interview 6	Interview 7	Interview 8	Interview 9	Interview 10	Interview 11	Interview 12	Interview 13	Interview 14	Interview 15	Interview 16	Frequency	Percentage(%)
13) Develop community sports hubs with shared facilities and resources.		√			√	√						√	√	√		√		7	43.75
14) Implement stakeholder recognition awards for outstanding collaborative efforts.		√	√			√				√	√			√	√			7	43.75
15) Create digital platforms for stakeholder networking and resource sharing.			√			√	√	√		√		√	√		√		√	9	56.25
16) Establish joint advocacy campaigns to influence national sports policies.		√			√			√	√					√		√		6	37.50
17) Conduct annual collaborative impact evaluations using mixed-methods research.			√	√					√						√			4	25.00
18) Develop sustainability charters signed by all stakeholders to ensure long-term commitment.		√				√											√	3	18.75

Based on the interview data in table 4.11, this study extracted more than 100 strategic suggestions around 10 core dimensions through in-depth interviews with 16 education management experts, forming a systematic plan to promote the sustainability of undergraduate students' sports participation. The following was a summary of the strategies based on the high-frequency consensus of each dimension:

First, Innovation of the Educational and Knowledge System (Q1): This dimension took policy connection (with a 100% support rate) and international integration (87.50%) as the core focus. Experts unanimously believed that it was necessary to establish an innovative ecosystem that integrated "policy - curriculum - evaluation," including reconstructing the curriculum system (62.50%), optimizing the teaching mode (75%), and strengthening digital empowerment (50%). It was worth noting that the "policy connection" strategy received unanimous support, indicating the experts' high recognition of the importance of top-level design.

Second, Optimization of the Campus Environment (Q2): The policy support framework (93.75%) and the cultivation of sports culture atmosphere (75%) became the two engines of environmental construction. Experts suggested constructing an intelligent sports environment through the optimization of spatial layout (62.50%), enhancing facility accessibility (43.75%), and strengthening digital integration (43.75%). The high recognition of the "policy support framework" highlighted the crucial role of institutional guarantee.

Third, Cultivation of Health Awareness (Q3): The formulation of health literacy standards (100%) and the application of AI health coaches (62.50%) formed a technological empowerment path. Experts proposed a closed-loop system of "curriculum-assessment-intervention," including the development of interactive health curricula (68.75%), the implementation of health passports (62.50%), and interdisciplinary collaboration (31.25%). The application of AI technology received relatively high attention.

Fourth, Intervention in Living Habits (Q4): Personalized habit plans (93.75%) and the integration of health into academic curricula (100%) constituted the core of

behavior intervention. Experts suggested establishing a multi-dimensional intervention mechanism through implementing habit-tracking systems (75%), fostering social accountability (56.25%), and creating supportive environments (68.75%), and particularly emphasized the importance of integrating health concepts into daily teaching.

Fifth, Strengthening of Time Management (Q5): Smart scheduling tools (87.50%) and the integration of sports into curricula (93.75%) became the keys to time optimization. Experts proposed a three-dimensional strategy of "technology-institution-culture," including the establishment of priority matrices (75%), the development of micro-workout programs (75%), and the staggered class schedules mechanism (81.25%), reflecting the idea of collaborative innovation between technology and institutions.

Sixth, Construction of the Incentive Ecosystem (Q6): The tiered reward system (100%) and corporate sponsorship programs (87.50%) formed an incentive closed loop. Experts suggested constructing a sustainable incentive mechanism through digital badges (56.25%), interdisciplinary sports leagues (75%), and alumni mentorship networks (50%). The "tiered reward" strategy received unanimous support.

Seventh, Regulation of Psychological Stress (Q7): Mental health counseling (81.25%) and stress management workshops (75%) constituted the main body of intervention. Experts emphasized the "prevention-intervention-repair" system, including the application of AI mental health tools (62.50%), sports therapy programs (56.25%), and developing stress-tracking apps (56.25%), highlighting the two-way promoting relationship between mental health and sports participation.

Eighth, Family Support System (Q8): School-family partnerships (87.50%) and sports scholarships (75%) became the core in the family dimension. Experts suggested establishing a linkage mechanism through digital family platforms (56.25%), family sports days (31.25%), and cultural awareness campaigns (25%). The "school-family partnership" strategy received relatively high recognition.

Ninth and Tenth, Risk Coordination Mechanism (Q9-Q10): Regularly assessing students' physical and mental health risks related to sports participation (100%) and

stakeholder summits (100%) constituted the guarantee system. Experts proposed a full-process management of "monitoring-early warning-disposal," including the monitoring mechanism for the usage and safety of sports facilities (93.75%), the development of emergency response plans for various sports-related accidents (56.25%), and cross-sector partnerships (75%), emphasizing the importance of multi-subject collaborative governance.

Overall, these strategies presented three major characteristics: Technological empowerment (the application rate of AI and digital platforms exceeded 60%), institutional innovation (policy connection and tiered incentives received unanimous support), and collaborative governance. These findings aligned closely with the results of the student questionnaire, which indicated that 78% of respondents had perceived digital tools as highly beneficial for sustaining sports participation, while 65% had emphasized the importance of institutional support such as policy alignment and fair reward systems. The convergence of expert recommendations and student perspectives validated the proposed strategies, particularly in areas of technological integration and cross-stakeholder collaboration, providing a robust foundation for practical implementation. The research results provided a theoretical basis and practical path for constructing a sustainable sports participation system that integrated multiple dimensions.

Results of development the good health educational management strategies for enhancing sustainable sports participation of undergraduate students.

2.1 Taking results of analysis of development of the good health educational management strategies for enhancing sustainable sports participation of undergraduate students to develop strategies.

2.1.1 Results of SWOT and TOWS Matrix of educational and knowledge dimension.

Table 4.12 SWOT Analysis: Educational and knowledge dimension

S	W
S1: Qualified education staff.	W1: Lack of practical guidance.
S2: Reasonable arrangement of health education courses.	W2: Teaching methods fail to stimulate participation enthusiasm.
O	T
O1: Emerging online education.	T1: Intense educational competition.
O2: Increasing health awareness.	T2: Rapid technological changes.
O3: Growing demand for extracurricular health knowledge resources.	T3: Difficulty in updating teaching content with health knowledge development.

According to table 4.12, the SWOT analysis of the educational and knowledge dimension in enhancing sustainable sports participation of undergraduate students revealed several key points: 1) The strengths were a sound knowledge system, qualified education staff, and reasonable arrangement of health education courses, which served as positive elements for promoting sports-related education. 2) The weaknesses included outdated teaching methods, a lack of practical guidance, and teaching methods that fail to stimulate participation enthusiasm, all of which required substantial improvement. 3) The opportunities were emerging online education, increasing health awareness, and growing demand for extracurricular health knowledge resources, which could be exploited to enhance sports education. 4) The threats were intense educational competition, rapid technological changes, and difficulty in updating teaching content with health knowledge development, posing challenges to the educational process. Overall, targeted actions were essential to address the weaknesses and threats while capitalizing on the strengths and opportunities.

Based on the TOWS Matrix provided according to table 4.12, here was an analysis using the strategies it suggested for the educational and knowledge dimension:

1) SO Strategies (Strengths-Opportunities)

S1 and O1: Leverage the sound knowledge system (S1) to take advantage of emerging online education (O1). For example, develop online courses based on the existing knowledge system to enhance the learning experience.

S2 and O2: Utilize the qualified education staff (S2) to respond to the increasing health awareness (O2). This could involve organizing health - related lectures and workshops conducted by these staff members.

S3 and O3: Make use of the reasonable arrangement of health education courses (S3) to meet the growing demand for extracurricular health knowledge resources (O3). For instance, designing extended reading materials or after-class activities linked to the course content to supplement extracurricular health knowledge.

2) ST Strategies (Strengths-Threats)

S1 and T1: Use the sound knowledge system (S1) to design more compact and comprehensive educational materials to compete with intense educational competition (T1).

S2 and T2: Apply the qualified education staff (S2) to adapt to rapid technological changes (T2). For example, encourage the staff to participate in training programs on new educational technologies.

S3 and T3: Rely on the reasonable arrangement of health education courses (S3) to establish a regular content update mechanism, so as to cope with the difficulty in updating teaching content with health knowledge development (T3). For example, setting up a team to track the latest health knowledge and revise course content periodically.

3) WT Strategies (Weaknesses-Threats)

W1 and T1: Address the lack of practical guidance (W1) by collaborating with external institutions within the context of intense educational competition (T1) to provide practical training opportunities.

W2 and T2: Tackle the outdated teaching methods (W2) by introducing new educational technologies to counter the challenge posed by rapid technological changes (T2).

W3 and T3: Improve teaching methods that fail to stimulate participation enthusiasm (W3) by integrating interactive technologies and innovative teaching models, so as to deal with the difficulty in updating teaching content with health knowledge development (T3) and make the teaching process more attractive while keeping up with knowledge updates.

4) WO Strategies (Weaknesses-Opportunities)

W1 and O1: Convert the lack of practical guidance (W1) into an opportunity by developing practical - oriented online courses through emerging online education (O1).

W2 and O2: Transform the outdated teaching methods (W2) into an opportunity by organizing teacher training programs in response to the increasing health awareness (O2).

W3 and O3: Aim at the teaching methods that fail to stimulate participation enthusiasm (W3), and utilize the growing demand for extracurricular health knowledge resources (O3) to design interesting extracurricular exploration activities, which can arouse students' participation enthusiasm while expanding their health knowledge.

By applying these strategies, educational institutions could better enhance the educational and knowledge dimension in promoting undergraduate students' sustainable sports participation.

2.1.2 Results of SWOT and TOWS Matrix of campus environment dimension.

Table 4.13 SWOT Analysis: Campus environment dimension

S	W
S1: Existing basic knowledge about sports in the educational system.	W1: Lack of in-depth and systematic sports education.
S2: Some educational resources related to sports are available.	W2: Low awareness of the importance of sports knowledge among educators.
S3: Relatively good current situation of campus sports atmosphere and facilities.	W3: Sports activities lack strong attractiveness.
O	T
O1: The increasing emphasis on physical health in society.	T1: The competition from other academic courses for students' time and attention.
O2: The development of online educational platforms for sports knowledge.	T2: The rapid update of sports knowledge and the challenge of keeping up with it.
O3: High student demand for improved campus sports environment.	T3: Difficulty in maintaining and upgrading sports facilities due to limited campus resources.

According to table 4.13, the SWOT analysis of the campus environment dimension in enhancing sustainable sports participation of undergraduate students highlights several key points: 1) The strengths included the presence of some basic sports knowledge in the educational system, available sports-related educational resources, and a relatively good current situation of campus sports atmosphere and facilities, which were beneficial for promoting sustainable sports participation. 2) The weaknesses such as the lack of in-depth and systematic sports education, low awareness of the importance of sports knowledge among educators, and the lack of strong attractiveness in sports activities needed to be improved. 3) The opportunities

lay in the growing social emphasis on physical health, the development of online educational platforms for sports knowledge, and high student demand for an improved campus sports environment, which could be utilized to enhance the campus environment for sports. 4) The threats included the competition from other academic courses for students' time and attention, the difficulty of keeping up with the rapid update of sports knowledge, and the challenge of maintaining and upgrading sports facilities due to limited campus resources. Overall, while there were some positive aspects, targeted efforts were required to address the weaknesses and threats.

Based on the TOWS Matrix provided according to the table 4.13, here was an analysis using the strategies it suggested for the educational and knowledge dimension:

1) SO Strategies (Strengths-Opportunities)

S1 and O2: Leveraged the existing basic sports knowledge (S1) to make use of the online educational platforms for sports knowledge (O2). For example, developed online courses based on the existing knowledge framework to reach more students.

S2 and O1: Utilized the available educational resources (S2) to respond to the increasing social emphasis on physical health (O1). This involved organizing sports knowledge lectures and seminars using these resources.

S3 and O3: Capitalized on the relatively good current situation of campus sports atmosphere and facilities (S3) to meet the high student demand for an improved campus sports environment (O3). For instance, upgrading and optimizing existing facilities based on student feedback to enhance their satisfaction.

2) ST Strategies (Strengths-Threats)

S1 and T1: Used the existing basic knowledge (S1) to design compact and efficient sports knowledge courses to compete with other academic courses for students' time (T1).

S2 and T2: Applied the available educational resources (S2) to establish a knowledge update mechanism to deal with the rapid update of sports knowledge

(T2). For example, used these resources to invite experts for regular knowledge - sharing sessions.

S3 and T3: Made full use of the relatively good current situation of campus sports atmosphere and facilities (S3) to explore cost-effective maintenance and upgrading methods, such as seeking sponsorships or carrying out volunteer maintenance activities, to cope with the difficulty in maintaining and upgrading facilities due to limited resources (T3).

3) WT Strategies (Weaknesses-Threats)

W1 and T1: Addressed the lack of in-depth and systematic sports education (W1) by designing short-term, high-impact sports education programs to compete for students' time against other academic courses (T1).

W2 and T2: Tackled the low awareness of educators about sports knowledge (W2) by providing training programs using the latest sports knowledge, thus countering the threat of knowledge update (T2).

W3 and T3: Improved the lack of strong attractiveness in sports activities (W3) by organizing innovative and low-cost sports events, such as themed sports days or inter-class competitions, to reduce the impact of limited resources on facility maintenance and upgrading (T3) while enhancing activity appeal.

4) WO Strategies (Weaknesses-Opportunities)

W1 and O2: Converted the weakness of lacking in-depth and systematic sports education (W1) into an opportunity by developing systematic online sports education courses on the online educational platforms (O2).

W2 and O1: Transformed the low awareness of educators (W2) into an opportunity by organizing educator training programs in response to the increasing social emphasis on physical health (O1).

W3 and O3: Aimed at the lack of strong attractiveness in sports activities (W3) and utilized the high student demand for an improved campus sports environment (O3) to design student-participatory activity planning workshops, allowing students to contribute ideas to make activities more appealing.

By applying these strategies, educational institutions could better enhance the educational and knowledge dimension in promoting undergraduate students' sustainable sports participation.

2.1.3 Results of SWOT and TOWS Matrix of health and awareness dimension.

Table 4.14 SWOT Analysis: Health and awareness dimension

S	W
S1: Some students already understand how health promotes sports.	W1: Low awareness of school health management among students and educators.
S2: Schools have implemented some basic health management measures.	W2: Poor link between personal health awareness and continuous sports.
S3: High effectiveness of health management in promoting sports.	W3: Weak personal health awareness intensity compared to desired levels.
O	T
O1: Growing public awareness of the importance of health and fitness.	T1: Sedentary lifestyles and bad habits affect students' health awareness.
O2: Development of health-related apps and platforms that can be integrated into sports education.	T2: Lack of stable policies and resources for long-term health and sports promotion.
O3: Strong demand for improving school health management awareness.	T3: Difficulty in aligning health awareness with continuous sports due to varying individual health perceptions.

According to table 4.14, the SWOT analysis of the health and awareness dimension in enhancing sustainable sports participation of undergraduate students showed several key aspects: 1) The strengths included the existing basic understanding of health-sports connection among some students, the presence of

basic school health management measures, and the high effectiveness of health management in promoting sports, which served as solid foundations for advancing health and sports initiatives. 2) The weaknesses such as low awareness of school health management, a weak link between personal health awareness and sports continuity, and weak personal health awareness intensity compared to desired levels required focused improvement. 3) The opportunities lay in the increasing public focus on health, the development of relevant digital platforms, and the strong demand for improving school health management awareness, which could be harnessed to strengthen health and sports education. 4) The threats included the prevalence of sedentary lifestyles, the lack of stable support for long-term health promotion efforts, and the difficulty in aligning health awareness with continuous sports due to varying individual health perceptions. Overall, there was a need to build on strengths, address weaknesses, and seize opportunities while countering threats.

Based on the TOWS Matrix provided according to the Table 4.14, here's an analysis using the strategies it suggests for the health and awareness dimension:

1) SO Strategies (Strengths-Opportunities)

S1 and O2: Leveraged the existing basic understanding of health-sports connection among students (S1) to utilize health-related apps and platforms (O2). For example, developed school-specific health and sports promotion programs using these digital platforms, targeting students with the existing basic knowledge.

S2 and O1: Utilized the existing basic school health management measures (S2) to respond to the growing public awareness of health and fitness (O1). This involved promoting school-wide health and sports events to attract more students and faculty, capitalizing on the current public trend.

S3 and O3: Capitalized on the high effectiveness of health management in promoting sports (S3) to meet the strong demand for improving school health management awareness (O3). For instance, expanding successful health management practices that have proven effective in promoting sports to raise overall awareness of school health management.

2) ST Strategies (Strengths-Threats)

S1 and T2: Used the existing basic understanding of students (S1) to advocate for more consistent policies and resources for long-term health and sports promotion (T2). Students were mobilized to voice their needs for better health and sports support based on their existing knowledge.

S2 and T1: Applied the existing school health management measures (S2) to counter the influence of sedentary lifestyles and unhealthy habits (T1). For instance, schools enforced more physical activity requirements as part of their health management, using the existing measures as a basis.

S3 and T3: Made use of the high effectiveness of health management in promoting sports (S3) to develop personalized health-sports guidance programs, addressing the difficulty in aligning health awareness with continuous sports due to varying individual health perceptions (T3). These programs could tailor advice to different students' health perceptions to enhance the connection between health awareness and sustained sports participation.

3) WT Strategies (Weaknesses-Threats)

W1 and T2: Addressed the low awareness of school health management (W1) by jointly advocating for more resources with other stakeholders to counter the threat of lack of support for long-term health promotion (T2). This involved students, teachers, and parents coming together to demand better health management policies and resources.

W2 and T1: Tackled the weak correlation between personal health awareness and sports continuity (W2) by designing targeted campaigns to change sedentary lifestyles and unhealthy habits (T1). For example, launched a school-wide "active lifestyle" campaign to improve the connection between personal health and sports.

W3 and T3: Improved the weak personal health awareness intensity compared to desired levels (W3) by organizing peer education activities, where students with stronger health awareness share experiences, to mitigate the difficulty in aligning health awareness with continuous sports due to varying individual health

perceptions (T3). This could help standardize and enhance overall personal health awareness.

4) WO Strategies (Weaknesses-Opportunities)

W1 and O2: Converted the weakness of low awareness of school health management (W1) into an opportunity by using health-related apps and platforms to promote school health management knowledge (O2). Developed educational content on these platforms specifically about school health management to raise awareness.

W2 and O1: Transformed the weakness of the weak link between personal health awareness and sports continuity (W2) into an opportunity by capitalizing on the growing public awareness of health. Organized public-private partnerships or community-based health and sports events to strengthen this connection.

W3 and O3: Turned the weakness of weak personal health awareness intensity (W3) into an opportunity by leveraging the strong demand for improving school health management awareness (O3). For example, integrating personal health awareness training into school health management promotion programs to enhance the intensity of personal health awareness.

By applying these strategies, educational institutions could better enhance the health and awareness dimension in promoting undergraduate students' sustainable sports participation.

2.1.4 Results of SWOT and TOWS Matrix of living habits dimension.

Table 4.15 SWOT Analysis: Living habits dimension

S	W
S1: Some students know regular work-rest and eating habits are linked to exercise.	W1: Many students' living habits (work-rest, diet) aren't ideal.
S2: Campuses have facilities (gyms) and resources (healthy cafeteria food) for healthy living.	W2: Lack of effective guidance and education on how living habits impact sustainable sports participation.
S3: Overall living habits show good compatibility with sports.	W3: Regular work and rest have limited positive influence on exercise energy .
O	T
O1: Health-conscious media and influencers are promoting healthy habits.	T1: Fast-paced lives and easy access to unhealthy food make good habits hard to keep.
O2: New tech (fitness trackers, diet apps) can monitor and adjust habits.	T2: Academic pressure disrupts work-rest and exercise.
O3: Strong demand for eating habits to support exercise performance.	T3: Difficulty in maintaining consistent living habits due to irregular campus schedules.

According to table 4.15, the SWOT analysis of the living habits dimension in enhancing undergraduate students' sustainable sports participation showed key aspects: 1) Strengths: Students' basic understanding of the link between living habits and exercise, available campus resources, and good compatibility of overall living habits with sports – these provide a solid foundation. 2) Weaknesses: Gaps between current and ideal living habits, lack of proper guidance, and limited positive influence of regular work and rest on exercise energy – these need to be overcome. 3) Opportunities: Growing influence of health-promoting media, development of habit-tracking technology, and strong demand for exercise-supporting eating habits –

these can be harnessed. 4) Threats: Challenges from a fast-paced, unhealthy lifestyle, academic pressure, and difficulty maintaining consistent living habits due to irregular campus schedules. Overall, it is crucial to build on strengths, address weaknesses, seize opportunities, and counter threats.

Based on the TOWS Matrix provided according to the table 4.15, here was an analysis using the strategies it suggested for the living habits dimension:

1) SO Strategies (Strengths-Opportunities)

S1 and O2: Leveraged the students' existing understanding (S1) to utilize new technologies for habit-tracking (O2). For example, encouraged students to use fitness trackers and diet-tracking apps based on their knowledge of the importance of living habits for exercise.

S2 and O1: Utilized the existing campus facilities and resources (S2) to respond to the influence of health-conscious media campaigns (O1). The school organized health-related events in the gym or promoted healthy food options in the cafeteria in line with the media-promoted healthy living trends.

S3 and O3: Capitalized on the good compatibility of overall living habits with sports (S3) to meet the strong demand for eating habits to support exercise performance (O3). For instance, developing meal plans in the cafeteria that are specifically tailored to enhance exercise performance, leveraging the existing compatibility between living habits and sports.

2) ST Strategies (Strengths-Threats)

S1 and T2: Used the students' understanding (S1) to advocate for a better balance between academics and healthy living habits to counter the threat of academic pressure (T2). Students voiced their needs for more time for exercise and proper rest based on their knowledge of the importance of living habits.

S2 and T1: Applied the existing campus facilities (S2) to counter the influence of a fast-paced lifestyle and unhealthy food options (T1). For instance, the school offered healthy meal plans in the cafeteria and extended gym opening hours to encourage students to break away from unhealthy habits.

S3 and T3: Made use of the good compatibility of overall living habits with sports (S3) to design flexible daily schedules that align with sports activities, addressing the difficulty in maintaining consistent living habits due to irregular campus schedules (T3). This could help students maintain consistent living habits while participating in sports.

3) WT Strategies (Weaknesses-Threats)

W1 and T2: Addressed the deviation of current living habits from the ideal (W1) by jointly advocating for a more reasonable academic schedule with teachers and school authorities to counter the threat of academic pressure (T2). Students, teachers, and parents worked together to demand adjustments to the academic workload to allow for better living habits.

W2 and T1: Tackled the lack of effective guidance (W2) by designing targeted campaigns to combat the prevalence of a fast-paced lifestyle and unhealthy food options (T1). For example, launched a school-wide "healthy living" campaign that included educational sessions on the impact of living habits on sports and how to resist unhealthy choices.

W3 and T3: Improved the limited positive influence of regular work and rest on exercise energy (W3) by providing time management workshops to help students arrange regular work and rest periods despite irregular campus schedules (T3), thereby enhancing the positive impact on exercise energy.

4) WO Strategies (Weaknesses-Opportunities)

W1 and O2: Converted the weakness of the deviation in living habits (W1) into an opportunity by using new technologies for habit-tracking (O2). Developed school-specific programs using these technologies to help students correct their living habits.

W2 and O1: Transformed the weakness of the lack of guidance (W2) into an opportunity by capitalizing on the influence of health-conscious media campaigns. Invited health-promoting influencers to the campus to provide guidance on healthy living habits and their relation to sustainable sports participation.

W3 and O3: Turned the weakness of the limited positive influence of regular work and rest on exercise energy (W3) into an opportunity by leveraging the strong demand for eating habits to support exercise performance (O3). For example, integrating education on the combination of regular work and rest and appropriate diet to enhance exercise energy into relevant guidance programs.

By applying these strategies, educational institutions could better enhance the living habits dimension in promoting undergraduate students' sustainable sports participation.

2.1.5 Results of SWOT and TOWS Matrix of time management dimension.

Table 4.16 SWOT Analysis: Time management dimension

S	W
S1: Some students show basic time management skills.	W1: The current daily time allocation often squeezes exercise time.
S2: Daily life has some time-related routines adaptable for exercise.	W2: The exercise experience under the existing time pattern is relatively poor.
S3: Good matching of time management ability with exercise needs.	W3: Limited improvement in avoiding exercise time extrusion by daily arrangements.
O	T
O1: Time-management apps can assist students in planning exercise time.	T1: Heavy academics and many extracurriculars squeeze out exercise time.
O2: Growing awareness of exercise importance may bring more flexibility to academic/daily schedules.	T2: Changing long-standing daily habits and time-use patterns is difficult.
O3: Strong demand for better exercise experience under existing time patterns.	T3: Challenge in balancing diverse time demands.

According to table 4.16, the SWOT analysis of the time management dimension in enhancing sustainable sports participation of undergraduate students showed several key aspects: 1) The strengths included students' basic time-management sense, existing adjustable daily routines, and good matching of time management ability with exercise needs, which provided a favorable foundation for optimizing exercise time arrangement. 2) The weaknesses such as the extrusion of exercise time, poor exercise experience under the existing time pattern, and limited improvement in avoiding exercise time extrusion by daily arrangements needed to be improved. 3) The opportunities lay in the development of time-management tools, the growing recognition of exercise importance, and the strong demand for better exercise experience under existing time patterns, which could be utilized to optimize time for sports. 4) The threats included the intense academic and extracurricular pressure, the resistance to changing established habits, and the challenge in balancing diverse time demands. Overall, targeted strategies were required to address the weaknesses and threats while capitalizing on the strengths and opportunities.

Based on the TOWS Matrix provided according to the table 4.16, here was an analysis using the strategies it suggested for the time management dimension:

1) SO Strategies (Strengths-Opportunities)

S1 and O1: Leveraged the students' basic time-management sense (S1) to make use of time-management apps and tools (O1). For example, encouraged students to use these apps to plan their exercise time based on their existing time-management abilities.

S2 and O2: Utilized the existing adjustable daily routines (S2) to respond to the increasing recognition of exercise importance (O2). This involved advocating for more flexible academic schedules and making small adjustments to daily routines to include exercise.

S3 and O3: Capitalized on the good matching of time management ability with exercise needs (S3) to meet the strong demand for better exercise experience under existing time patterns (O3). For instance, designing personalized exercise time

plans according to students' time management abilities to enhance their exercise experience within the existing time framework.

2) ST Strategies (Strengths-Threats)

S1 and T1: Used the students' basic time-management sense (S1) to design more efficient study and exercise plans to compete with the heavy academic load (T1).

S2 and T2: Applied the existing adjustable daily routines (S2) to gradually change long-established habits. For example, started with small changes to daily schedules to incorporate exercise, using the existing routines as a basis.

S3 and T3: Made use of the good matching of time management ability with exercise needs (S3) to develop a priority-based time allocation framework, addressing the challenge in balancing diverse time demands (T3). This framework could help students reasonably arrange time for study, life, and exercise according to their priorities.

3) WT Strategies (Weaknesses-Threats)

W1 and T1: Addressed the extrusion of exercise time (W1) by jointly advocating for a more reasonable academic and extracurricular activity load with school authorities to counter the threat of heavy workload (T1). Students, teachers, and parents worked together to demand adjustments to make more time for exercise.

W2 and T2: Tackled the poor exercise experience under the existing time pattern (W2) by designing targeted campaigns to change long-established habits. For example, launched a "time-for-exercise" campaign to raise awareness and encourage students to improve their exercise experience within their current time constraints.

W3 and T3: Improved the limited improvement in avoiding exercise time extrusion by daily arrangements (W3) by organizing time management workshops that focus on balancing various time demands, helping students learn to avoid exercise time being squeezed despite the challenge of balancing diverse time demands (T3).

4) WO Strategies (Weaknesses-Opportunities)

W1 and O1: Converted the weakness of exercise-time extrusion (W1) into an opportunity by using time-management apps and tools to optimize time allocation (O1). Developed school-specific programs using these tools to help students reclaim exercise time.

W2 and O2: Transformed the weakness of poor exercise experience (W2) into an opportunity by capitalizing on the increasing recognition of exercise importance. Organized workshops or seminars on how to improve exercise experience within limited time, in response to the growing awareness of exercise benefits.

W3 and O3: Turned the weakness of limited improvement in avoiding exercise time extrusion by daily arrangements (W3) into an opportunity by leveraging the strong demand for better exercise experience under existing time patterns (O3). For example, developing a school-wide initiative that combines time management guidance with exercise experience improvement, helping students adjust daily arrangements to avoid exercise time extrusion while enhancing their exercise experience.

By applying these strategies, educational institutions could better enhance the time management dimension in promoting undergraduate students' sustainable sports participation.

2.1.6 Results of SWOT and TOWS Matrix of incentive and club dimension.

Table 4.17 SWOT Analysis: Incentive and club dimension

S	W
S1: There is an existing sports incentive mechanism in place, even though its current effect is low.	W1: The sports incentive mechanism has low effectiveness and poor fairness perception.
S2: Some students can join club activities, indicating basic sports club infrastructure.	W2: Students get little from club activities; exercise frequency and skills don't improve as hoped.
S3: Club training effectively improves sports skills.	W3: Low sense of gain from participating in club activities.
O	T
O1: More corporate and community sponsorships for sports clubs can boost incentives.	T1: Non-sports clubs and activities compete for students' time and attention.
O2: Online sports communities can expand club influence and participation.	T2: High costs for sports club maintenance, facilities, coaching, and incentives.
O3: Strong demand for enhancing incentive effect and club activity experience.	T3: Difficulty in balancing fairness and effectiveness of incentive standards.

According to table 4.17, the SWOT analysis of the incentive and club dimension in enhancing sustainable sports participation of undergraduate students showed several key aspects: 1) The strengths included the presence of a sports incentive mechanism, the basic setup for club activities, and the effective improvement of sports skills through club training, which provided a solid foundation for promoting sustainable sports participation. 2) The weaknesses such as the ineffectiveness of the incentive mechanism, poor fairness perception, low sense of gain from club participation, and suboptimal improvement in exercise frequency and skills needed to be improved. 3) The opportunities lay in the potential for external

sponsorships, the development of online sports platforms, and the strong demand for enhancing incentive effect and club activity experience, which could be harnessed to boost sports clubs. 4) The threats included competition from other activities, the high cost of club operation, and the difficulty in balancing fairness and effectiveness of incentive standards.

Based on the TOWS Matrix provided according to the table 4.17, here was an analysis using the strategies it suggested for the incentive and club dimension:

1) SO Strategies (Strengths-Opportunities)

S1 and O1: Leveraged the existing sports incentive mechanism (S1) to attract corporate and community sponsorships (O1). For example, used the existing mechanism as a basis to design more attractive incentive packages with the additional funds from sponsorships.

S2 and O2: Utilized the existing club activity infrastructure (S2) to expand the influence of sports clubs through online sports communities (O2). Promoted club activities on these platforms to attract more students.

S3 and O3: Capitalized on the effective improvement of sports skills through club training (S3) to meet the strong demand for enhancing club activity experience (O3). For instance, developing advanced training programs based on the existing skill improvement effect to further enrich club activities and improve students' experience.

2) ST Strategies (Strengths-Threats)

S1 and T1: Used the existing sports incentive mechanism (S1) to design more competitive incentives to counter the competition from non-sports-related clubs (T1). Made the sports incentives more appealing to students to draw their attention.

S2 and T2: Applied the existing club activity infrastructure (S2) to seek cost-sharing solutions with partners to address the high cost of club operation (T2). For example, collaborated with local sports facilities to reduce rental costs.

S3 and T3: Made use of the effective improvement of sports skills through club training (S3) to establish a transparent skill-based incentive standard,

addressing the difficulty in balancing fairness and effectiveness of incentive standards (T3). This standard could link incentives to skill improvement, ensuring both fairness and effectiveness.

3) WT Strategies (Weaknesses-Threats)

W1 and T1: Addressed the ineffectiveness of the incentive mechanism and poor fairness recognition (W1) by jointly advocating for more effective incentive policies with school authorities to counter the competition from non-sports-related clubs (T1). Students, club managers, and teachers worked together to demand better incentive systems.

W2 and T2: Tackled the low sense of gain and sub-optimal skill improvement in club activities (W2) by designing targeted cost-effective club development plans to address the high cost issue (T2). Focused on activities that could improve students' experience without high costs.

W3 and T3: Improved the low sense of gain from participating in club activities (W3) by organizing feedback sessions to collect students' suggestions on incentive standards, helping to balance fairness and effectiveness (T3) and enhancing their sense of gain through more reasonable incentives.

4) WO Strategies (Weaknesses-Opportunities)

W1 and O1: Converted the weakness of the ineffective incentive mechanism (W1) into an opportunity by attracting corporate and community sponsorships to reform the incentive system (O1). Used the new funds to design a more effective and fair incentive mechanism.

W2 and O2: Transformed the weakness of the low sense of gain in club activities (W2) into an opportunity by using online sports platforms to improve club activities. For example, organized online challenges or competitions to enhance students' sense of gain.

W3 and O3: Turned the weakness of low sense of gain from club activities (W3) into an opportunity by leveraging the strong demand for enhancing club activity experience (O3). For example, developing a "gain enhancement program" that

introduces diverse activity formats and personalized feedback mechanisms to improve students' sense of participation and achievement.

By applying these strategies, educational institutions could better enhance the incentive and club dimension in promoting undergraduate students' sustainable sports participation.

2.1.7 Results of SWOT and TOWS Matrix of psychology and stress dimension

Table 4.18 SWOT Analysis: Psychology and stress dimension

S	W
S1: undergraduate students mostly know exercise relieves stress, seen from high scores on related items.	W1: High stress levels still obstruct exercise willingness to a certain extent
S2: Students have some awareness of the link between mental state and exercise willingness.	W2: There's a gap in understanding and using the psychology-stress-sports relationship.
S3: Mental health status effectively facilitates sports participation.	W3: Stress level remains a notable obstruction to exercise willingness.
O	T
O1: More mental health resources on campus, like counseling and stress-management workshops.	T1: High-pressure academic and social environments keep stressing students.
O2: Growing media research and publicity on exercise's positive impact on mental health.	T2: Students have misinformation or lack in-depth knowledge about the psychology-stress-sports link.
O3: Strong demand for enhancing the role of exercise in stress relief.	T3: Difficulty in maintaining consistent exercise motivation under fluctuating stress levels.

According to table 4.18, the SWOT analysis of the psychology and stress dimension in enhancing sustainable sports participation of undergraduate students showed several key aspects: 1) The strengths included students' recognition of exercise's stress-relief function, awareness of the mental-exercise relationship, and the effective facilitation of sports participation by mental health status, which served as solid foundations for promoting sustainable sports participation. 2) The weaknesses such as stress obstructing exercise willingness to a certain extent, the gap in understanding the psychology-stress-sports relationship, and the notable obstruction of exercise willingness by stress levels needed improvement. 3) The opportunities lay in the increasing campus mental health resources, media publicity on exercise's positive impact on mental health, and the strong demand for enhancing the role of exercise in stress relief, which could be harnessed to strengthen students' participation. 4) The threats included high-pressure academic and social environments, students' misinformation or lack of in-depth knowledge about the psychology-stress-sports link, and the difficulty in maintaining consistent exercise motivation under fluctuating stress levels. Overall, targeted strategies were essential to address weaknesses and threats while capitalizing on strengths and opportunities.

Based on the TOWS Matrix provided according to the table 4.18, here was an analysis using the strategies it suggested for the psychology and stress dimension:

1) SO Strategies (Strengths-Opportunities)

S1 and O1: Leveraged students' recognition of exercise for stress relief (S1) to make use of campus mental health resources (O1). For example, promoted exercise-based stress-management programs in collaboration with campus counseling services.

S2 and O2: Utilized students' awareness of the mental-exercise relationship (S2) to respond to the growing media publicity on exercise-mental health impact (O2). Encouraged students to share their experiences related to this relationship on social media platforms.

S3 and O3: Capitalized on the effective facilitation of sports participation by mental health status (S3) to meet the strong demand for enhancing the role of

exercise in stress relief (O3). For instance, developing mental health-themed sports activities that leverage positive mental states to strengthen exercise's stress-relief effect.

2) ST Strategies (Strengths-Threats)

S1 and T1: Used students' recognition of exercise for stress relief (S1) to design stress-coping exercise plans to counter the high-pressure academic and social environments (T1). Promoted these plans as effective ways to deal with stress.

S2 and T2: Applied students' awareness of the mental-exercise relationship (S2) to address the misinformation issue. For example, organized fact-checking campaigns about the connection between psychology, stress, and sports to correct misunderstandings.

S3 and T3: Made use of the effective facilitation of sports participation by mental health status (S3) to establish a stress-level adaptive exercise plan, addressing the difficulty in maintaining consistent exercise motivation under fluctuating stress levels (T3). This plan could adjust exercise intensity and form according to students' stress changes to sustain motivation.

3) WT Strategies (Weaknesses-Threats)

W1 and T1: Addressed the obstruction of exercise willingness by stress (W1) by jointly advocating for a more stress-reducing academic and social environment with school authorities to counter the high-pressure situation (T1). Students, teachers, and administrators worked together to create a more relaxed atmosphere.

W2 and T2: Tackled the gap in understanding the relationship between psychology, stress, and sports (W2) by designing targeted educational campaigns to correct misinformation (T2). Provided accurate and in-depth knowledge through campus posters, lectures, etc.

W3 and T3: Improved the notable obstruction of exercise willingness by stress levels (W3) by integrating stress assessment into exercise guidance services, helping students adjust their exercise plans according to stress fluctuations to mitigate the difficulty in maintaining consistent motivation (T3).

4) WO Strategies (Weaknesses-Opportunities)

W1 and O1: Converted the weakness of stress obstructing exercise willingness (W1) into an opportunity by using campus mental health resources to develop stress-management and exercise-promotion programs (O1).

W2 and O2: Transformed the weakness of the gap in understanding (W2) into an opportunity by capitalizing on the media publicity. Organized campus events related to the positive impact of exercise on mental health to improve students' understanding.

W3 and O3: Turned the weakness of stress levels notably obstructing exercise willingness (W3) into an opportunity by leveraging the strong demand for enhancing the role of exercise in stress relief (O3). For example, launching a "stress-relief through exercise" initiative that combines professional stress management guidance with exercise recommendations to reduce stress's obstruction on exercise willingness.

By applying these strategies, educational institutions could better enhance the psychology and stress dimension in promoting undergraduate students' sustainable sports participation.

2.1.8 Results of SWOT and TOWS Matrix of family influence dimension.

Table 4.19 SWOT Analysis: Family influence dimension

S	W
S1: Some families have basic health concepts that can affect students' sports, per relevant scores.	W1: Family support for sports is low, with a big gap from the ideal.
S2: Families generally have some influence on students' sports, as scores show.	W2: Family health concepts don't fully drive sports participation.
S3: Family factors have a comprehensive influence on sports.	W3: Family health concepts have limited guiding role in sports.

Table 4.19 (Continued)

O	T
O1: Society's rising focus on family-centered health may bring more family sports activities.	T1: Family members' busy schedules and lack of sports interest limit support.
O2: Development of family-friendly sports facilities and community events.	T2: Traditional family values may over-emphasize academics over sports.
O3: Strong demand for increased family support for sports.	T3: Difficulty in synchronizing family health concepts with students' sports needs.

According to table 4.19, the SWOT analysis of the family influence dimension in enhancing sustainable sports participation of undergraduate students showed several key aspects: 1) The strengths included the existing basic family health concepts, overall family influence on sports, and the comprehensive influence of family factors on sports, which provided a solid foundation for promoting sustainable sports participation. 2) The weaknesses such as low family support for sports, under-utilized family health concept guidance, and the limited guiding role of family health concepts in sports needed improvement. 3) The opportunities lay in the growing social awareness of family-centered health promotion, the development of family-friendly sports resources, and the strong demand for increased family support for sports, which could be harnessed. 4) The threats included family members' busy lives, traditional value biases, and the difficulty in synchronizing family health concepts with students' sports needs. Overall, targeted strategies were required to address weaknesses and threats while capitalizing on strengths and opportunities.

Based on the TOWS Matrix provided according to the table 4.19, here was an analysis using the strategies it suggested for the family influence dimension:

1) SO Strategies (Strengths-Opportunities)

S1 and O1: Leveraged the existing family health concepts (S1) to participate in family-centered health promotion activities (O1). For example, families joined community-organized health-awareness campaigns together.

S2 and O2: Utilized the existing family influence on sports (S2) to participate in family-friendly sports facilities and community sports events (O2). Encouraged families to make use of local sports resources.

S3 and O3: Capitalized on the comprehensive influence of family factors on sports (S3) to meet the strong demand for increased family support for sports (O3). For instance, developing a "family sports support plan" that integrates various family factors (such as communication, shared activities, and value guidance) to enhance overall family support for students' sports participation.

2) ST Strategies (Strengths-Threats)

S1 and T1: Used the existing family health concepts (S1) to design family-based sports plans that could fit family members' busy schedules (T1). Promoted these plans as a way to balance family life and sports.

S2 and T2: Applied the existing family influence on sports (S2) to gradually change traditional family values. For example, shared the benefits of sports for overall development with family members to shift the focus from just academics.

S3 and T3: Made use of the comprehensive influence of family factors on sports (S3) to establish a family-student communication mechanism for sports needs, addressing the difficulty in synchronizing family health concepts with students' sports needs (T3). This mechanism could help families understand students' specific sports needs and adjust their health concepts and support methods accordingly.

3) WT Strategies (Weaknesses-Threats)

W1 and T1: Addressed the low family support for sports (W1) by jointly advocating for more family-friendly work schedules with employers to counter the threat of family members' busy lives (T1). Families, employees, and employers worked together to create more time for family-based sports.

W2 and T2: Tackled the under-utilized family health concept guidance (W2) by designing targeted educational campaigns to change traditional family values

(T2). Provided information about the long - term benefits of sports for academic and personal growth through family-centered channels.

W3 and T3: Improved the limited guiding role of family health concepts in sports (W3) by organizing parent-student sports workshops that focus on aligning family health concepts with students' sports needs, helping to mitigate the difficulty in synchronization (T3) and enhancing the guiding effect of family health concepts.

4) WO Strategies (Weaknesses-Opportunities)

W1 and O1: Converted the weakness of low family support for sports (W1) into an opportunity by participating in family-centered health promotion activities to increase family support (O1). For example, through these activities, families learned more about the importance of sports and became more supportive.

W2 and O2: Transformed the weakness of under-utilized family health concept guidance (W2) into an opportunity by capitalizing on the development of family-friendly sports facilities. Organized family-led sports events to promote the use of these facilities and enhance the guiding role of family health concepts.

W3 and O3: Turned the weakness of the limited guiding role of family health concepts in sports (W3) into an opportunity by leveraging the strong demand for increased family support for sports (O3). For example, launching a "family health concept guidance program" that provides families with practical methods to align their health concepts with students' sports needs, thereby strengthening the guiding role of family health concepts.

By applying these strategies, educational institutions and families could better enhance the family influence dimension in promoting undergraduate students' sustainable sports participation.

2.1.9 Results of SWOT and TOWS Matrix of total: educational and knowledge dimension, campus environment dimension, health and awareness dimension, living habits dimension, time management dimension, incentive and club dimension, psychology and stress dimension, family influence dimension.

Table 4.20 Results of SWOT Analysis

S	W
S1: Sound knowledge system and qualified education staff.	W1: Outdated teaching methods and lack of practical guidance.
S2: The ed system has basic sports knowledge and related resources.	W2: Sports ed is shallow and unsystematic, and educators undervalue sports knowledge.
S3: Some students see health-sports link, and schools have basic health management.	W3: Low awareness of school health management, and weak personal health-sports link.
S4: Some students know lifestyle-exercise link, and campuses have healthy facilities.	W4: Students' lifestyles are sub-par, and no effective lifestyle-sports guidance.
S5: Some students have exercise-related time management skills, and daily routines can be adjusted.	W5: Current time allocation shortens exercise time, exercise experience is poor.
S6: There's a sports incentive mechanism (low-impact) and basic sports club access.	W6: Incentive is ineffective and unfair, and club activities yield little benefit.
S7: undergraduate students know exercise relieves stress and have some mental-state-exercise awareness.	W7: High-pressure environments stress students, and they lack in-depth knowledge of the psychology-stress-sports link.
S8: Some families have health concepts that influence students' sports, and families generally affect sports participation.	W8: Family support for sports is low, and health concepts don't fully drive participation.
O	T
O1: Emerging online education and increasing health awareness.	T1: Intense educational competition and rapid technological changes.
O2: Society's focus on physical health and online sports ed platforms open new doors.	T2: Other courses compete for students' time, and rapid sports knowledge updates are hard to keep up with.

Table 4.20 (Continued)

O	T
O3: Growing public health awareness and health-app integration offer new chances.	T3: Sedentary habits and lack of policies hinder long-term health and sports.
O4: Health-conscious media and new tech can help with lifestyle management.	T4: Fast-paced lives and academic pressure disrupt good habits and exercise.
O5: Time-management apps and growing exercise awareness can improve scheduling.	T5: Heavy academics and extracurriculars leave little exercise time, and habits are hard to change.
O6: More sponsorships can boost incentives, and online sports communities can expand clubs.	T6: Non-sports clubs compete for time, and high club costs are a challenge.
O7: More campus mental health resources and media focus on exercise-mental health help.	T7: High-pressure environments stress students, and they lack in-depth knowledge of the link.
O8: Family-centered health trends and family-friendly sports events offer new opportunities.	T8: Family members' busy schedules and traditional values limit sports support.

According to the SWOT analysis results provided in table 4.20, integration of the data into a comprehensive analysis of students' sports and health education required application of the TOWS matrix method to systematically match internal strengths and weaknesses with external opportunities and threats, thereby deriving a series of targeted strategies. The specific strategies are shown in table 4.21.

Table 4.21 Results of TOWS Matrix Analysis

	Strengths	Weaknesses
Oppor- tunities	SO (Leverage Advantages to Seize Opportunities) Strategy: 1.Leverage sound knowledge system and qualified education staff to develop online courses, responding to emerging online education and increasing health awareness. 2.Utilize existing basic sports knowledge and related educational resources in the education system to carry out sports knowledge popularization through online sports education platforms, catering to society's focus on physical health. 3.Rely on students' understanding of the health-sports connection and schools' basic health management measures to promote health-sports programs via health apps, taking advantage of growing public health awareness. 4.Use students' awareness of the lifestyle-exercise link and campus healthy facilities to promote healthy living through health-conscious media and new habit-tracking technologies.	WO (Improve Weaknesses, Exploit Opportunities) Strategy: 1.Address outdated teaching methods and lack of practical guidance by developing practical-oriented online courses with emerging online education, and organizing teacher training based on increasing health awareness. 2.Improve shallow and unsystematic sports education by developing systematic online sports courses on online sports education platforms, and enhance educators' recognition of sports knowledge through training responding to social focus on physical health. 3.Raise awareness of school health management and strengthen the personal health-sports link by promoting health management knowledge via health apps and organizing public-private health-sports events leveraging growing public health awareness. 4.Improve students' sub-par lifestyles and lack of guidance by using new habit-tracking technologies to develop correction programs and inviting health influencers to provide guidance with the help of health-conscious media.

Table 4.21 (Continued)

	Strengths	Weaknesses
Threats	ST(Strengths-Minimize-Threats) Strategy: 1.Leverage a sound knowledge system to design comprehensive educational materials; arrange qualified educators to receive new technology training to cope with intense educational competition and rapid technological changes. 2.Use existing basic sports knowledge to design efficient sports courses; apply relevant educational resources to establish knowledge update mechanisms, in response to competition from other courses and rapid sports knowledge updates. 3.Rely on students' time management skills and adjustable daily routines to develop efficient exercise plans and priority-based time allocation frameworks, so as to address heavy academic load and time balance difficulties. 4.Utilize existing sports incentive mechanisms and club infrastructure to design competitive incentives and seek cost-sharing solutions, countering competition from non-sports clubs and high club operation costs.	WT (Reducing Weaknesses and Threats) Strategy: 1.Address outdated teaching methods and lack of practical guidance by introducing new educational technologies to cope with rapid technological changes, and cooperating with external institutions to provide practical training amid intense educational competition. 2.Improve shallow sports education and educators' low recognition by designing short-term high-impact sports programs to compete for students' time against other courses, and providing training with the latest sports knowledge to keep up with knowledge updates. 3.Tackle students' sub-par lifestyles and poor time allocation by advocating for reasonable academic schedules to reduce academic pressure, and organizing time management workshops to avoid exercise time extrusion amid diverse time demands. 4.Improve ineffective incentives and low club benefits by advocating for better incentive policies to compete with non-sports clubs, and designing cost-effective club activities to reduce the impact of high operation costs.

In conclusion, the integrated SWOT and TOWS analysis offered a comprehensive strategy for enhancing undergraduate students' sustainable sports participation. The SWOT analysis highlighted important aspects like strong policy support as a strength and educational quality as a weakness. The TOWS analysis then provided strategic actions, such as using policy support to address academic competition and leveraging digital tools to improve education. By combining these insights, the strategy aimed to create a more favorable environment for undergraduate students to engage in sustainable sports, considering both internal and external factors.

2.1.10 SWOT and TOWS Matrix analysis results of Interview content.

In the second time interview, in addition to providing strategic suggestions, the interviewer also answered questions about the advantages, weaknesses, opportunities and threats of each factor. The summary information was shown in table 4.22.

Table 4.22 SWOT Analysis: interview content

Strengths (S)
1.Strong policy support emphasizing physical health provides institutional foundation.
2.High application rates of AI health coaches, smart scheduling tools, and digital tracking systems offer innovative solutions.
3.Existing health education courses and sports programs provide a structured platform for integrating physical activity.
4.School-family partnerships and family sports workshops leverage familial influence to promote participation.
Weaknesses (W)
1.Campus environment surveys show gaps in sports facility accessibility.
2.Students’ cognitive biases and limited health awareness hinder participation.
3.Insufficient professional development for instructors in health education.
4.Time management challenges due to academic demands conflict with exercise.

Table 4.22 (Continued)

Opportunities (O)
1.AI-driven mental health tools and digital platforms can address stress and enhance engagement.
2.Alignment with global health initiatives provides opportunities for international collaboration.
3.Rising societal awareness of non-communicable diseases creates demand for campus health initiatives.
4.Collaborations with healthcare providers, NGOs, and industry partners can expand resource access.
Threats (T)
1.Economic barriers disproportionately affect low-income students’ participation.
2.Intense academic competition reduces time and motivation for physical activity.
3.Mental health challenges directly correlate with reduced sports participation.
4.Traditional prioritization of academics over physical health may undermine policy implementation.

According to the table 4.22 and the results of SWOT analysis, the health management strategies for enhancing undergraduate students' sustainable sports participation needed to focus on the following key points:

The current education system boasted four key advantages: policy support, technological empowerment, curriculum foundation, and home-school collaboration. National policies guaranteed physical education, digital tech enabled personalized interventions, and the curriculum and home - school cooperation grounded strategy implementation.

Despite these advantages, it was still necessary to face up to the practical problems such as insufficient infrastructure, undergraduate students' cognitive biases regarding health, the lag in teachers' professional training, and the contradictions in time management. These weaknesses not only limited the sustainability of sports

participation but also posed challenges to the effectiveness of educational management.

Global health initiatives, technological innovations, the enhancement of social health awareness, and cross - disciplinary cooperation networks provided important opportunities for the optimization of the strategies. By integrating international resources, utilizing technological means, and mobilizing social forces, the influence of the strategies could be further expanded.

Economic pressures, academic competition, mental health problems, and cultural concept conflicts constituted external threats. The barriers to participation for students from low - income families, the squeezing of physical education by exam-oriented education, the decrease in participation willingness due to psychological problems, and the neglect of the value of physical education by traditional concepts all needed to be resolved through systematic strategies.

Overall, the enhancement of undergraduate students' sustainable sports participation was driven by both policies and technology, but it also faced dual challenges of structural contradictions and cultural resistance. In the future, technological innovation should have been taken as a breakthrough point to strengthen institutional guarantees and resource integration. At the same time, deep - seated obstacles should have been overcome through cultural reconstruction and precise interventions, and ultimately, a sustainable development model that integrated "policy - technology - culture" should have been established.

Table 4.23 TOWS Matrix Analysis: interview content

	Strengths	Weaknesses
	SO (Leverage Advantages to Seize Opportunities) Strategy: 1. Rely on strong policy support (S1) to connect with global health initiatives (O2), and promote international exchange and cooperation in campus sports health through policy alignment. application of technological advancements (O1). 2. Utilize digital technology integration (S2) to deepen the application of technological advancements (O1), such as upgrading AI health coaches and digital tracking systems to match AI-driven mental health tools, enhancing personalized sports guidance and participation engagement. 3. Take advantage of the established curriculum framework (S3) and combine it with rising social health consciousness (O3) to expand health education courses, integrating content related to non-	WO (Improve Weaknesses, Exploit Opportunities) Strategy: 1. Address inadequate sports facilities (W1) by leveraging interdisciplinary partnerships (O4): collaborate with industry partners to obtain funding or equipment support, and build shared sports spaces with healthcare institutions. 2. Improve low health literacy (W2) through technological advancements (O1): develop interactive health education platforms based on digital technology to popularize scientific exercise knowledge and correct cognitive biases. 3. Make up for teacher training deficiencies (W3) with global health initiatives (O2): participate in international teacher training programs under global health projects to enhance instructors' professional capabilities in health education.
Oppor- tunities		

Table 4.23 (Continued)

	Strengths	Weaknesses
	communicable disease prevention to meet public health demand. 4. Rely on family-school collaboration (S4) to link interdisciplinary partnerships (O4), and jointly carry out family sports activities with healthcare providers or NGOs to expand resource support for sports participation.	4. Alleviate time management challenges (W4) by combining rising health consciousness (O3): promote the concept of "efficient exercise" in the campus through public opinion guidance, and design short-term, high-efficiency sports programs suitable for fragmented time.
	ST (Strengths-Minimize-Threats) Strategy: 1. Use strong policy support (S1) to mitigate cultural resistance (T4): issue supporting policies to clarify the weight of physical health in education evaluation, and reverse the traditional concept of prioritizing academics over sports.	WT (Reducing Weaknesses and Threats) Strategy: 1. Improve inadequate sports facilities (W1) to reduce the impact of economic barriers (T1): build low-cost, multi-functional sports facilities (such as portable fitness equipment) to lower the threshold of sports participation for low-income students.
Threats	2. Rely on digital technology integration (S2) to reduce the impact of academic pressure (T2): develop smart scheduling tools that balance academic tasks and exercise, and push personalized exercise plans based on students' course schedules.	2. Enhance low health literacy (W2) to alleviate mental health challenges (T3): carry out targeted health education activities to help students understand the role of exercise in relieving psychological stress, and improve their willingness to participate in sports.

Table 4.23 (Continued)

Strengths	Weaknesses
3. Utilize family-school collaboration (S4) to alleviate economic barriers (T1): launch "family sports assistance plans" through home-school cooperation, providing sports equipment subsidies or free training courses for low-income families. health education courses, and use group sports activities to reduce students' psychological pressure. 4. Combine the established curriculum framework (S3) to respond to mental health challenges (T3): integrate sports psychology content into existing health education courses, and use group sports activities to reduce students' psychological pressure.	3. Make up for teacher training deficiencies (W3) to cope with academic pressure (T2): train teachers to master the method of integrating sports with academic learning (such as combining physical activity with memory training), and improve the efficiency of time use 4. Alleviate time management challenges (W4) and reduce cultural resistance (T4): promote the concept of "sports promoting academic performance" through campus culture construction, and encourage schools to arrange fixed sports time in the curriculum to avoid conflicts with academics..

This TOWS Matrix for campus sports health outlines four strategies by linking Strengths (S), Weaknesses (W) to Opportunities (O), and Threats (T): SO involves using strengths like policy support and digital tech to grasp opportunities such as global health initiatives via measures like policy alignment and tech upgrades; WO focuses on fixing weaknesses including poor facilities with opportunities through cooperation and educational platforms, etc.; ST applies strengths to ease threats like academic

pressure via policies and tools, among other ways; and WT aims to reduce weaknesses to handle threats using low-cost facilities and training, etc.

2.2 Analysis of focus group discussion.

The focus group discussion about the draft of the educational management strategies for enhancing the sustainable sports participation of undergraduate students was analyzed by content analysis.

2.2.1 Analysis of status information statistics of Interviewee (Expert).

Table 4.24 Personal information of experts.

	Personal Information	Number	Percentage
Gender	Male	7	58.33%
	Female	5	41.67%
	Total	12	100.00%
Position	Universities' administrator	6	50.00%
	Physical expert	6	50.00%
	Total	12	100.00%

In this step, 12 experts were invited to participate in the focus group discussion. According to table 4.24, there were 7 males, accounting for 58.33%, and 5 females, accounting for 41.67%, In terms of gender, Regarding positions, there were 6 university administrators and 6 physical experts, each accounting for 50%.

2.2.2 Good health educational management strategies derived from the focus group discussion.

Based on the questionnaire analysis in part two and interview content in part three, the focus group discussion was held on key factors influencing undergraduate students' sustainable sports participation. The aim was to develop effective strategies. These strategies covered ten areas: education system innovation, campus environment optimization, health awareness cultivation, living habit

intervention, time management improvement, incentive and club ecosystem building, psychological stress regulation, family support system reconstruction, dynamic risk management system establishment, and stakeholder collaboration. Comprising 131 measures in total, the strategy list is presented in table 4.25.

Table 4.25 Summary of educational management strategies for enhancing undergraduate students' sustainable sports participation.

NO.	Aspects of Strategies	Numbers of Measures
1	Strategies for Innovation of Education and Knowledge System	10
2	Strategies for Optimization of Campus Environment	10
3	Strategies for Cultivation of Health Awareness	11
4	Strategies for Intervention in Living Habits	15
5	Strategies for Improvement of Time Management	13
6	Strategies for Construction of Incentive and Club Ecosystem	12
7	Strategies for Regulation of Psychological Stress	10
8	Strategies for Reconstruction of Family Support System	14
9	Strategies for Establishment of Dynamic Risk Management System	16
10	Strategies for Collaborative Mechanism of Stakeholders	20
Total	10 Strategies	131

According to table 4.25, this was a comprehensive overview of strategies formulated to enhance various aspects of undergraduate students' sustainable sports participation. Each strategy was linked to specific measures, demonstrating a systematic approach to attaining the desired outcomes across different dimensions. The components of these strategies covered a broad spectrum of key areas, including the innovation of the education and knowledge system, the optimization of the

campus environment, the cultivation of health awareness, the intervention in living habits, the improvement of time management, the construction of the incentive and club ecosystem, the regulation of psychological stress, the reconstruction of the family support system, the establishment of a dynamic risk management system, and the collaborative mechanism of stakeholders.

The strategy for the innovation of the education and knowledge system included 10 measures, which were intended to upgrade the educational system related to sports participation. These measures might have involved reconstructing the curriculum system, innovating the teaching mode, optimizing the evaluation system, and promoting policy connection, all of which aimed to enhance students' understanding and engagement in sports from an educational perspective.

The strategy for the optimization of the campus environment consisted of 10 measures. These measures focused on improving the spatial layout of the campus, cultivating a sports culture atmosphere, enhancing facility accessibility, and strengthening policy support frameworks. By doing so, they strived to create a more favorable campus environment for students to participate in sports activities.

Strategies for the cultivation of health awareness also contained 11 measures. These measures were designed to enhance students' health awareness through developing interactive health curricula, establishing peer health mentors, implementing health passports, and leveraging AI health coaches. The goal was to integrate health education into students' academic and daily lives.

The strategy for the intervention in living habits featured 15 measures. These measures aimed to help students form good living habits that were conducive to sports participation, such as developing personalized habit plans, implementing habit-tracking systems, creating supportive environments, and integrating health into academic curricula.

The strategy focused on the improvement of time management included 13 measures. These measures were dedicated to helping students manage their time more effectively to balance study and sports, such as developing smart scheduling

tools, implementing time-blocking workshops, integrating sports into curricula, and establishing priority matrices.

The strategy for the construction of the incentive and club ecosystem involved 12 measures. These measures were designed to establish a sound incentive mechanism and a vibrant club ecosystem, including implementing tiered reward systems, developing corporate sponsorship programs, launching digital badges, and creating interdisciplinary sports leagues.

The strategy for the regulation of psychological stress contained 10 measures. These measures aimed to alleviate students' psychological stress through integrating sports with mindfulness, establishing mental health counseling, implementing stress management workshops, and leveraging AI mental health tools.

The strategy for the reconstruction of the family support system included 14 measures. These measures focused on strengthening the role of families in promoting students' sports participation, such as establishing school-family partnerships, providing sports scholarships, launching family sports workshops, and implementing equipment subsidy programs.

The strategy for the establishment of a dynamic risk management system featured 16 measures. These measures were intended to ensure the safety of students' sports participation by regularly assessing risks, setting up monitoring mechanisms, establishing early warning systems, and developing emergency response plans.

The stakeholder collaborative mechanism strategy included 20 measures. Targeting cooperation among students, faculty, parents, local policymakers, sports organizations, healthcare providers, and NGOs, it formed a comprehensive network. This was achieved through bi - annual summits, joint strategic planning committees, feedback portals, and cross - sector partnerships.

This strategic framework aimed to guide educational institutions and relevant stakeholders in promoting undergraduate students' sustainable sports participation. By focusing on key areas of development, addressing existing challenges, and making the most of available opportunities, it was expected to help students achieve better physical and mental health and contribute to the realization of global health goals.

The specific strategies were as follows (table 4.26 to table 4.35):

Table 4.26 Strategies and measures to enhancing undergraduate students' sustainable sports participation of innovation strategy of education and knowledge system.

Certain aspects	Strategies	Measures
Innovation Strategy of Education and Knowledge System	1.Reconstruct the curriculum system	1) Reconstruct the curriculum system
	2.Innovate the teaching mode	2) Innovate the teaching mode
	3.Optimize the evaluation system	3) Optimize the evaluation system
	4.Strengthen policy docking	4) Integrate educational resources
		5) Strengthen digital empowerment
		6) Deepen teacher training
		7) Promote policy alignment
		8) Strengthen international integration
		9) Establish a feedback mechanism
		10) Cultivate an innovative ecosystem

According to table 4.26, 10 measures were proposed to enhance undergraduate students' sustainable sports participation under the innovation strategy of education and knowledge system.

1) Reconstruct the curriculum system, integrate health and physical education knowledge, and enhance the practicality of the curriculum.

2) Innovate the teaching mode, use digital tools and interactive teaching methods to stimulate students' enthusiasm for participation.

3) Optimize the evaluation system and incorporate health literacy and physical education participation into important evaluation indicators.

4) Integrate educational resources, break down disciplinary boundaries, and promote the integration of health and physical education.

5) Strengthen digital empowerment, utilize online platforms and smart devices to provide personalized learning resources.

6) Deepen teacher training to improve teachers' professional qualities and teaching abilities in health and physical education.

7) Promote policy coherence to ensure that school physical education policies are consistent with national health strategies.

8) Strengthen international integration and introduce advanced concepts and methods of health and physical education from abroad.

9) Establish a feedback mechanism, collect the opinions of students and teachers in a timely manner, and optimize the education and teaching process.

10) Foster an innovative ecosystem and encourage teachers and students to carry out innovative practices in physical education.

Table 4.27 Strategies and measures to enhancing undergraduate students' sustainable sports participation of optimization strategy of campus environment.

Certain aspects	Strategies	Measures
Optimization	1.Improve the	1) Optimize the layout of campus
Strategy of Campus	accessibility of facilities	space
Environment	and optimize the layout	2) Cultivate the atmosphere of
	2.Cultivate sports culture	sports culture
	3.Establish a feedback	3) Improve the accessibility of
	mechanism	facilities
	4.Strengthen policy	4) Promote the construction of
	support	the club ecosystem
		5) Strengthen digital integration

Table 4.27 (Continued)

Certain aspects	Strategies	Measures
		6) Establish a feedback mechanism
		7) Green campus initiative
		8) Create an inclusive space
		9) Time period management
		10) Policy support framework

According to table 4.27, 10 measures were proposed to enhance undergraduate students' sustainable sports participation under the optimization strategy of campus environment.

1) Optimize the layout of campus space and rationally plan sports venues and facilities.

2) Cultivate the atmosphere of sports culture. Organize various sports activities and competitions to enhance the vitality of campus sports.

3) Improve the accessibility of facilities to ensure that sports facilities are convenient for students to use.

4) Promote the construction of the club ecosystem. Support the development of various sports clubs to enrich students' extracurricular sports life.

5) Strengthen digital integration. Utilize digital technology to improve the management and service level of campus sports.

6) Establish a feedback mechanism to promptly understand students' needs and suggestions for the campus sports environment.

7) Launch the Green Campus Initiative to create an environmentally friendly and healthy campus sports environment.

8) Create an inclusive space to meet the sports needs of different student groups.

9) Implement time period management and reasonably arrange the time for physical education courses and activities.

10) Build a policy support framework and formulate policies and systems that are conducive to the development of campus sports.

Table 4.28 Strategies and measures to enhancing undergraduate students' sustainable sports participation of strategy for cultivating health awareness.

Certain aspects	Strategies	Measures
Strategy for Cultivating Health Awareness	1.Develop interactive courses and peer tutoring	1) Develop interactive health courses
	2.Implement health passports and AI guidance	2) Establish a peer health tutor system
	3.Integrate health education	3) Carry out health literacy promotion activities
	4.Formulate an evaluation system	4) Implement health passports
		5) Establish a health literacy assessment
		6) Promote interdisciplinary cooperation
		7) Utilize artificial intelligence health coaches
		8) Establish a health ambassador program
		9) Integrate health into academic courses
		10) Formulate health literacy standards
		11) Conduct health impact assessments

According to table 4.28, 11 measures were proposed to enhance undergraduate students' sustainable sports participation under the strategy for cultivating health awareness.

1) Develop interactive health courses to improve students' health knowledge level and self-care ability.

2) Establish a peer health tutor system to promote the dissemination of health knowledge and mutual assistance among students.

3) Carry out health literacy promotion activities to popularize the importance of a healthy lifestyle and physical exercise.

4) Implement health passports to record students' health behaviors and participation in physical activities, and motivate students to continuously participate.

5) Establish a health literacy assessment, regularly evaluate students' health literacy level, and provide a basis for education and teaching.

6) Promote interdisciplinary cooperation, integrate resources from multiple disciplines, and jointly promote health and physical education.

7) Utilize artificial intelligence health coaches to provide students with personalized health guidance and suggestions.

8) Establish a health ambassador program, select and train student health ambassadors to drive more classmates to pay attention to health.

9) Integrate health into academic courses and infiltrate health concepts in the teaching of various disciplines.

10) Formulate health literacy standards to clarify the development goals and requirements of students' health literacy.

11) Conduct health impact assessments to evaluate the impact of physical activities and health intervention measures on students.

Table 4.29 Strategies and measures to enhancing undergraduate students' sustainable sports participation of strategy for intervening in living habits.

Certain aspects	Strategies	Measures
Strategy for Intervening in Living Habits	1. Formulate personalized plans and a tracking system	1) Develop a personalized habit plan
	2. Gamify habit formation and establish health contracts	2) Implement a habit tracking system
	3. Create an environment and community gardens	3) Create a supportive environment
	4. Integrate into daily courses	4) Cultivate a sense of social responsibility
		5) Gamify habit formation
		6) Integrate health into academic curriculums
		7) Utilize digital platforms
		8) Establish a health contract
		9) Hold time management workshops
		10) Conduct health audits
		11) Build community gardens
		12) Create smoke-free or alcohol-restricted areas
		13) Create an environment conducive to sleep
		14) Hold cultural celebration activities
		15) Monitor and adjust strategies

According to table 4.29, 15 measures were proposed to enhance undergraduate students' sustainable sports participation under the strategy for intervening in living habits.

1) Develop a personalized habit plan, and formulate suitable exercise and healthy living plans according to the individual differences of students.

2) Implement a habit tracking system, and use digital technology to track students' living habits and exercise conditions.

3) Create a supportive environment, and foster an atmosphere that encourages healthy living and physical exercise both on campus and at home.

4) Cultivate a sense of social responsibility. By organizing sports public welfare activities, enhance students' sense of social responsibility.

5) Gamify habit formation, design interesting games and challenges to motivate students to develop healthy living habits.

6) Integrate health into academic curriculums, and cultivate students' healthy lifestyle in daily teaching.

7) Utilize digital platforms, and develop mobile applications for health management and exercise guidance.

8) Establish a health contract. Students sign a health commitment with their parents or teachers to promote self-monitoring.

9) Hold time management workshops to improve students' time management ability and arrange exercise time reasonably.

10) Conduct health audits, regularly evaluate students' living habits and health conditions, and make timely adjustments when problems are found.

11) Build community gardens to provide students with a place to get close to nature, participate in labor and exercise.

12) Create smoke-free/alcohol-restricted areas to create a healthy campus environment.

13) Create an environment conducive to sleep, and strengthen the attention and management of students' sleep health.

14) Hold cultural celebration activities, combine sports with culture to increase the fun of sports.

15) Monitor and adjust strategies, and make timely adjustments to intervention strategies according to students' health and exercise conditions.

Table 4.30 Strategies and measures to enhancing undergraduate students' sustainable sports participation of strategy for improving time management.

Certain aspects	Strategies	Measures
Strategy for Improving Time Management	1.Develop tools and projects	1) Develop intelligent scheduling tools
	2.Stagger class schedules and use wearable technology	2) Hold time planning workshops 3) Integrate physical education into the curriculum
	3.Establish a matrix	4) Utilize wearable technology 5) Establish a priority matrix 6) Optimize the opening hours of facilities 7) Create a time management dashboard 8) Implement a staggered class schedule 9) Develop micro-exercise programs 10) Establish a peer supervision system 11) Gamify time allocation 12) Conduct a time audit 13) Establish industry-university-research cooperation relationships

According to table 4.30, 13 measures were proposed to enhance undergraduate students' sustainable sports participation under the strategy for improving time management.

1) Develop intelligent scheduling tools to help students reasonably plan their study and exercise time.

2) Hold time planning workshops to improve students' time management skills and their ability to arrange exercise time.

3) Integrate physical education into the curriculum, ensure the quality and class hours of physical education courses, and improve the teaching effectiveness of physical education.

4) Utilize wearable technology to monitor students' exercise data in real time, providing a basis for adjusting exercise plans.

5) Establish a priority matrix to help students clarify the priorities of study and exercise and allocate their time reasonably.

6) Optimize the opening hours of facilities to ensure that students have enough opportunities to use sports facilities during their spare time.

7) Create a time management dashboard to visually display students' time utilization and promote self-management.

8) Implement a staggered class schedule to avoid the excessive concentration of students' exercise time and improve the utilization rate of facilities.

9) Develop micro-exercise programs to meet students' exercise needs during fragmented time.

10) Establish a peer supervision system, where students can supervise and encourage each other to improve their participation in sports.

11) Gamify time allocation and motivate students to allocate their time reasonably for exercise through a gamified approach.

12) Conduct a time audit, regularly evaluate students' time utilization efficiency, and make timely improvements when problems are found.

13) Establish industry-university-research cooperation relationships, and with the help of enterprises and scientific research institutions, improve the level of time management for campus sports.

Table 4.31 Strategies and measures to enhancing undergraduate students' sustainable sports participation of strategy for building an incentive and club ecosystem.

Certain aspects	Strategies	Measures
Strategy for Building an Incentive and Club Ecosystem	1.Implement rewards and sponsorships 2.Launch badges and leagues 3.Formulate a framework and conduct promotion	1) Implement a hierarchical reward system 2) Carry out corporate sponsorship programs 3) Launch digital badges 4) Establish an alumni mentoring network 5) Create interdisciplinary sports leagues 6) Integrate gamification elements 7) Implement peer referral incentives 8) Formulate a sustainable development framework for student associations 9) Establish intercollegiate alliances 10) Utilize social media for promotion 11) Create the role of sports ambassadors 12) Implement performance evaluations for student associations

According to table 4.31, 13 measures were proposed to enhance undergraduate students' sustainable sports participation under the strategy for building an incentive and club ecosystem.

1) Implement a hierarchical reward system and provide rewards at different levels according to students' participation in sports and their achievements.

2) Carry out corporate sponsorship programs to attract enterprises to support campus sports activities and provide more resources.

3) Launch digital badges to give digital certification and rewards for students' excellent performance in sports activities.

4) Establish an alumni mentoring network, give play to the exemplary role of alumni, and guide current students to participate in sports activities.

5) Create interdisciplinary sports leagues to promote communication and cooperation among students from different disciplines and improve the level of sports competition.

6) Integrate gamification elements, design interesting sports competitions and challenges, and increase the fun for students to participate in sports.

7) Implement peer referral incentives, encourage students to refer each other to participate in sports activities, and expand the participation group.

8) Formulate a sustainable development framework for student associations to ensure the long-term and stable development of sports associations.

9) Establish intercollegiate alliances, strengthen sports exchanges and cooperation among schools, and jointly promote the development of campus sports.

10) Utilize social media for promotion, promote campus sports activities through social media platforms, and enhance the influence of the activities.

11) Create the role of sports ambassadors, select excellent students to serve as sports ambassadors, and publicize sports culture and activities.

12) Implement performance evaluations for student associations, regularly evaluate the activity effects and development situations of sports associations, and promote the improvement of the associations.

Table 4.32 Strategies and measures to enhancing undergraduate students' sustainable sports participation of strategy for regulating psychological pressure.

Certain aspects	Strategies	Measures
Strategy for Regulating Psychological Pressure	1.Combine sports with	1) Combine physical education with
	mindfulness practice	mindfulness practices
	2.Utilize tools and	2) Establish mental health counseling
	therapies	3) Hold stress management
	3.Establish areas and	workshops
	networks	4) Utilize artificial intelligence mental
		health tools
		5) Carry out exercise therapy
		programs
		6) Cultivate a peer support network
		7) Develop a stress tracking
		application
		8) Integrate physical education into
		academic counseling
		9) Set up stress relief areas
		10) Implement exercise-based art
		therapy

According to table 4.32, 10 measures were proposed to enhance undergraduate students' sustainable sports participation under the Strategy for regulating psychological pressure.

1) Combine physical education with mindfulness practices, and cultivate students' concentration and psychological adjustment ability through sports.

2) Establish mental health counseling to provide students with professional psychological counseling and guidance services.

- 3) Hold stress management workshops to teach students methods and techniques for dealing with stress and improve their psychological resilience.
- 4) Utilize artificial intelligence mental health tools to provide students with convenient mental health assessments and suggestions.
- 5) Carry out exercise therapy programs to relieve students' psychological stress through sports and promote their mental health.
- 6) Cultivate a peer support network, encourage students to support and help each other, and jointly cope with psychological stress.
- 7) Develop a stress tracking application to monitor students' stress levels in real time, detect problems in a timely manner and provide assistance.
- 8) Integrate physical education into academic counseling, pay attention to students' psychological state during academic guidance, and relieve study pressure through sports activities.
- 9) Set up stress relief areas, establish dedicated stress relief places on campus, and provide facilities for relaxation and stress relief.
- 10) Implement exercise-based art therapy, combine sports with art, and innovate the way of psychological adjustment.

Table 4.33 Strategies and measures to enhancing undergraduate students' sustainable sports participation of strategy for reconstructing the family support system.

Certain aspects	Strategies	Measures
Strategy for Reconstructing the Family Support System	1.Strengthen cooperation and provide scholarships	1) Establish home-school cooperation relationships
		2) Provide sports scholarships
	2.Launch workshops and platforms	3) Hold family sports workshops
		4) Develop a digital family platform
	3.Implement subsidies and conduct promotion	5) Sign a family sports contract
		6) Incorporate family health assessments
		7) Establish family counseling services
		8) Form a family sports club
		9) Implement an equipment subsidy plan
		10) Carry out cultural awareness promotion activities
		11) Hold parent training programs
		12) Establish a feedback mechanism
		13) Create a Family Sports Day
		14) Integrate community resources

According to table 4.33, 14 measures were proposed to enhance undergraduate students' sustainable sports participation under the Strategy for reconstructing the family support system.

1) Establish home - school cooperation relationships, strengthen communication and cooperation between schools and families, and jointly promote students' participation in sports.

2) Provide sports scholarships to motivate students to actively participate in sports activities and improve their sports performance.

3) Hold family sports workshops, organize parents and students to participate in sports activities together, and enhance the parent-child relationship.

4) Develop a digital family platform, and use digital technology to promote the sharing and interaction of sports information between families and schools.

5) Sign a family sports contract to clarify the responsibilities and obligations of family members in students' sports participation.

6) Incorporate family health assessments, include the health status of students' families in the assessment system, and encourage families to pay attention to health.

7) Establish family counseling services to provide parents with counseling and guidance on students' sports and health.

8) Form a family sports club, with families as units to participate in sports activities, and create a family sports atmosphere.

9) Implement an equipment subsidy plan to provide families with subsidies for purchasing sports equipment and reduce the cost of family sports.

10) Carry out cultural awareness promotion activities, publicize sports culture and the concept of a healthy life, and increase families' emphasis on sports.

11) Hold parent training programs to improve parents' awareness and ability of students' sports education.

12) Establish a feedback mechanism, promptly understand families' opinions and suggestions on school sports work, and improve the work.

13) Create a Family Sports Day, regularly organize family sports activities, and enhance the physical fitness and cohesion of family members.

14) Integrate community resources, make use of community sports facilities and activities, and provide students with more sports opportunities.

Table 4.34 Strategies and measures to enhancing undergraduate students' sustainable sports participation of strategy for establishing a dynamic risk management system.

Certain aspects	Strategies	Measures
Strategy for Establishing a Dynamic Risk Management System	1.Evaluate risks and	1) Regularly assess health risks
	update procedures	2) Safety monitoring mechanism for facilities
	2.Formulate	3) Risk early warning system
	contingency plans and	4) Update of safety knowledge
	monitoring tools	5) Risk management training for teachers
	3.Formulate	6) Formulation of emergency response plans
	contingency plans and	7) Analysis of accident data
	monitoring tools	8) Design of risk awareness courses
	4.Strengthen	9) Risk feedback channels
	communication and	10) Standardized management of clubs
	joint management	11) Safety inspection of venues
		12) Risk management by schools and families
		13) Monitoring by digital technology
		14) Intervention for psychological stress
		15) Individualized intensity adjustment
		16) Evaluation of risk management

According to table 4.34, 16 measures were proposed to enhance undergraduate students' sustainable sports participation under the strategy for establishing a dynamic risk management system.

1) Regularly assess the physical and mental health risks related to students' participation in sports, identify potential problems in advance, and take preventive measures.

2) Establish a monitoring mechanism for the use and safety of sports facilities to ensure the safety and normal operation of sports facilities.

3) Establish an early warning system for potential risks in sports activities, issue risk warnings in a timely manner, and guarantee the safety of students' sports activities.

4) Continuously update sports safety knowledge and educational content to enhance the safety awareness and response capabilities of students and teachers.

5) Provide regular risk management training for physical education teachers to improve their risk management capabilities.

6) Formulate emergency response plans for various sports-related accidents to ensure a prompt and effective response in case of an accident.

7) Collect and analyze data on students' sports injuries and accidents, summarize experience and lessons, and improve risk management measures.

8) Incorporate risk assessment into the design of physical education courses, and cultivate students' risk awareness and self-protection ability in teaching.

9) Encourage students to report potential risks and problems in a timely manner, establish convenient feedback channels, and deal with problems promptly.

10) Strengthen the management of sports clubs, standardize club activities, and prevent the occurrence of various risks.

11) Conduct regular safety inspections of sports venues and equipment to ensure that the facilities meet safety standards.

12) Establish a communication mechanism between schools and families to jointly manage the risks in students' participation in sports.

13) Utilize digital technology to monitor and manage sports risks, and improve the efficiency and accuracy of risk management.

14) Provide psychological counseling services for students under sports pressure to help them relieve stress and avoid psychological problems.

15) Adjust sports activities and intensity according to students' physical conditions to ensure the suitability and safety of sports.

16) Regularly summarize and evaluate the effectiveness of risk management, and continuously improve risk management work based on the evaluation results.

Table 4.35 Strategies and measures to enhancing undergraduate students' sustainable sports participation of strategy for the collaborative mechanism of stakeholders.

Certain aspects	Strategies	Measures
Strategy for the Collaborative Mechanism of Stakeholders	1.Establish summits and frameworks 2.Establish cooperation and obtain funding 3.Develop platforms	1) Establish a biennial stakeholder summit 2) Carry out joint strategic planning 3) Implement a stakeholder feedback portal 4) Create cross-departmental partnerships 5) Conduct an annual needs assessment 6) Establish a shared governance framework 7) Formulate a joint funding plan 8) Carry out cooperative training programs 9) Create communication channels 10) Establish intergenerational sports programs 11) Develop a shared measurement framework 12) Hold cultural sensitivity workshops 13) Create industry-academic cooperation 14) Establish joint research projects 15) Build a community sports center 16) Implement commendation and rewards 17) Create a digital platform

Table 4.35 (Continued)

Certain aspects	Strategies	Measures
		18) Carry out joint advocacy activities
		19) Conduct an annual assessment of the impact of cooperation
		20) Formulate a sustainable development charter

According to table 4.35, 20 measures were proposed to enhance undergraduate students' sustainable sports participation under the strategy for the collaborative mechanism of stakeholders.

1) Establish a biennial stakeholder summit, bringing together students, teachers, parents, and local policymakers to jointly discuss the development of campus sports.

2) Conduct joint strategic planning, formulate common development goals and action plans to ensure the orderly collaboration of all parties.

3) Implement a stakeholder feedback portal to promptly collect the opinions and suggestions of all parties on sports policies and projects.

4) Create cross-sectoral partnerships with sports organizations, medical institutions, and non-governmental organizations to integrate resources from all parties.

5) Conduct an annual stakeholder needs assessment, clarify the key areas of cooperation, and improve the pertinence of cooperation.

6) Establish a shared governance framework to ensure that all parties have equal rights to speak and participate in sports decision-making.

7) Formulate a joint funding plan to attract financial support from various parties such as the government, enterprises, and alumni for the development of campus sports.

8) Carry out cooperative training programs for teachers, coaches, and student leaders to enhance the professional capabilities and collaborative abilities of all parties.

9) Create communication channels for different stakeholders, such as parent newsletters and student forums, to promote information exchange.

10) Establish intergenerational sports programs between alumni and current students to inherit sports culture and experience.

11) Develop a shared measurement framework to track the outcomes of cooperation, evaluate the effectiveness of cooperation, and provide a basis for continuous improvement.

12) Hold cultural sensitivity workshops to promote the understanding and respect of different viewpoints and needs among all parties.

13) Create industry-academic cooperation to promote sports technology innovation and drive the application and development of science and technology in campus sports.

14) Establish joint research projects to jointly address the obstacles and problems in sports participation and promote the progress of campus sports.

15) Build a community sports center to achieve the sharing of facilities and resources and improve the utilization efficiency of sports resources.

16) Implement stakeholder commendation and rewards to motivate all parties to actively participate in campus sports cooperation.

17) Create a digital platform to promote the construction of the stakeholder network and resource sharing, and improve the efficiency of cooperation.

18) Carry out joint advocacy activities to influence national sports policies and create a favorable policy environment for the development of campus sports.

19) Conduct an annual assessment of the impact of cooperation, comprehensively evaluate the effectiveness and impact of cooperation projects, and summarize experiences and lessons.

20) Formulate a sustainable development charter to ensure that all parties are committed to the sustainable development of campus sports in the long term.

2.2.3 Good health educational management strategies for enhancing undergraduate students' sustainable sports participation.

Based on the findings from questionnaires, interviews, and focus group studies, strategies with relatively high levels of support were selected. Combined with the research results from SWOT and TOWS strategic analyses, a master list of educational management strategies for enhancing undergraduate students' sustainable sports participation was developed, as shown in tables 4.26-4.35. This master list encompasses 10 key aspects, 34 strategies (as illustrated in Figure 4.1), and a total of 131 specific measures (as presented in Table 4.36).

The specific content was as follows:

Table 4.36 The specific measures for enhancing sustainable sports participation of undergraduate students.

Strategies	Measures
Strategies for Innovation of Education and Knowledge System	1. Reconstruct the curriculum system
	2. Innovate the teaching mode
	3. Optimize the evaluation system
	4. Integrate educational resources
	5. Strengthen digital empowerment
	6. Deepen teacher training
	7. Promote policy alignment
	8. Strengthen international integration
	9. Establish a feedback mechanism
	10. Cultivate an innovative ecosystem
Strategies for Optimization of Campus Environment	1. Optimize the layout of campus space
	2. Cultivate the atmosphere of sports culture
	3. Improve the accessibility of facilities
	4. Promote the construction of the club ecosystem
	5. Strengthen digital integration

Table 4.36 (Continued)

Strategies	Measures
	6. Establish a feedback mechanism 7. Green campus initiative 8. Create an inclusive space 9. Time period management 10. Policy support framework
Strategies for Cultivation of Health Awareness	1. Develop interactive health courses 2. Establish a peer health tutor system 3. Carry out health literacy promotion activities 4. Implement health passports 5. Establish a health literacy assessment 6. Promote interdisciplinary cooperation 7. Utilize artificial intelligence health 8. Establish a health ambassador program 9. Integrate health into academic courses 10. Formulate health literacy standards 11. Conduct health impact assessments
Strategies for Intervention in Living Habits	1. Develop a personalized habit plan 2. Implement a habit tracking system 3. Create a supportive environment 4. Cultivate a sense of social responsibility 5. Gamify habit formation 6. Integrate health into academic curriculums 7. Utilize digital platforms 8. Establish a health contract 9. Hold time management workshops 10. Conduct health audits 11. Build community gardens

Table 4.36 (Continued)

Strategies	Measures
	12. Create smoke-free or alcohol-restricted areas 13. Create an environment conducive to sleep 14. Hold cultural celebration activities 15. Monitor and adjust strategies
Strategies for Improvement of Time Management	1. Develop intelligent scheduling tools 2. Hold time planning workshops 3. Integrate physical education into the curriculum 4. Utilize wearable technology 5. Establish a priority matrix 6. Optimize the opening hours of facilities 7. Create a time management dashboard 8. Implement a staggered class schedule 9. Develop micro-exercise programs 10. Establish a peer supervision system 11. Gamify time allocation 12. Conduct a time audit 13. Establish industry -university -research cooperation relationships
Strategies for Construction of Incentive and Club Ecosystem	1. Implement a hierarchical reward system 2. Carry out corporate sponsorship programs 3. Launch digital badges 4. Establish an alumni mentoring network 5. Create interdisciplinary sports leagues 6. Integrate gamification elements 7. Implement peer referral incentives 8. Formulate a sustainable development framework for student associations

Table 4.36 (Continued)

Strategies	Measures
Strategies for Regulation of Psychological Stress	9. Establish intercollegiate alliances 10. Utilize social media for promotion 11. Create the role of sports ambassadors 12. Implement performance evaluations for student associations
	1. Combine physical education with mindfulness practices 2. Establish mental health counseling 3. Hold stress management workshops 4. Utilize artificial intelligence mental health tools 5. Carry out exercise therapy programs 6. Cultivate a peer support network 7. Develop a stress tracking application 8. Integrate physical education into academic counseling 9. Set up stress relief areas 10. Implement exercise-based art therapy
	1. Establish home-school cooperation relationships 2. Provide sports scholarships 3. Hold family sports workshops 4. Develop a digital family platform 5. Sign a family sports contract 6. Incorporate family health assessments 7. Establish family counseling services 8. Form a family sports club 9. Implement an equipment subsidy plan 10. Carry out cultural awareness promotion activities

Table 4.36 (Continued)

Strategies	Measures
	11. Hold parent training programs 12. Establish a feedback mechanism 13. Create a Family Sports Day 14. Integrate community resources
Strategies for Establishment of Dynamic Risk Management System	1. Regularly assess health risks 2. Safety monitoring mechanism for facilities 3. Risk early warning system 4. Update of safety knowledge 5. Risk management training for teachers 6. Formulation of emergency response plans 7. Analysis of accident data 8. Design of risk awareness courses 9. Risk feedback channels 10. Standardized management of clubs 11. Safety inspection of venues 12. Risk management by schools and families 13. Monitoring by digital technology 14. Intervention for psychological stress 15. Individualized intensity adjustment 16. Evaluation of risk management
Strategies for Collaborative Mechanism of Stakeholders	1. Establish a biennial stakeholder summit 2. Carry out joint strategic planning 3. Implement a stakeholder feedback portal 4. Create cross-departmental partnerships 5. Conduct an annual needs assessment 6. Establish a shared governance framework 7. Formulate a joint funding plan

Table 4.36 (Continued)

Strategies	Measures
	8. Carry out cooperative training programs 9. Create communication channels 10. Establish intergenerational sports programs 11. Develop a shared measurement framework 12. Hold cultural sensitivity workshops 13. Create industry-academic cooperation 14. Establish joint research projects 15. Build a community sports center 16. Implement commendation and rewards 17. Create a digital platform 18. Carry out joint advocacy activities 19. Conduct an annual assessment of the impact of cooperation 20. Formulate a sustainable development charter

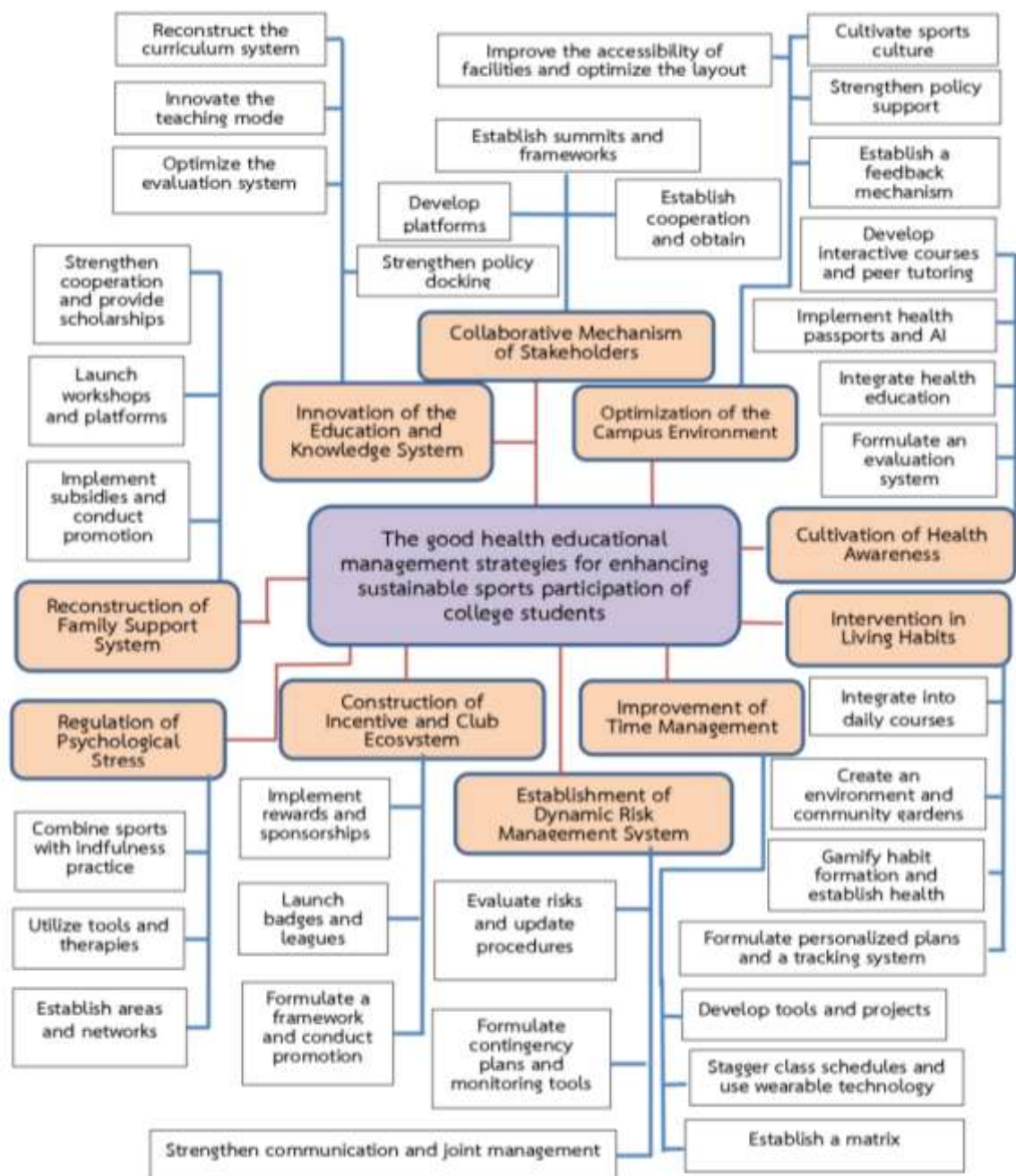


Figure 4.1 Strategy system framework for enhancing undergraduate students' sustainable sports participation

2.3 Summary of Development Strategies

Based on the provided strategies for enhancing the sustainable sports participation of undergraduate students, the following was a structured outline of the comprehensive strategies formulated using the results of the SWOT analysis:

2.3.1 Vision

A positive campus sports culture is fostered, making sports a daily habit for undergraduates and cultivating lifelong exercise awareness. We built an integrated education system covering health knowledge, sports skills and more to enhance their health literacy and sports capabilities, while establishing a diversified collaboration network with schools, families, communities and the sports industry to provide sports participation support. We innovated sports programs and facilities, created a sustainable campus sports ecosystem, contributed to global youth sports through international exchanges, and applied advanced technologies like big data and virtual reality to boost campus sports' appeal.

2.3.2 Mission

1) Provide high-quality physical education: Design and implement high-quality, student-centered physical education courses and activities, impart professional sports knowledge and skills, and stimulate students' love for sports and enthusiasm for active participation.

2) Optimize the allocation of sports resources: Reasonably plan and utilize campus sports venues, equipment, and other resources to ensure the efficient use of sports resources. At the same time, improve the accessibility and convenience of sports facilities to meet the sports needs of different students.

3) Cultivate health awareness and habits: Through various channels and methods, cultivate the health awareness of undergraduate students, help them master scientific health management methods, and develop good sports exercise and healthy living habits.

4) Promote the development of sports associations: Vigorously support the growth of various sports associations, provide necessary guidance, resources, and activity spaces for the associations, promote the standardization and

diversification of association activities, and enhance the attractiveness and cohesion of the associations to students.

5) Facilitate collaboration among stakeholders: Build an effective communication and collaboration platform, guide various stakeholders, including different departments of the school, families, communities, and enterprises, to actively participate in the work of enhancing undergraduate students' sports participation, and form a strong joint force.

6) Conduct sports research and evaluation: Actively carry out research in physical education, sports science, sports management, and other aspects, establish a scientific and reasonable sports participation evaluation system, and continuously improve sports work based on the evaluation results to improve the quality of sports services.

7) Disseminate sports culture and spirit: Through holding various sports cultural activities, competitions, and promotional activities, disseminate sports culture, carry forward the sports spirit, and cultivate undergraduate students' qualities of teamwork, competitive awareness, and perseverance.

2.3.3 Goals

1) Increase the sports participation rate: Within this academic year, increase the proportion of undergraduate students who regularly participate in sports activities by 15%. Through carrying out diverse sports activities and publicity and guidance, attract more students to take the initiative to participate in physical exercise.

2) Improve health literacy: Within two semesters, with the help of standardized health literacy tests, increase the average health literacy score of undergraduate students by 10%. Achieve this goal by offering health courses, holding health lectures, etc.

3) Improve health conditions: Within one year, reduce the incidence rate of health problems among undergraduate students caused by bad living habits by 12%, such as reducing problems like obesity, myopia, and anxiety, and achieve this through lifestyle intervention strategies.

4) Enhance facility satisfaction: By the end of the academic year, ensure that 80% of students express a high level of satisfaction with campus sports facilities and services, and achieve this by optimizing facility construction and improving service quality.

5) Develop new sports programs: Within the next two years, develop and implement at least 3 interdisciplinary innovative sports programs, integrating knowledge from multiple disciplines to enrich the content of physical education.

6) Strengthen external cooperation: Within one year, establish cooperative relationships with at least 2 external sports organizations, enterprises, or health institutions, introduce external resources, and expand the development space of campus sports.

7) Expand the scale of sports associations: Within this academic year, increase the number of members of sports associations by 20%, and achieve this through measures such as supporting the development of associations and holding association activities.

Results of evaluating the feasibility and adaptability of the good health educational management strategies for enhancing sustainable sports participation of undergraduate students.

3.1 Analysis of evaluating the feasibility and adaptability of the good health educational management strategies for enhancing sustainable sports participation of undergraduate students.

In the final stage, 5 experts from universities in China and Thailand were again selected through purposive sampling. The selection criteria included holding an academic rank of associate professor or above, having more than 5 years of work experience in related fields, and possessing practical operational experience and theoretical research ability in evaluating educational management strategies. These experts evaluated the proposed strategies using an evaluation form designed based on a 5-point Likert scale, focusing on assessing the feasibility and adaptability of the

educational management strategies for enhancing undergraduate students' continuous sports participation.

Table 4.37 Analysis results of strategies evaluation.

(n=5)

The Strategies for Enhancing Sustainable Sports Participation of Undergraduate Students	Feasibility			Adaptability		
	$\bar{x}$	S.D.	result	$\bar{x}$	S.D.	result
1.Strategies for Innovation of Education and Knowledge System	4.48	0.18	High	4.39	0.15	High
2.Strategies for Optimization of Campus Environment	4.37	0.15	High	4.29	0.12	High
3.Strategies for Cultivation of Health Awareness	4.44	0.12	High	4.43	0.08	High
4.Strategies for Intervention in Living Habits	4.39	0.11	High	4.44	0.09	High
5.Strategies for Improvement of Time Management	4.68	0.12	Highest	4.59	0.12	Highest
6.Strategies for Construction of Incentive and Club Ecosystem	4.56	0.11	Highest	4.56	0.09	Highest
7.Strategies for Regulation of Psychological Stress	4.51	0.09	Highest	4.47	0.10	High
8.Strategies for Reconstruction of Family Support System	4.54	0.09	Highest	4.46	0.12	High
9.Strategies for Establishment of Dynamic Risk Management System	4.50	0.07	Highest	4.53	0.11	Highest
10.Strategies for Collaborative Mechanism of Stakeholders	4.57	0.07	Highest	4.61	0.11	Highest
Total	4.50	0.11	Highest	4.48	0.11	High

According to table 4.37, the average adaptability of the ten strategies for enhancing sustainable sports participation of undergraduate students ranged from 4.29 to 4.61, with an overall average of 4.48, at a high to highest level. The average feasibility of these strategies ranged from 4.37 to 4.68, with an overall average of 4.50, also at a high to highest level. This indicated that the strategies for enhancing sustainable sports participation of undergraduate students had high feasibility and adaptability.

Table 4.38 Analysis results of strategies evaluation strategies for innovation of education and knowledge system.

(n=5)

Assessment checklist	Feasibility			Adaptability		
	$\bar{x}$	S.D.	result	$\bar{x}$	S.D.	result
Strategies for Innovation of Education and Knowledge System						
1. Reconstruct the curriculum system	4.58	0.25	Highest	4.56	0.25	Highest
2. Innovate the teaching mode	4.64	0.11	Highest	4.64	0.11	Highest
3. Optimize the evaluation system	4.54	0.05	Highest	4.54	0.05	Highest
4. Integrate educational resources	4.52	0.19	Highest	4.60	0.07	Highest
5. Strengthen digital empowerment	4.52	0.25	Highest	4.56	0.22	Highest
6. Deepen teacher training	4.52	0.19	Highest	3.82	0.41	High
7. Promote policy alignment	4.94	0.05	Highest	4.96	0.05	Highest
8. Strengthen international integration	4.72	0.19	Highest	4.74	0.11	Highest
9. Establish a feedback mechanism	3.72	0.29	High	3.82	0.15	High
10. Cultivate an innovative ecosystem	4.08	0.19	High	3.66	0.09	High
Total	4.48	0.18	High	4.39	0.15	High

According to table 4.38, the average adaptability of the strategies for innovation of the education and knowledge system to enhance sustainable sports participation of undergraduate students ranged from 3.66 to 4.96, with an overall average of 4.39, at a high to highest level. The average feasibility of these strategies

ranged from 3.72 to 4.94, with an overall average of 4.48, also at a high to highest level. This indicated that the strategies for innovation of the education and knowledge system had high feasibility and adaptability.

Table 4.39 Analysis results of strategies for optimization of campus environment.

(n=5)

Assessment checklist	Feasibility			Adaptability		
	$\bar{X}$	S.D.	result	$\bar{X}$	S.D.	result
Strategies for Optimization of Campus Environment						
1. Optimize the layout of campus space	4.60	0.10	Highest	4.56	0.09	Highest
2. Cultivate the atmosphere of sports culture	4.68	0.15	Highest	4.74	0.11	Highest
3. Improve the accessibility of facilities	4.52	0.19	Highest	4.52	0.19	Highest
4. Promote the construction of the club ecosystem	3.54	0.15	High	3.66	0.09	High
5. Strengthen digital integration	4.04	0.18	High	4.10	0.10	High
6. Establish a feedback mechanism	3.78	0.19	High	3.92	0.24	High
7. Green campus initiative	4.50	0.16	High	4.50	0.16	Highest
8. Create an inclusive space	4.52	0.22	Highest	4.58	0.13	Highest
9. Time period management	4.64	0.11	Highest	3.54	0.05	High
10. Policy support framework	4.86	0.09	Highest	4.82	0.04	Highest
Total	4.37	0.15	High	4.29	0.12	High

According to table 4.39, the average adaptability of the strategies for optimization of the campus environment to enhance sustainable sports participation of undergraduate students ranged from 3.54 to 4.82, with an overall average of 4.29, at a high level. The average feasibility of these strategies ranged from 3.54 to 4.86, with an overall average of 4.37, also at a high level. This indicated that the strategies for optimization of the campus environment had high feasibility and adaptability.

Table 4.40 Analysis results of strategies for cultivation of health awareness.

(n=5)

Assessment checklist	Feasibility			Adaptability		
	$\bar{X}$	S.D.	result	$\bar{X}$	S.D.	result
Strategies for Cultivation of Health Awareness						
1. Develop interactive health courses	4.74	0.11	Highest	4.78	0.08	Highest
2. Establish a peer health tutor system	4.58	0.08	Highest	4.54	0.05	Highest
3. Carry out health literacy promotion activities	3.52	0.08	High	3.50	0.07	High
4. Implement health passports	4.68	0.15	Highest	4.64	0.09	Highest
5. Establish a health literacy assessment	4.54	0.05	Highest	4.56	0.05	Highest
6. Promote interdisciplinary cooperation	3.76	0.09	High	3.74	0.05	High
7. Utilize artificial intelligence health	4.68	0.13	Highest	4.74	0.11	Highest
8. Establish a health ambassador program	4.58	0.15	Highest	4.54	0.05	Highest
9. Integrate health into academic courses	4.72	0.19	Highest	4.78	0.04	Highest
10. Formulate health literacy standards	4.94	0.09	Highest	4.92	0.08	Highest
11. Conduct health impact assessments	4.08	0.19	High	4.00	0.20	High
Total	4.44	0.12	High	4.43	0.08	High

According to table 4.40, the average adaptability of the strategies for cultivation of health awareness to enhance sustainable sports participation of undergraduate students ranged from 3.50 to 4.92, with an overall average of 4.43, at a high level. The average feasibility of these strategies ranged from 3.52 to 4.94, with

an overall average of 4.44, also at a high level. This indicated that the strategies for cultivation of health awareness had high feasibility and adaptability.

Table 4.41 Analysis results of strategies for intervention in living habits.

(n=5)

Assessment checklist	Feasibility			Adaptability		
	$\bar{X}$	S.D.	result	$\bar{X}$	S.D.	result
Strategies for Intervention in Living Habits						
1. Develop a personalized habit plan	4.88	0.08	Highest	4.92	0.08	Highest
2. Implement a habit tracking system	4.80	0.12	Highest	4.82	0.04	Highest
3. Create a supportive environment	4.72	0.19	Highest	4.82	0.18	Highest
4. Cultivate a sense of social responsibility	4.64	0.11	Highest	4.68	0.13	Highest
5. Gamify habit formation	4.54	0.11	Highest	4.46	0.11	High
6. Integrate health into academic curriculums	4.96	0.05	Highest	4.98	0.04	Highest
7. Utilize digital platforms	4.78	0.04	Highest	4.76	0.05	Highest
8. Establish a health contract	4.56	0.05	Highest	4.62	0.08	Highest
9. Hold time management workshops	4.52	0.08	Highest	4.52	0.08	Highest
10. Conduct health audits	3.54	0.11	High	3.62	0.13	High
11. Build community gardens	4.56	0.05	Highest	4.60	0.07	Highest
12. Create smoke-free or alcohol-restricted areas	3.70	0.20	High	3.96	0.09	High
13. Create an environment conducive to sleep	4.60	0.12	Highest	4.60	0.07	Highest
14. Hold cultural celebration activities	3.54	0.09	High	3.62	0.11	High
15. Monitor and adjust strategies	3.50	0.16	High	3.68	0.04	High
Total	4.39	0.11	High	4.44	0.09	High

According to table 4.41, the average adaptability of the strategies for intervention in living habits to enhance sustainable sports participation of undergraduate students ranged from 3.62 to 4.98, with an overall average of 4.44, at a high level. The average feasibility of these strategies ranged from 3.50 to 4.96, with an overall average of 4.39, also at a high level. This indicated that the strategies for intervention in living habits had high feasibility and adaptability.

Table 4.42 Analysis results of strategies for improvement of time management.

(n=5)

Assessment checklist	Feasibility			Adaptability		
	$\bar{X}$	S.D.	result	$\bar{X}$	S.D.	result
Strategies for Improvement of Time Management						
1. Develop intelligent scheduling tools	4.80	0.16	Highest	4.84	0.15	Highest
2. Hold time planning workshops	4.82	0.04	Highest	4.78	0.11	Highest
3. Integrate physical education into the curriculum	4.88	0.11	Highest	4.78	0.04	Highest
4. Utilize wearable technology	4.70	0.07	Highest	4.70	0.07	Highest
5. Establish a priority matrix	4.82	0.15	Highest	4.84	0.11	Highest
6. Optimize the opening hours of facilities	4.58	0.15	Highest	4.78	0.11	Highest
7. Create a time management dashboard	4.72	0.08	Highest	4.80	0.12	Highest
8. Implement a staggered class schedule	4.84	0.15	Highest	4.44	0.17	High
9. Develop micro-exercise programs	4.76	0.11	Highest	4.76	0.11	Highest
10. Establish a peer supervision system	4.52	0.08	Highest	4.56	0.11	Highest
11. Gamify time allocation	4.72	0.13	Highest	4.64	0.23	Highest

Table 4.42 (Continued)

(n=5)

Assessment checklist	Feasibility			Adaptability		
	$\bar{X}$	S.D.	result	$\bar{X}$	S.D.	result
12. Conduct a time audit	4.06	0.21	High	3.98	0.15	High
13. Establish industry -university - research cooperation relationships	4.58	0.08	Highest	3.72	0.08	High
Total	4.68	0.12	Highest	4.59	0.12	Highest

According to table 4.42, the average adaptability of the strategies for improvement of time management to enhance sustainable sports participation of undergraduate students ranged from 3.72 to 4.84, with an overall average of 4.59, at the highest level. The average feasibility of these strategies ranged from 4.06 to 4.88, with an overall average of 4.68, also at the highest level. This indicated that the strategies for improvement of time management had high feasibility and adaptability.

Table 4.43 Analysis results of strategies for construction of incentive and club ecosystem.

(n=5)

Assessment checklist	Feasibility			Adaptability		
	$\bar{X}$	S.D.	result	$\bar{X}$	S.D.	result
Strategies for Construction of Incentive and Club Ecosystem						
1. Implement a hierarchical reward system	4.94	0.09	Highest	4.98	0.04	Highest
2. Carry out corporate sponsorship programs	4.76	0.15	Highest	4.70	0.07	Highest
3. Launch digital badges	4.62	0.08	Highest	4.58	0.08	Highest
4. Establish an alumni mentoring network	4.58	0.08	Highest	4.54	0.09	Highest

Table 4.43 (Continued)

(n=5)

Assessment checklist	Feasibility			Adaptability		
	$\bar{X}$	S.D.	result	$\bar{X}$	S.D.	result
5. Create interdisciplinary sports leagues	4.72	0.08	Highest	4.78	0.04	Highest
6. Integrate gamification elements	4.82	0.08	Highest	4.76	0.11	Highest
7. Implement peer referral incentives	4.66	0.09	Highest	4.70	0.10	Highest
8. Formulate a sustainable development framework for student associations	4.58	0.08	Highest	4.58	0.08	Highest
9. Establish intercollegiate alliances	3.88	0.13	High	4.06	0.23	High
10. Utilize social media for promotion	3.72	0.16	High	3.58	0.08	High
11. Create the role of sports ambassadors	4.68	0.18	Highest	4.72	0.08	Highest
12. Implement performance evaluations for student associations	4.72	0.13	Highest	4.78	0.08	Highest
Total	4.56	0.11	Highest	4.56	0.09	Highest

According to table 4.43, the average adaptability of the strategies for construction of incentive and club ecosystem to enhance sustainable sports participation of undergraduate students ranged from 3.58 to 4.98, with an overall average of 4.56, at the highest level. The average feasibility of these strategies ranged from 3.72 to 4.94, with an overall average of 4.56, also at the highest level. This indicated that the strategies for construction of incentive and club ecosystem had high feasibility and adaptability.

Table 4.44 Analysis results of strategies for regulation of psychological stress.

(n=5)

Assessment checklist	Feasibility			Adaptability		
	$\bar{X}$	S.D.	result	$\bar{X}$	S.D.	result
Strategies for Regulation of Psychological Stress						
1. Combine physical education with mindfulness practices	4.54	0.11	Highest	4.62	0.13	Highest
2. Establish mental health counseling	4.82	0.11	Highest	4.90	0.14	Highest
3. Hold stress management workshops	4.74	0.11	Highest	4.68	0.04	Highest
4. Utilize artificial intelligence mental health tools	4.64	0.05	Highest	4.68	0.08	Highest
5. Carry out exercise therapy programs	4.56	0.05	Highest	4.58	0.04	Highest
6. Cultivate a peer support network	4.54	0.05	Highest	4.38	0.11	High
7. Develop a stress tracking application	4.58	0.08	Highest	4.40	0.10	High
8. Integrate physical education into academic counseling	4.70	0.10	Highest	4.78	0.15	Highest
9. Set up stress relief areas	4.38	0.11	High	3.92	0.08	High
10. Implement exercise-based art therapy	3.64	0.09	High	3.74	0.15	High
Total	4.51	0.09	Highest	4.47	0.10	High

According to table 4.44, the average adaptability of the strategies for regulation of psychological stress to enhance sustainable sports participation of undergraduate students ranged from 3.74 to 4.90, with an overall average of 4.47, at a high level. The average feasibility of these strategies ranged from 3.64 to 4.82, with an overall average of 4.51, at the highest level. This indicated that the strategies for regulation of psychological stress had high feasibility and adaptability.

Table 4.45 Analysis results of strategies for reconstruction of family support system.

(n=5)

Assessment checklist	Feasibility			Adaptability		
	$\bar{X}$	S.D.	result	$\bar{X}$	S.D.	result
Strategies for Reconstruction of Family Support System						
1. Establish home-school cooperation relationships	4.84	0.11	Highest	4.94	0.09	Highest
2. Provide sports scholarships	4.82	0.08	Highest	4.64	0.18	Highest
3. Hold family sports workshops	4.76	0.11	Highest	4.76	0.11	Highest
4. Develop a digital family platform	4.58	0.08	Highest	4.38	0.18	High
5. Sign a family sports contract	4.50	0.07	Highest	4.56	0.09	Highest
6. Incorporate family health assessments	4.52	0.08	Highest	4.58	0.08	Highest
7. Establish family counseling services	4.22	0.16	High	4.52	0.15	Highest
8. Form a family sports club	4.56	0.05	Highest	4.56	0.05	Highest
9. Implement an equipment subsidy plan	4.84	0.11	Highest	4.94	0.09	Highest
10. Carry out cultural awareness promotion activities	4.74	0.05	Highest	4.04	0.21	High
11. Hold parent training programs	4.54	0.11	Highest	4.52	0.04	Highest
12. Establish a feedback mechanism	3.50	0.07	High	3.68	0.13	High
13. Create a Family Sports Day	4.54	0.11	Highest	4.64	0.13	Highest
14. Integrate community resources	4.52	0.05	Highest	3.64	0.11	High
Total	4.54	0.09	Highest	4.46	0.12	High

According to table 4.45, the average adaptability of the strategies for the reconstruction of the family support system aimed at enhancing undergraduate students' sustainable sports participation spanned from 3.64 to 4.94. With an overall average of 4.46, these strategies were at a high level. Regarding feasibility, the average scores ranged from 3.50 to 4.84, with an overall average of 4.54, reaching the highest

level. This clearly showed that the strategies for the reconstruction of the family support system possessed high feasibility and adaptability.

Table 4.46 Analysis results of strategies for establishment of dynamic risk management system.

Assessment checklist	(n=5)					
	Feasibility			Adaptability		
	$\bar{X}$	S.D.	result	$\bar{X}$	S.D.	result
Strategies for Establishment of Dynamic Risk Management System						
1. Regularly assess health risks	4.98	0.04	Highest	4.92	0.08	Highest
2. Safety monitoring mechanism for facilities	4.90	0.07	Highest	4.92	0.08	Highest
3. Risk early warning system	4.84	0.11	Highest	4.88	0.13	Highest
4. Update of safety knowledge	3.82	0.08	High	3.92	0.08	High
5. Risk management training for teachers	4.78	0.04	Highest	4.80	0.07	Highest
6. Formulation of emergency response plans	4.54	0.05	Highest	4.58	0.08	Highest
7. Analysis of accident data	4.82	0.13	Highest	4.88	0.13	Highest
8. Design of risk awareness courses	4.74	0.05	Highest	4.80	0.12	Highest
9. Risk feedback channels	4.54	0.05	Highest	4.60	0.10	Highest
10. Standardized management of clubs	3.84	0.05	High	3.92	0.08	High
11. Safety inspection of venues	4.62	0.08	Highest	4.74	0.05	Highest
12. Risk management by schools and families	4.32	0.08	High	4.58	0.13	Highest
13. Monitoring by digital technology	4.58	0.08	Highest	4.64	0.05	Highest
14. Intervention for psychological stress	4.28	0.04	High	4.02	0.27	High

Table 4.46 (Continued)

(n=5)

Assessment checklist	Feasibility			Adaptability		
	$\bar{X}$	S.D.	result	$\bar{X}$	S.D.	result
15. Individualized intensity adjustment	4.58	0.04	Highest	4.60	0.07	Highest
16. Evaluation of risk management	3.74	0.09	High	3.62	0.13	High
Total	4.50	0.07	Highest	4.53	0.11	Highest

According to table 4.46, the average adaptability of the strategies for establishment of dynamic risk management system to enhance sustainable sports participation of undergraduate students ranged from 3.62 to 4.92, with an overall average of 4.53, at the highest level. The average feasibility of these strategies ranged from 3.74 to 4.98, with an overall average of 4.50, also at the highest level. This indicated that the strategies for establishment of dynamic risk management system had high feasibility and adaptability.

Table 4.47 Analysis results of strategies for collaborative mechanism of stakeholders.

(n=5)

Assessment checklist	Feasibility			Adaptability		
	$\bar{X}$	S.D.	result	$\bar{X}$	S.D.	result
Strategies for Collaborative Mechanism of Stakeholders						
1. Establish a biennial stakeholder summit	4.94	0.09	Highest	4.98	0.04	Highest
2. Carry out joint strategic planning	4.90	0.07	Highest	4.92	0.08	Highest
3. Implement a stakeholder feedback portal	4.68	0.04	Highest	4.74	0.11	Highest
4. Create cross-departmental partnerships	4.76	0.05	Highest	4.86	0.13	Highest

Table 4.47 (Continued)

(n=5)

Assessment checklist	Feasibility			Adaptability		
	$\bar{X}$	S.D.	result	$\bar{X}$	S.D.	result
5. Conduct an annual needs assessment	4.80	0.07	Highest	4.78	0.08	Highest
6. Establish a shared governance framework	4.90	0.10	Highest	4.74	0.13	Highest
7. Formulate a joint funding plan	4.84	0.11	Highest	4.90	0.10	Highest
8. Carry out cooperative training programs	4.72	0.08	Highest	4.76	0.05	Highest
9. Create communication channels	4.58	0.08	Highest	4.64	0.09	Highest
10. Establish intergenerational sports programs	4.54	0.05	Highest	4.28	0.22	High
11. Develop a shared measurement framework	4.56	0.05	Highest	4.42	0.16	High
12. Hold cultural sensitivity workshops	4.52	0.04	Highest	4.56	0.09	Highest
13. Create industry-academic cooperation	4.60	0.07	Highest	4.46	0.11	High
14. Establish joint research projects	4.68	0.04	Highest	4.68	0.08	Highest
15. Build a community sports center	4.54	0.05	Highest	4.44	0.09	High
16. Implement commendation and rewards	4.32	0.08	High	4.52	0.08	Highest
17. Create a digital platform	4.30	0.07	High	4.26	0.15	High
18. Carry out joint advocacy activities	4.62	0.08	Highest	4.74	0.05	Highest
19. Conduct an annual assessment of the impact of cooperation	3.86	0.13	High	3.98	0.23	High
20. Formulate a sustainable development charter	3.72	0.08	High	4.54	0.09	Highest
Total	4.57	0.07	Highest	4.61	0.11	Highest

According to table 4.47, the average adaptability of the strategies for the collaborative mechanism of stakeholders to enhance sustainable sports participation of undergraduate students ranged from 3.98 to 4.98, with an overall average of 4.61, at the highest level. The average feasibility of these strategies ranged from 3.72 to 4.94, with an overall average of 4.57, also at the highest level. This indicated that the strategies for the collaborative mechanism of stakeholders had high feasibility and adaptability.

The research presented a detailed overview of various strategies aimed at enhancing undergraduate students' sustainable sports participation. These strategies covered a range of focus areas, including educational and knowledge system, campus environment, health awareness, living habits, time management, incentive and club ecosystem, psychological stress regulation, family support system, dynamic risk management, and stakeholder collaboration. Each strategy included specific measures designed to achieve targeted outcomes, reflecting a systematic approach to improving different aspects of undergraduate students' sports participation.

The strategy for innovating the educational and knowledge system focused on reconstructing the curriculum system, innovating teaching methods, and strengthening digital empowerment to enhance students' understanding and engagement in sports from an educational perspective. The strategy for optimizing the campus environment aimed to improve the spatial layout, cultivate a sports culture atmosphere, and enhance facility accessibility to create a more favorable campus environment for sports participation.

Enhancing health awareness was another key strategy, which involved developing interactive health courses, implementing health passports, and leveraging AI health coaches to integrate health education into students' academic and daily lives. The strategy for intervening in living habits was designed to help students form good living habits conducive to sports participation through measures like developing personalized habit plans and implementing habit-tracking systems.

Improving time management was also a significant strategy, focusing on developing intelligent scheduling tools, integrating sports into the curriculum, and

establishing a priority matrix to help students balance study and sports. The strategy for constructing the incentive and club ecosystem aimed to establish a sound incentive mechanism and a vibrant club ecosystem by implementing tiered reward systems and creating interdisciplinary sports leagues.

The strategy for regulating psychological stress focused on alleviating students' psychological stress through integrating sports with mindfulness, establishing mental health counseling, and implementing stress management workshops. The strategy for reconstructing the family support system sought to strengthen the role of families in promoting students' sports participation by establishing school-family partnerships and providing sports scholarships.

The strategy for establishing a dynamic risk management system was designed to ensure the safety of students' sports participation by regularly assessing risks, setting up monitoring mechanisms, and developing emergency response plans. The strategy for the collaborative mechanism of stakeholders aimed to promote cooperation among various stakeholders, including students, faculty, parents, and local policymakers, through measures like establishing biennial stakeholder summits and creating cross-sector partnerships.

The development of these strategies typically involved several steps: studying the current situation and expected situation of undergraduate students' sustainable sports participation, as well as the supporting factors; setting clear goals such as increasing the sports participation rate and improving health literacy; designing an action plan based on SWOT and TOWS analyses and expert interviews; allocating necessary resources; and implementing the strategies with ongoing monitoring. Evaluating the effectiveness of these strategies involved using a five-level scoring table to assess feasibility and adaptability, tracking progress, and making adjustments based on feedback.

In summary, this research outlined a comprehensive approach to strategy development and evaluation, emphasizing the importance of thoughtful planning, resource allocation, and continuous improvement in enhancing undergraduate students' sustainable sports participation across various aspects.

Chapter 5

Discussion Conclusion and Recommendations

Research on good health educational management strategies for enhancing sustainable sports participation of undergraduate students. The purposes of this study are as follows: 1. to study the current conditions and desired conditions that enhance sustainable sports participation among undergraduate students; 2. to develop good health educational management strategies for enhancing sustainable sports participation among undergraduate students; 3. to evaluate the feasibility and adaptability of the good health educational management strategies for enhancing sustainable sports participation among undergraduate students.

This study covers eight aspects: 1) Educational knowledge; 2) Campus environment; 3) Health awareness; 4) Living habits; 5) Time management; 6) Incentive mechanisms and sports clubs; 7) Psychological state and stress; 8) Family influence.

The sample group of this research consisted of 384 students for questionnaires, 16 teachers and education administrators for interview, 12 experts for focus group discussion, and 5 experts for strategies evaluation. The students were sampled through stratified random sampling, while others were selected by purposive sampling.

The research instruments included questionnaires, interviews, SWOT and TOWS matrices for strategy development, and evaluation form. The statistics used to analyze the data were percentages, mean, standard deviations, Modified Priority Needs Index (PNI modified), and content analysis.

The conclusions, discussions, and recommendations of this study are as follows:

Conclusion

In the research on good health educational management strategies for enhancing sustainable sports participation of undergraduate students, the researchers followed the following procedures:

Phase 1: Results of studying the current situation and desired conditions that enhance sustainable sports participation of undergraduate students.

Phase 2: Results of developing the good health educational management strategies for enhancing sustainable sports participation of undergraduate students.

Phase 3: Results of evaluating the feasibility and adaptability of the strategies for enhancing sustainable sports participation of undergraduate students.

The details of the research conclusions were as follow:

Phase 1: Results of studying the current situation, desired conditions and supporting factors that enhance sustainable sports participation of undergraduate students

1. The current situation, desired conditions and supporting factors that enhance sustainable sports participation of undergraduate students

To sum up, in line with the first research objective, this study examines the current status of sustainable sports participation among surveyed undergraduate students from eight dimensions: Educational and Knowledge, Campus Environment, Health and Awareness, Living Habits, Time Management, Incentive and Club, Psychology and Stress, and Family Influence. Statistical analysis of questionnaire data shows that the overall current status of sustainable sports participation among the surveyed students is at a moderate level. Based on the mean values of the eight dimensions, the order from highest to lowest is as follows: Psychology and Stress Dimension, Campus Environment Dimension, Living Habits Dimension, Health and Awareness Dimension, Time Management Dimension, Family Influence Dimension, Educational and Knowledge Dimension, and Incentive and Club Dimension.

The desired status of sustainable sports participation among the surveyed students is generally at a high level, with improvement needs in all dimensions. The

Incentive and Club Dimension has the highest modified PNI value, indicating that students have the strongest demand for improvement in this dimension. The order of modified PNI values from highest to lowest is: Incentive and Club Dimension, Educational and Knowledge Dimension, Family Influence Dimension, Time Management Dimension, Health and Awareness Dimension, Living Habits Dimension, Campus Environment Dimension, and Psychology and Stress Dimension.

The Educational and Knowledge Dimension is at a moderate level. Analysis results reveal that the sub-aspects of this dimension, ranked by mean values from highest to lowest, are: Rationality of the Arrangement of School Health Education Courses, Helpfulness of Obtaining Health Knowledge Outside Class, Practicality of Knowledge and Skill Improvement in Courses, and Enthusiasm for Participation Stimulated by Teaching Methods. The desired status of this dimension is at a high level, with improvement expectations in all sub-aspects. Among them, Enthusiasm for Participation Stimulated by Teaching Methods has the highest modified PNI value, which is the sub-aspect with the strongest improvement demand. The order of modified PNI values from highest to lowest is: Enthusiasm for Participation Stimulated by Teaching Methods, Practicality of Knowledge and Skill Improvement in Courses, Helpfulness of Obtaining Health Knowledge Outside Class, and Rationality of the Arrangement of School Health Education Courses.

The Campus Environment Dimension is at a relatively favorable level. According to analysis results, the sub-aspects of this dimension, ranked by mean values from highest to lowest, are: Attractiveness of School Sports Activities, Intensity of the Campus Sports Atmosphere, and Completeness and Usability of Sports Facilities. The desired status of this dimension is at a high level, with improvement expectations in all sub-aspects. Among them, Attractiveness of School Sports Activities has the highest modified PNI value, which is the sub-aspect with the strongest improvement demand. The order of modified PNI values from highest to lowest is: Attractiveness of School Sports Activities, Completeness and Usability of Sports Facilities, and Intensity of the Campus Sports Atmosphere.

The Health and Awareness Dimension is at a moderate level. Analysis results show that the sub-aspects of this dimension, ranked by mean values from highest to lowest, are: Effectiveness of Health Management in Promoting Sports, Correlation between Health Awareness and Continuity of Sports, Intensity of Personal Health Awareness, and Awareness of School Health Management. The desired status of this dimension is at a high level, with improvement expectations in all sub-aspects. Among them, Awareness of School Health Management has the highest modified PNI value, which is the sub-aspect with the strongest improvement demand. The order of modified PNI values from highest to lowest is: Awareness of School Health Management, Intensity of Personal Health Awareness, Correlation between Health Awareness and Continuity of Sports, and Effectiveness of Health Management in Promoting Sports.

The Living Habits Dimension is at a relatively favorable level. According to analysis results, the sub-aspects of this dimension, ranked by mean values from highest to lowest, are: Compatibility of Overall Living Habits, Support of Eating Habits for Exercise Performance, and Influence of Regular Work and Rest on Exercise Energy. The desired status of this dimension is at a high level, with improvement expectations in all sub-aspects. Among them, Influence of Regular Work and Rest on Exercise Energy has the highest modified PNI value, which is the sub-aspect with the strongest improvement demand. The order of modified PNI values from highest to lowest is: Influence of Regular Work and Rest on Exercise Energy, Support of Eating Habits for Exercise Performance, and Compatibility of Overall Living Habits.

The Time Management Dimension is at a moderate level. Analysis results indicate that the sub-aspects of this dimension, ranked by mean values from highest to lowest, are: Matching of Time Management Ability with Exercise Needs, Extrusion of Exercise Time by Daily Time Allocation, and Exercise Experience under the Existing Time Pattern. The desired status of this dimension is at a high level, with improvement expectations in all sub-aspects. Among them, Exercise Experience under the Existing Time Pattern has the highest modified PNI value, which is the sub-aspect with the strongest improvement demand. The order of modified PNI values

from highest to lowest is: Exercise Experience under the Existing Time Pattern, Matching of Time Management Ability with Exercise Needs, and Extrusion of Exercise Time by Daily Time Allocation.

The Incentive and Club Dimension is at a relatively low level. According to analysis results, the sub-aspects of this dimension, ranked by mean values from highest to lowest, are: Improvement of Sports Skills through Club Training, Increase in Exercise Frequency by Club Activities, Recognition of the Fairness of Incentive Standards, Incentive Effect of the Sports Incentive Mechanism, and Sense of Gain from Participating in Club Activities. The desired status of this dimension is at a high level, with improvement expectations in all sub-aspects. Among them, Sense of Gain from Participating in Club Activities has the highest modified PNI value, which is the sub-aspect with the strongest improvement demand. The order of modified PNI values from highest to lowest is: Sense of Gain from Participating in Club Activities, Incentive Effect of the Sports Incentive Mechanism, Recognition of the Fairness of Incentive Standards, Increase in Exercise Frequency by Club Activities, and Improvement of Sports Skills through Club Training.

The Psychology and Stress Dimension is at a relatively favorable level. Analysis results show that the sub-aspects of this dimension, ranked by mean values from highest to lowest, are: Effectiveness of Exercise as a Stress-Relief Method, Facilitation of Sports by Mental Health Status, and Obstruction of Exercise Willingness by Stress Level. The desired status of this dimension is at a high level, with improvement expectations in all sub-aspects. Among them, Facilitation of Sports by Mental Health Status has the highest modified PNI value, which is the sub-aspect with the strongest improvement demand. The order of modified PNI values from highest to lowest is: Facilitation of Sports by Mental Health Status, Effectiveness of Exercise as a Stress-Relief Method, and Obstruction of Exercise Willingness by Stress Level.

The Family Influence Dimension is at a moderate level. According to analysis results, the sub-aspects of this dimension, ranked by mean values from highest to lowest, are: Comprehensive Influence of Family Factors on Sports, Guiding Role of

Family Health Concepts, and Degree of Family Support for Sports. The desired status of this dimension is at a high level, with improvement expectations in all sub-aspects. Among them, Degree of Family Support for Sports has the highest modified PNI value, which is the sub-aspect with the strongest improvement demand. The order of modified PNI values from highest to lowest is: Degree of Family Support for Sports, Guiding Role of Family Health Concepts, and Comprehensive Influence of Family Factors on Sports.

Supporting Factors

1. Through interviews with physical education teachers, educational administrators, and analysis of questionnaire data, the supporting factors for enhancing sustainable sports participation of undergraduate students were summarized as follows:

1) Institutional support: Reasonable arrangement of health education courses, sound sports incentive mechanisms, and policy support for campus sports activities.

2) Resource guarantee: Availability of sports facilities, qualified physical education teachers, and extracurricular health knowledge resources.

3) Environmental driving: Positive campus sports culture, family support for sports, and social emphasis on physical health.

4) Individual motivation: Students' awareness of the connection between health and sports, and the demand for improving sports skills and physical fitness.

5) Technological empowerment: Application of online education platforms, health management apps, and time-management tools.

2. The factors influencing sustainable sports participation of undergraduate students

In line with the first research objective, factors influencing undergraduate students' sustainable sports participation primarily involve eight dimensions: Educational and Knowledge, Campus Environment, Health and Awareness, Living Habits, Time Management, Incentive and Club, Psychology and Stress, and Family Influence. Statistical analysis of questionnaire data indicates that factors influencing

undergraduate students' sustainable sports participation are generally at a high importance level. Based on the mean values of the eight dimensions, all influencing factors are at a high level. Among the factors affecting their sustainable sports participation, surveyed students regard the Incentive and Club Dimension as the most important, followed by the Educational and Knowledge Dimension, with the Family Influence Dimension ranking third.

The Incentive and Club Dimension is at a high importance level. Analysis results show that the order of importance from highest to lowest is as follows: "Sense of Gain from Participating in Club Activities" (first), "Incentive Effect of the Sports Incentive Mechanism" (second), "Recognition of the Fairness of Incentive Standards" (third), "Increase in Exercise Frequency by Club Activities" (fourth), and "Improvement of Sports Skills through Club Training" (fifth).

The Educational and Knowledge Dimension is at a high importance level. According to analysis results, the order of importance from highest to lowest is: "Enthusiasm for Participation Stimulated by Teaching Methods" (first), "Practicality of Knowledge and Skill Improvement in Courses" (second), "Helpfulness of Obtaining Health Knowledge Outside Class" (third), and "Rationality of the Arrangement of School Health Education Courses" (fourth).

The Family Influence Dimension is at a high importance level. Analysis results indicate that the order of importance from highest to lowest is: "Degree of Family Support for Sports" (first), "Guiding Role of Family Health Concepts" (second), and "Comprehensive Influence of Family Factors on Sports" (third).

The Time Management Dimension is at a high importance level. According to analysis results, the order of importance from highest to lowest is: "Exercise Experience under the Existing Time Pattern" (first), "Matching of Time Management Ability with Exercise Needs" (second), and "Extrusion of Exercise Time by Daily Time Allocation" (third).

The Health and Awareness Dimension is at a high importance level. Analysis results show that the order of importance from highest to lowest is: "Awareness of School Health Management" (first), "Intensity of Personal Health Awareness" (second),

"Correlation between Health Awareness and Continuity of Sports" (third), and "Effectiveness of Health Management in Promoting Sports" (fourth).

The Living Habits Dimension is at a high importance level. According to analysis results, the order of importance from highest to lowest is: "Influence of Regular Work and Rest on Exercise Energy" (first), "Support of Eating Habits for Exercise Performance" (second), and "Compatibility of Overall Living Habits" (third).

The Campus Environment Dimension is at a high importance level. Analysis results indicate that the order of importance from highest to lowest is: "Attractiveness of School Sports Activities" (first), "Completeness and Usability of Sports Facilities" (second), and "Intensity of the Campus Sports Atmosphere" (third).

The Psychology and Stress Dimension is at a high importance level. According to analysis results, the order of importance from highest to lowest is: "Facilitation of Sports by Mental Health Status" (first), "Effectiveness of Exercise as a Stress-Relief Method" (second), and "Obstruction of Exercise Willingness by Stress Level" (third).

Phase 2: Results of development the good health educational management strategies for enhancing sustainable sports participation of undergraduate students.

Based on the questionnaire survey, expert interviews, and focus group discussions, this research selected strategies with a support rate higher than 50% and combined them with the results of SWOT and TOWS matrix analyses. A draft of the good health educational management strategies was proposed, covering 10 core aspects with a total of 86 initial measures. These included 10 measures for innovating the education and knowledge system, 10 measures for optimizing the campus environment, 11 measures for cultivating health awareness, 15 measures for intervening in living habits, 13 measures for improving time management, 12 measures for constructing the incentive and club ecosystem, 10 measures for regulating psychological stress, 14 measures for reconstructing the family support system, 16 measures for establishing a dynamic risk management system, and 20 measures for building a stakeholder collaborative mechanism.

The final good health educational management strategies for enhancing sustainable sports participation of undergraduate students were refined into 10 aspects with a total of 131 measures. Specifically, there are 10 measures for innovating the education and knowledge system, 10 measures for optimizing the campus environment, 11 measures for cultivating health awareness, 15 measures for intervening in living habits, 13 measures for improving time management, 12 measures for constructing the incentive and club ecosystem, 10 measures for regulating psychological stress, 14 measures for reconstructing the family support system, 16 measures for establishing a dynamic risk management system, and 20 measures for building a stakeholder collaborative mechanism.

Innovating the Education and Knowledge System consisted of 10 measures: 1) Reconstruct the curriculum system (integrate health and sports knowledge to enhance practicality); 2) Innovate the teaching mode (use digital tools and interactive methods); 3) Optimize the evaluation system (incorporate health literacy and sports participation into indicators); 4) Integrate educational resources (break disciplinary boundaries); 5) Strengthen digital empowerment (provide personalized learning resources via online platforms); 6) Deepen teacher training (improve professional capabilities in health and sports education); 7) Promote policy alignment (align school sports policies with national health strategies); 8) Strengthen international integration (introduce advanced concepts); 9) Establish a feedback mechanism (collect opinions from students and teachers); 10) Cultivate an innovative ecosystem (encourage innovative practices in sports education).

Optimizing the Campus Environment consisted of 10 measures: 1) Optimize campus spatial layout (rationally plan sports venues); 2) Cultivate a sports culture atmosphere (organize diverse sports activities); 3) Enhance facility accessibility (ensure convenient use of sports facilities); 4) Promote the club ecosystem (support the development of sports clubs); 5) Strengthen digital integration (improve management via digital technology); 6) Establish a feedback mechanism (collect needs for the sports environment); 7) Launch green campus initiatives (create an environmentally friendly sports environment); 8) Create inclusive spaces (meet the needs of different

student groups); 9) Implement time slot management (arrange sports courses and activities reasonably); 10) Build a policy support framework (formulate systems conducive to campus sports).

Cultivating Health Awareness consisted of 11 measures: 1) Develop interactive health courses (improve health knowledge and self-care abilities); 2) Establish a peer health tutor system (promote knowledge dissemination among students); 3) Carry out health literacy promotion activities (popularize healthy lifestyles); 4) Implement health passports (record health behaviors and sports participation); 5) Establish a health literacy assessment (evaluate health literacy levels regularly); 6) Promote interdisciplinary cooperation (integrate multi-disciplinary resources); 7) Utilize AI health coaches (provide personalized guidance); 8) Establish a health ambassador program (select student ambassadors to drive participation); 9) Integrate health into academic courses (infuse health concepts into teaching); 10) Formulate health literacy standards (clarify development goals); 11) Conduct health impact assessments (evaluate the effect of sports and health interventions).

Intervening in Living Habits consisted of 15 measures: 1) Develop personalized habit plans (formulate exercise and living plans based on individual differences); 2) Implement a habit-tracking system (track habits and exercise via digital technology); 3) Create a supportive environment (foster an atmosphere encouraging healthy living); 4) Cultivate a sense of social responsibility (organize sports public welfare activities); 5) Gamify habit formation (design interesting challenges to motivate habits); 6) Integrate health into academic curricula (cultivate healthy lifestyles in teaching); 7) Utilize digital platforms (develop health management apps); 8) Establish health contracts (sign commitments with parents/teachers); 9) Hold time management workshops (improve time arrangement for exercise); 10) Conduct health audits (evaluate living habits and health conditions); 11) Build community gardens (provide spaces for exercise and labor); 12) Create smoke-free/alcohol-restricted zones (build a healthy campus environment); 13) Create a sleep-friendly environment (strengthen sleep health management); 14) Hold cultural celebration

activities (combine sports with culture); 15) Monitor and adjust strategies (adapt interventions based on health and exercise conditions).

Improving Time Management consisted of 13 measures: 1) Develop intelligent scheduling tools (help plan study and exercise time); 2) Hold time-planning workshops (improve time management skills); 3) Integrate sports into the curriculum (ensure quality and hours of physical education courses); 4) Utilize wearable technology (monitor exercise data in real time); 5) Establish a priority matrix (clarify priorities of study and exercise); 6) Optimize facility opening hours (ensure access during spare time); 7) Create a time management dashboard (visualize time utilization); 8) Implement a staggered class schedule (avoid concentrated exercise time); 9) Develop micro-exercise programs (meet needs during fragmented time); 10) Establish a peer supervision system (encourage mutual supervision); 11) Gamify time allocation (motivate reasonable time arrangement via gamification); 12) Conduct time audits (evaluate time utilization efficiency); 13) Establish industry-university-research cooperation (improve time management for campus sports with external support).

Constructing the Incentive and Club Ecosystem consisted of 12 measures: 1) Implement a tiered reward system (provide rewards based on participation and achievements); 2) Carry out corporate sponsorship programs (attract enterprise support for sports activities); 3) Launch digital badges (issue certifications for outstanding performance); 4) Establish an alumni mentoring network (utilize alumni to guide participation); 5) Create interdisciplinary sports leagues (promote communication across disciplines); 6) Integrate gamification elements (design interesting competitions); 7) Implement peer referral incentives (encourage mutual participation); 8) Formulate a club sustainable development framework (ensure long-term stability of sports clubs); 9) Establish intercollegiate alliances (strengthen sports exchanges between schools); 10) Utilize social media for promotion (enhance activity influence); 11) Create sports ambassador roles (select students to publicize sports culture); 12) Implement club performance evaluations (assess activity effects regularly).

Regulating Psychological Stress consisted of 10 measures: 1) Combine sports with mindfulness practices (cultivate concentration and psychological adjustment abilities); 2) Establish mental health counseling (provide professional psychological services); 3) Hold stress management workshops (teach stress-coping techniques); 4) Utilize AI mental health tools (offer convenient assessments and suggestions); 5) Carry out exercise therapy programs (relieve stress through sports); 6) Cultivate a peer support network (encourage mutual support); 7) Develop a stress-tracking app (monitor stress levels in real time); 8) Integrate sports into academic counseling (relieve study pressure via sports); 9) Set up stress-relief zones (provide relaxation facilities); 10) Implement exercise-based art therapy (combine sports with art for psychological adjustment).

Reconstructing the Family Support System consisted of 14 measures: 1) Establish school-family partnerships (strengthen communication between schools and families); 2) Provide sports scholarships (motivate active participation); 3) Hold family sports workshops (organize parent-student sports activities); 4) Develop a digital family platform (promote information sharing via technology); 5) Sign family sports contracts (clarify family responsibilities for sports); 6) Incorporate family health assessments (include family health in evaluations); 7) Establish family counseling services (provide guidance on sports and health); 8) Form family sports clubs (encourage family participation in sports); 9) Implement an equipment subsidy plan (subsidize sports equipment purchases); 10) Carry out cultural awareness promotion (publicize sports culture); 11) Hold parent training programs (improve parents' sports education abilities); 12) Establish a feedback mechanism (collect family opinions on school sports); 13) Create a Family Sports Day (organize regular family sports activities); 14) Integrate community resources (utilize community facilities for sports).

Establishing a Dynamic Risk Management System consisted of 16 measures: 1) Regularly assess health risks (identify potential physical and mental health risks); 2) Implement a facility safety monitoring mechanism (ensure sports facilities are safe and functional); 3) Establish a risk early warning system (issue timely warnings for sports activities); 4) Update safety knowledge (enhance safety awareness of students

and teachers); 5) Provide risk management training for teachers (improve their risk management capabilities); 6) Formulate emergency response plans (prepare for sports-related accidents); 7) Analyze accident data (summarize lessons from injuries and incidents); 8) Design risk awareness courses (cultivate risk awareness in teaching); 9) Establish risk feedback channels (encourage timely reporting of potential risks); 10) Standardize club management (prevent risks in club activities); 11) Conduct regular safety inspections of venues (ensure facilities meet safety standards); 12) Jointly manage risks with families (establish a school-family communication mechanism); 13) Utilize digital technology for monitoring (improve risk management efficiency); 14) Provide psychological counseling for sports stress (relieve stress to avoid psychological issues); 15) Adjust sports intensity individually (ensure sports suit physical conditions); 16) Evaluate risk management (summarize and improve risk management regularly).

Building a Stakeholder Collaborative Mechanism consisted of 20 measures: 1) Establish biennial stakeholder summits (gather students, teachers, parents, and policymakers); 2) Conduct joint strategic planning (formulate common goals and plans); 3) Implement a stakeholder feedback portal (collect opinions on sports policies); 4) Create cross-sector partnerships (cooperate with sports organizations and medical institutions); 5) Conduct annual needs assessments (clarify key cooperation areas); 6) Establish a shared governance framework (ensure equal participation in decision-making); 7) Formulate a joint funding plan (attract financial support from multiple sources); 8) Carry out cooperative training programs (enhance capabilities of teachers and coaches); 9) Create stakeholder-specific communication channels (e.g., parent newsletters, student forums); 10) Establish intergenerational sports programs (connect alumni and current students); 11) Develop a shared measurement framework (track cooperation outcomes); 12) Hold cultural sensitivity workshops (promote understanding of diverse needs); 13) Create industry-academic cooperation (drive sports technology innovation); 14) Establish joint research projects (address obstacles to sports participation); 15) Build community sports hubs (share facilities and resources); 16) Implement stakeholder recognition awards (motivate participation

in cooperation); 17) Create a digital platform (facilitate networking and resource sharing); 18) Carry out joint advocacy activities (influence national sports policies); 19) Conduct annual cooperation impact assessments (evaluate project effectiveness); 20) Formulate a sustainability charter (ensure long-term commitment to campus sports).

Phase 3: Results of evaluating the feasibility and adaptability of the strategies for enhancing sustainable sports participation of undergraduate students.

According to the evaluation results of the good health educational management strategies for enhancing sustainable sports participation of undergraduate students, the average adaptability of all ten strategies ranged from 4.29 to 4.61, with an overall average of 4.48, at a high to highest level. The average feasibility of these strategies ranged from 4.37 to 4.68, with an overall average of 4.50, also at a high to highest level. This indicated that the good health educational management strategies for enhancing sustainable sports participation of undergraduate students had high feasibility and adaptability.

Discussion

This study focuses on exploring "Good Health Educational Management Strategies for Enhancing Sustainable Sports Participation of Undergraduate Students" and completes three research phases as planned. The following discussion contextualizes the results within existing academic discourse on sports participation and health education management, clarifying alignments with established findings and theoretical connections to prior scholarship.

Phase 1: Results of studying the current situation, expected situation and supporting factors that enhance of sustainable sports participation of undergraduate students.

Phase 2: Results of developing the strategies for enhancing sustainable sports participation of undergraduate students.

Phase 3: Results of evaluating the feasibility and adaptability of the strategies for enhancing sustainable sports participation of undergraduate students.

The details of the research discussion were as follow:

Phase 1: Results of studying the current situation, expected situation and supporting factors that enhance of sustainable sports participation of undergraduate students.

This study investigated the current and expected statuses of undergraduate students' sustainable sports participation across eight dimensions (educational knowledge, campus environment, health awareness, living habits, time management, incentives and clubs, psychology and stress, and family influence) and identified key supporting factors. The findings are as follows:

The current situation of sustainable sports participation among undergraduate students was generally at a moderate level (overall mean = 3.41), with the highest performance in the psychology and stress dimension (mean = 3.66) and the lowest in the incentive and club dimension (mean = 3.05).

The expected situation was at a high level (overall mean = 4.45), with the strongest demand in the incentive and club dimension (mean = 4.60) and the weakest in the psychology and stress dimension (mean = 4.35).

The gap between current and expected states (measured by PNI modified values) was largest in the incentive and club dimension (PNI = 0.53), followed by the educational and knowledge dimension (PNI = 0.46) and family influence dimension (PNI = 0.41), indicating these are priority areas for improvement.

The results of this phase are consistent with and complementary to existing research in the field, as discussed below:

1. Incentive and Club Dimension

This dimension had the largest gap between current and expected states, with key issues including low effectiveness of incentive mechanisms, poor perceived fairness of incentives, and low sense of gain from club activities. This aligns with Zhang Yunhua (2009), who noted that "lack of peer motivation and a weak campus

sports culture" are critical barriers to undergraduate sports participation. Additionally, Smith and Johnson (2002) highlighted that "insufficient organizational support for sports activities" reduces participation willingness, which echoes the finding that club activities in this study failed to effectively motivate students. The strong demand for improved incentives and club experiences in the expected situation further confirms that structured incentive systems and vibrant club ecosystems are core to sustaining sports participation.

2. Educational and Knowledge Dimension

The current situation in this dimension was moderate (mean = 3.11), with notable deficiencies in practical guidance and engaging teaching methods. This is consistent with Zhang Yunhua (2009), who found that "cognitive biases (e.g., viewing sports as a waste of time) reduce students' willingness to participate in sports." The low score for "enthusiasm stimulated by teaching methods" (mean = 2.87) also aligns with Li Hui (2023), who emphasized that "health education must adopt up-to-date, interactive methods" to be effective. The high expected demand for practical knowledge and engaging teaching (mean = 4.48) further supports the view that improving educational content and methods is key to correcting cognitive biases and enhancing participation.

3. Time Management Dimension

The current situation here was moderate (mean = 3.47), with the largest gap in "exercise experience under existing time patterns" (PNI = 0.51). This confirms Smith and Johnson's (2002) finding that "insufficient time management ability leads undergraduates to abandon sports activities." Xu Wenxin (2024) also noted that "academic pressure makes it difficult for students to balance learning and sports," which aligns with this study's result that daily time allocation often squeezes exercise time. The strong expected demand for better time management tools (mean = 4.45) reflects the urgent need for strategies to reconcile academic and sports time.

4. Psychology and Stress Dimension

Although this dimension had the highest current performance (mean = 3.66), a gap remained (PNI = 0.19), with stress still obstructing exercise willingness. This

supports Schultz & Leslie (1988), who found that "mental health problems (e.g., anxiety) reduce sports participation motivation." Notably, this study further found that students recognize exercise as a stress-relief method (mean = 3.70) but struggle to translate this awareness into action-consistent with WHO (2020)'s observation that "sports are underutilized as a mental health intervention despite their proven effectiveness."

5. Family Influence Dimension

The current situation was moderate (mean = 3.17), with low family support for sports (mean = 3.00) and a large gap from expected levels (PNI = 0.41). This aligns with Karada (2018), who stated that "family sports habits and support significantly influence students' sports participation." Sun (2018) also noted that "family attitudes toward sports shape students' long-term participation," which explains why the expected situation emphasized stronger family involvement (mean = 4.44).

6. Campus Environment Dimension

The current situation was relatively good (mean = 3.64) but still lagged behind expectations (PNI = 0.21), with key issues in facility usability and sports activity attractiveness. This is consistent with Xu Wenxin (2024), who identified "insufficient school sports facilities" as a barrier to participation. The high expected demand for improved facilities and atmosphere (mean = 4.41) also supports Yin (2023), who emphasized that "quality facility management and accessibility directly affect participation frequency."

7. Health and Awareness Dimension

The current situation was moderate (mean = 3.55), with low awareness of school health management (mean = 3.18) and a weak link between personal health awareness and continuous sports (PNI = 0.27). This aligns with WHO (2020), which noted that "insufficient health awareness limits the translation of sports knowledge into behavior." The high expected demand for health education (mean = 4.47) further confirms that enhancing health literacy is critical to sustaining sports participation.

8. Living Habits Dimension

The current situation was relatively good (mean = 3.63) but with gaps in the impact of regular work-rest on exercise energy (PNI = 0.23). This supports An (2015), who found that "integrating sports into daily habits improves participation persistence." The expected demand for habit-tracking tools (mean = 4.42) also aligns with Xiang Mingqiang (2013), who highlighted that "internal motivation-driven habits are more sustainable."

The findings of the first research phase are highly consistent with existing research. Such findings confirm that key barriers to undergraduate sustainable sports participation include cognitive biases, time constraints, insufficient incentives, psychological stress, inadequate facilities, and weak family support—all identified in prior studies. Additionally, this study expands on existing literature by systematically analyzing eight interconnected dimensions, revealing that gaps in incentives, education, and time management are the most urgent to address. These results provide an empirical foundation for developing targeted strategies in subsequent research stages.

Phase 2: Results of developing the strategies for enhancing sustainable sports participation of undergraduate students.

The development of good health educational management strategies for enhancing undergraduate students' sustainable sports participation is based on findings from the first research phase (current and expected states of participation) and integrates SWOT-TOWS analysis, expert focus group discussions, and theoretical frameworks (e.g., Self-Determination Theory, Theory of Planned Behavior). The strategies are structured around core components of vision, mission, and goals, with 10 strategic directions and 131 specific measures covering educational systems, campus environments, health awareness, and other relevant aspects. This section discusses the strategies in relation to existing research and their theoretical alignment.

1. Vision

The vision of the strategies is to "foster a positive campus sports culture, make sports a daily habit for undergraduates, and cultivate lifelong exercise awareness." This vision emphasizes three key pillars:

- 1) Building an integrated education system that combines health knowledge, sports skills, and mental health guidance;
- 2) Establishing a diversified collaboration network involving schools, families, communities, and the sports industry;
- 3) Leveraging digital technology (e.g., big data, VR) to enhance the appeal of sports.

This vision aligns with UNESCO (2019)'s advocacy for "inclusive health education that fosters lifelong healthy behaviors" and WHO (2020)'s call to "integrate sports into education frameworks to promote public health." It also responds to China's policy goals (e.g., "Opinions on Comprehensively Strengthening and Improving School Sports Work in the New Era" (2021)), which emphasize building a "modern high-quality school sports system" by 2035. By positioning sports as a lifelong habit rather than a short-term activity, the vision addresses Zhang Yunhua (2009)'s observation that "cognitive biases (e.g., viewing sports as a waste of time) hinder long-term participation" — a core barrier identified in the first research phase.

2. Mission

The mission translates the vision into actionable tasks, focusing on seven key responsibilities:

- 1) Providing high-quality physical education with student-centered courses and professional skill training;
- 2) Optimizing sports resource allocation to improve facility accessibility and usability;
- 3) Cultivating health awareness and habits through education and lifestyle interventions;
- 4) Supporting sports clubs to enhance their attractiveness and sustainability;

- 5) Facilitating collaboration among stakeholders (including schools, families, enterprises);
- 6) Conducting research and evaluation to refine strategies;
- 7) Disseminating sports culture to foster teamwork and resilience.

This mission is consistent with existing research on effective sports education management. For instance, the focus on "optimizing resource allocation" responds to Xu Wenxin (2024)'s finding that "insufficient sports facilities" are a key barrier to participation. The emphasis on "stakeholder collaboration" aligns with Karada (2018)'s conclusion that "family and community support significantly influence students' long-term sports engagement." Additionally, the mission integrates "research and evaluation" to address Peter (2011)'s recommendation that "health education strategies require regular adjustment based on data and feedback" — ensuring strategies remain adaptive to students' needs.

3. Goals

The strategies set measurable goals to track progress toward the mission, including:

- 1) Increasing the proportion of students who regularly participate in sports by 15% within one academic year;
- 2) Improving students' average health literacy score by 10% within two semesters;
- 3) Reducing health issues caused by poor habits (e.g., obesity, anxiety) by 12% within one year;
- 4) Achieving 80% student satisfaction with campus sports facilities by the end of the academic year;
- 5) Developing 3 interdisciplinary sports programs within two years;
- 6) Establishing partnerships with 2 external sports organizations within one year;
- 7) Increasing sports club membership by 20% within one academic year.

These goals are rooted in Phase 1's findings. For instance, the goal to "increase regular participation" directly addresses the low current participation rate

(moderate level, mean = 3.41), while "improving health literacy" targets the gap in health awareness (PNI = 0.27). They also align with WHO (2020)'s evidence that "increasing sports participation reduces non-communicable diseases" and Sun (2018)'s emphasis on "family and community involvement in sustaining sports habits."

4. Key Strategies and Alignment with Existing Research

The 10 strategic directions (e.g., innovating education systems, optimizing campus environments) were developed to address the eight-dimensional gaps identified in the first research phase. Below is a discussion of core strategies and their consistency with existing literature:

4.1 Strategies for Innovation of Education and Knowledge System

This strategy, which focuses on reconstructing curricula, innovating teaching methods, and strengthening digital empowerment—such as developing online sports courses and using AI for personalized guidance—directly addresses the finding from Phase 1 that "teaching methods fail to stimulate participation enthusiasm". Close alignment exists with relevant research conclusions: Li Hui (2023) emphasized that "health education must adopt up-to-date, interactive methods" to engage students, and this strategy's emphasis on innovative teaching methods and digital tools precisely responds to this view; Du Huimin (2021) noted that "digital tools (e.g., interactive modules) are critical for adapting health education to the digital age," which receives echo from the strategy's focus on digital empowerment. Additionally, the inclusion of "international integration" measures, such as introducing global sports education models, also supports Girginov (2008)'s recommendation to "learn from advanced foreign experience to cultivate sports professionals," thus making the strategy both targeted at existing problems and theoretically grounded in multiple research perspectives.

4.2 Strategies for Optimization of Campus Environment

This strategy, which aims to improve facility accessibility, cultivate a sports culture, and integrate digital technology (such as smart venue booking systems), directly addresses the gap identified in Phase 1 regarding "facility usability". Consistency exists with relevant viewpoints: Yin (2023) found that "good facility

management and accessibility increase participation frequency," and the strategy's emphasis on improving facility accessibility responds exactly to this; Xu (2009) noted that "community sports resources complement school facilities, especially for resource-poor schools," which aligns with the direction of optimizing campus sports resources through the strategy. Moreover, the focus on "inclusive spaces" (for example, facilities for students with disabilities) also echoes UNESCO (2019)'s advocacy for "inclusive health education that meets all students' needs," thus making the strategy not only targeted at addressing existing facility-related issues but also reflecting a people-oriented and inclusive educational concept.

4.3 Strategies for Construction of Incentive and Club Ecosystem

This strategy, which emphasizes tiered reward systems, corporate sponsorships, and interdisciplinary sports leagues, directly targets the largest gap identified in the first research phase—the incentive and club dimension with a PNI of 0.53. Consistency exists with relevant research views: Pialkien (2019) stated that "incentive measures stimulate students' internal motivation for sports," and the tiered reward systems in this strategy precisely play such a role; Zhang Yunhua (2009) highlighted that "peer motivation and a strong campus sports culture enhance participation persistence," which receives echo from the interdisciplinary sports leagues in the strategy that can foster a positive sports culture and peer motivation. Additionally, the use of "digital badges" and "gamification" in the strategy supports the finding that "technology increases engagement" (Ren Fei, 2020) and effectively addresses the issue of low sense of gain from club activities in the first research phase, thus rendering the strategy both targeted and practical.

4.4 Strategies for Reconstruction of Family Support System

This strategy, which promotes school-family partnerships, family sports workshops, and equipment subsidies, directly addresses the gap in family support with a PNI of 0.41 as identified in the research. Consistency exists with relevant findings: Karada (2018) found that "family sports interactions (e.g., parent-child games) enhance students' participation willingness," and the family sports workshops in this strategy create opportunities for such interactions; Sun (2018) noted that "family

attitudes toward sports shape students' long-term participation habits," and the school-family partnerships in the strategy can help guide and optimize family attitudes toward sports. By integrating families into sports promotion, this strategy not only targets the issue that "family support for sports is currently low" (with a mean of 3.00) found in Phase 1 but also forms a complementary relationship with school-based sports promotion efforts, thus building a more comprehensive support system for undergraduate students' sustainable sports participation.

4.5 Strategies for Regulation of Psychological Stress

This strategy, which combines sports with mindfulness, provides mental health counseling, and develops stress-tracking apps, directly addresses the gap where "stress obstructing exercise willingness" (with a PNI of 0.19) as identified. Consistency exists with relevant research conclusions: Schultz (1988) found that "anxiety and depression reduce sports motivation," and the mental health counseling and stress-tracking apps in this strategy can help alleviate such negative emotions and their impact; Guo (2020) confirmed that "physical activity alleviates stress by boosting endorphins," which receives echo from the combination of sports and mindfulness in the strategy that leverages the stress-relief effect of physical activity. Additionally, response is made by the strategy to the finding from Phase 1 that although students recognize exercise as a stress-relief tool (with a mean of 3.70), difficulty exists in acting on it - by offering structured interventions such as sports therapy programs, bridging is achieved for the gap between awareness and action, rendering the strategy both targeted and practical.

The developed strategies are rooted in empirical findings (the first research phase) and theoretical frameworks, with strong consistency with existing research. They address key barriers identified in literature - such as insufficient incentives (Zhang Yunhua, 2009), facility limitations (Xu Wenxin, 2024), and psychological barriers (Schultz, 1988) - while incorporating innovative elements (e.g., digital technology, interdisciplinary collaboration) to adapt to modern educational environments. By integrating vision, mission, and measurable goals, the strategies

provide a systematic solution to enhance sustainable sports participation, laying the groundwork for feasibility evaluation in the third research phase.

Phase 3: Results of evaluating the feasibility and adaptability of the strategies for enhancing sustainable sports participation of undergraduate students.

The evaluation of the good health educational management strategies was conducted by 5 experts using a five-level scoring system (highest, high, average, low, lowest) to assess feasibility and adaptability. The results showed that the overall adaptability of the 10 strategies reached a high to highest level (overall mean = 4.48), and the overall feasibility reached the highest level (overall mean = 4.50). This indicates that the strategies were formulated through a scientific process—integrating Phase 1's empirical findings, Phase 2's theoretical alignment, and expert insights—and are suitable for practical implementation in educational settings.

1. Adaptability of the Strategies

Adaptability refers to the degree to which strategies match the actual needs of undergraduate students, campus environments, and educational goals. The evaluation results showed that:

1) Highest adaptability: Strategies for the collaborative mechanism of stakeholders, improvement of time management, and establishment of dynamic risk management scored highest. These strategies align with the complex needs of contemporary undergraduates, such as balancing academic pressure and sports (Xu Wenxin, 2024) and ensuring safety in sports participation (Yin, 2023).

2) High adaptability: Strategies for innovation of education and knowledge systems, optimization of campus environments, and cultivation of health awareness also performed well. They respond to the demand for updated teaching methods (Li Hui, 2023) and improved facility accessibility (Xu, 2009), which were identified as key gaps in the first research phase.

The high adaptability of the strategies is attributed to their grounding in actual needs: for example, time management strategies (e.g., smart scheduling tools)

directly address "exercise time extrusion by academic tasks", while family support strategies (e.g., parent-child sports workshops) target "low family support for sports".

2. Feasibility of the Strategies

Feasibility refers to the practicality of implementing the strategies, considering resource availability, policy support, and operational conditions. The evaluation results showed that:

1) Highest feasibility: All 10 strategies achieved a highest level of feasibility, with the improvement of time management and construction of incentive and club ecosystems scoring particularly high. This is because time management strategies rely on existing digital tools (e.g., wearable devices) and adjustable schedules, while incentive strategies can leverage corporate sponsorships and campus clubs—resources that are increasingly accessible (PNI modified value for incentive and club dimension = 0.53 in the first research phase).

2) Policy and resource support: The feasibility of strategies is further supported by national policies (e.g., "Opinions on Comprehensively Strengthening and Improving School Sports Work in the New Era" (2021)), which emphasize sports facility investment and campus sports culture. This aligns with expert evaluations that "policy support frameworks" (Strategy 2) provide a solid foundation for implementation.

Notably, even strategies involving multiple stakeholders (e.g., collaborative mechanism of stakeholders) scored high in feasibility, as they build on existing partnerships between schools and communities—consistent with WHO (2020)'s recommendation to "integrate community resources into youth sports promotion."

3. Alignment with Vision, Mission, and Goals

The high feasibility and adaptability of the strategies are closely linked to their alignment with the vision, mission, and goals formulated in the second research phase:

1) Vision: The goal of "making sports a daily habit" is supported by strategies like living habit intervention (mean = 4.44 in adaptability), which are feasible to implement through digital tracking tools (Ren Fei, 2020).

2) Mission: "Optimizing sports resource allocation" is achievable through campus environment strategies (mean = 4.37 in feasibility), which focus on low-cost facility upgrades (e.g., extending opening hours).

3) Goals: Specific targets such as "increasing regular participation by 15%" are supported by incentive strategies (mean = 4.56 in feasibility), which use tiered rewards to motivate students-consistent with Pialkien (2019)'s finding that "incentives enhance participation persistence."

The evaluation results confirm that the strategies are both adaptable to undergraduate students' needs and feasible to implement. Their high scores stem from: (1) grounding in empirical gaps identified in earlier research (e.g., incentive shortages, time constraints); (2) alignment with existing policies and research (e.g., WHO's sports promotion guidelines); and (3) reliance on accessible resources (e.g., digital tools, corporate partnerships). These strategies can effectively support the vision of lifelong sports habits and the mission of holistic student development, laying a practical foundation for enhancing sustainable sports participation.

Summary

This study's findings align with the United Nations Sustainable Development Goal 3 (SDG 3: Good Health and Well-being), which emphasizes physical, mental, and social well-being. The results from the present research directly correspond to these three dimensions, as elaborated below:

1. Alignment with Physical Wellbeing

Physical wellbeing, focused on physiological health and physical activity, is strongly reflected in the analysis of the Campus Environment, Living Habits, and Health Awareness dimensions.

1) Campus Environment: The current situation of this dimension (mean = 3.64, S.D. = 0.61) highlights the role of sports facilities and activity attractiveness in supporting physical activity. Strategies for optimizing the campus environment (e.g.,

improving facility accessibility, cultivating a sports culture) scored a feasibility mean of 4.37, indicating practicality in enhancing opportunities for physical exercise—directly contributing to students' physical health.

2) Living Habits: With a current mean of 3.63 (S.D. = 0.64), this dimension emphasizes the impact of regular work-rest and eating habits on exercise energy. Intervention strategies (e.g., personalized habit plans, sleep-friendly environments) achieved a feasibility mean of 4.39, demonstrating effectiveness in fostering healthy behaviors that underpin physical wellbeing.

3) Health Awareness: The current mean of 3.55 (S.D. = 0.68) reflects moderate awareness of health-sports connections. Strategies such as AI health coaches and health passports (feasibility mean = 4.44) strengthen students' ability to manage physical health, aligning with SDG 3's goal of promoting healthy lifestyles.

2. Alignment with Mental Wellbeing

Mental wellbeing, focusing on psychological resilience and stress management, is supported by the Psychology and Stress dimension and related strategies.

1) The current situation of the Psychology and Stress dimension confirms that students recognize exercise as a stress-relief tool (mean = 3.70) but face barriers in translating this awareness into action.

2) Strategies for regulating psychological stress (e.g., mindfulness-sports integration, mental health counseling) achieved a feasibility mean of 4.51, with specific measures like stress management workshops and AI mental health tools scoring high adaptability. These strategies directly address SDG 3's emphasis on mental health by enhancing students' ability to cope with stress through sports, thereby improving psychological wellbeing.

3. Alignment with Social Wellbeing

Social wellbeing, rooted in social support and community engagement, is evident in the Family Influence, Incentive and Club Ecosystem, and Stakeholder Collaborative Mechanism dimensions.

1) Family Influence: With a current mean of 3.17 (S.D. =0.86), this dimension highlights the need for stronger family support. Strategies such as family sports workshops and school-family partnerships (feasibility mean = 4.54) strengthen familial engagement in sports, fostering social connections that underpin wellbeing.

2) Incentive and Club Ecosystem: Despite a low current mean (3.05, S.D. = 0.71), strategies like interdisciplinary sports leagues and tiered reward systems (feasibility mean = 4.56) promote peer interaction and teamwork, enhancing social cohesion.

3) Stakeholder Collaboration: Strategies involving schools, families, communities, and enterprises (feasibility mean = 4.57) create a collaborative network for sports participation. Measures such as biennial stakeholder summits and community sports hubs align with SDG 3's focus on collective responsibility for health, strengthening social support systems.

In summary, this study's findings and strategies directly respond to SDG 3 by addressing physical, mental, and social wellbeing through data-driven interventions. The high feasibility and adaptability of these strategies confirm their potential to advance sustainable sports participation and contribute to holistic health outcomes for undergraduate students.

Recommendation

General recommendation

To align with SDG 3 (Good Health and Well-being) and build on the 10 strategies developed in Chapter 4, the following targeted recommendations are proposed to enhance undergraduate students' sustainable sports participation across physical, mental, and social well-being:

1. Promoting Physical Wellbeing

Leveraging strategies for campus environment optimization and living habits intervention, which demonstrated high feasibility, the following actions are recommended:

1) Policy-level: Allocate dedicated funds to upgrade sports facilities (e.g., expanding accessible venues, updating equipment) and integrate green campus initiatives (e.g., eco-friendly sports spaces) to encourage daily physical activity. This responds to the identified demand for improved facility usability.

2) Practical-level: Scale up personalized habit-tracking programs using digital tools (e.g., health management apps) to monitor students' exercise, sleep, and diet. Pair these tools with tailored guidance (e.g., exercise plans for irregular schedules) to strengthen the link between living habits and physical health—consistent with the high adaptability of habit intervention strategies.

2. Enhancing Mental Wellbeing

Building on the psychological stress regulation strategies, which include mental health counseling and stress-management workshops, the following steps are critical:

1) Institutional integration: Embed sports-based mental health programs into university counseling services. For example, offer mindfulness sports workshops and exercise therapy sessions (e.g., yoga, group running) as formal mental health interventions, leveraging the proven stress-relief effect of physical activity.

2) Training for educators: Equip physical education teachers and counselors with skills to identify stress-related barriers to sports participation and design targeted interventions (e.g., stress-tracking apps paired with exercise recommendations), aligning with the high adaptability of AI mental health tools.

3. Strengthening Social Wellbeing

Drawing on family support system and stakeholder collaboration strategies, focus on:

1) Family engagement: Expand family sports workshops and establish annual “Family Sports Days” to strengthen parent-student interaction in physical activity, addressing the high demand for family support. Provide equipment subsidies for low-income families to reduce participation barriers.

2) Multi-stakeholder networks: Formalize partnerships between universities, local communities, and enterprises to share sports resources (e.g., opening campus facilities to communities, hosting intercollegiate leagues). Implement

the proposed biennial stakeholder summits to align goals across sectors, enhancing social cohesion around student sports participation.

By operationalizing these recommendations, universities can effectively advance SDG 3, fostering holistic health outcomes through sustainable sports participation. The strategies' proven feasibility and adaptability ensure these actions are practical and scalable, contributing to long-term improvements in students' physical, mental, and social well-being.

Suggestions for further research

1. Conducting research on comparative studies across different types of undergraduates (such as liberal arts undergraduates, science and technology undergraduates, and vocational undergraduates) or internationally. Implementation of longitudinal research to track the long-term impact of these strategies on students' sports participation habits, health conditions, and overall well-being. Such studies will help identify best practices, differences in implementation effects among different types of undergraduates, and long-term trends in promoting students' sports participation.

2. Investigating the influence of cultural factors on students' sports participation motivation and behavior. Exploration of the role of emerging technologies, such as virtual reality in sports training and artificial intelligence in personalized sports guidance, in enhancing students' sports participation experience and effectiveness. This research will provide insights into how cultural values and modern technologies can support the sustainable development of students' sports participation.

3. Examining the relationship between students' mental health and their sports participation levels. Studying students' perceptions of the strategies implemented among undergraduates and analyzing the impact of national and local educational policies on promoting sports participation. Such research topics will help inform strategies for better integrating sports with mental health promotion, refining undergraduate-level strategies based on students' feedback, and influencing educational policies to better support students' sustainable sports participation.

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Appendices

Appendix A

List of Specialists and Letters of Specialists Invitation
for IOC Verification

List of Specialists Invitation for IOC Verification

Name of Experts	Position/Office
1. Associate Professor Dr. Chollada Pongpattanayothin	Ph.D. Education for Locality Development Bansomdejchaopraya Rajabhat University
2. Associate Professor Dr. areewan iamsaard	Ph.D. Curriculum and Instruction Kasetsart University
3. Associate Professor Dr. Jittawisut Wimuttipanya	Ph.D. Curriculum and Instruction Bansomdejchaopraya Rajabhat University
4. Professor Tang yan	Doctor of Education Vice President of Shanghai University of Sport
5. Professor Liu Xinmin	Doctor of Education Vice President of Xi'an Physical Education University

List of Experts Invitation for Strategies Evaluation

The following lists were invited as an evaluation expert to evaluate the adaptability and feasibility of strategies on good health educational management for enhancing sustainable sports participation of undergraduate students.

Name	Position
1. Associate Professor Dr. Aareewan iamsaard	Ph.D. Curriculum and Instruction Kasetsart University
2. Associate Professor Dr. Jittawisut Wimuttipanya	Ph.D. Curriculum and Instruction of Valaya Alongkorn Rajabhat University
3. Associate Professor Dr. Narongwat Mingmit	Ph.D. Education for locality Development of Bansomdejchaopraya Rajabhat University
4. Professor Wan Bingjun	Dean and Doctoral Supervisor of the School of Physical Education, Shaanxi Normal University
5. Professor Yang Jianshe	Doctor of Education Dean of the School of Sports and Leisure

List of Experts for Interview

Name of Experts	Position/Office
1. Professor Liu Yang	Director of the Department of Physical Education, Shenzhen University of Technology
2. Professor Dr. Zhang Peng	Doctor of Social Sports, Deputy Dean of the School of Physical Education, Honghe undergraduate
3. Professor Dr. Zheng Xiaofeng	Doctor of Social Sports, Honghe undergraduate
4. Professor Dr. Dai Jianhui	Doctor of Education, Soochow University
5. Professor Dr. Li Long	Doctor of Education, Deputy Dean of the School of Physical Education, Soochow University
6. Professor Dr. Tao Yuliu	Doctor of Education, Dean of the School of Physical Education, Soochow University
7. Professor Zhang Xiqian	Dean of the School of Physical Education, Tarim University
8. Professor Li Xiaotang	Director of the Physical Education Teaching and Research Department, Lanzhou University of Technology
9. Professor Wu Xiaoming	Dean and Secretary of the Party Committee of the School of Physical Education, Shihezi University
10. Professor Zhu Meixin	Deputy Secretary of the Party Committee of the School of Physical Education, Shihezi University
11. Professor Dr. Guo Zhaoxia	Doctor of Sports Humanistic Sociology, Taiyuan University of Technology

Name of Experts	Position/Office
12. Associate Professor Dr. Ma Huijun	Doctor of School Physical Education,Taiyuan University of Technology
13. Professor Dr. Zou Benxu	Doctor of Management, Dean of the School of Social Sports, Shenyang Sport University
14.Professor Dr. Cui Luxiang	Doctor of Education,Vice President of Shenyang Sport University, Shenyang Sport University
15.Professor Dr. Cao Jihong	Doctor of Education, Dean of the School of Social Sports,Shaanxi University of Chinese Medicine
16.Professor Sun Xuehong	Director of the Teaching and Research Office, Shaanxi University of Chinese Medicine

List of Experts for Focus Group Discussion

Name of Experts	Position/Office
1. Professor Yang Haihang	Dean of the School of Physical Education, Tibet Minzu University
2. Professor Chen Pengsheng	Dean of the School of Physical Education, Xianyang Normal University
3. Professor Dr. Yang Jianshe	Doctor of Social Sports, Dean of the School of Sports and Leisure, Xi'an Physical Education University
4. Professor Dr. Wang Peng	Doctor of Management, Dean of the School of Sports Economics and Management, Xi'an Physical Education University
5. Professor Dr. Liu Yang	Doctor of Physical Education and Training, Shaanxi Normal University
6. Professor Zhong Quanhong	Dean of the School of Physical Education, Northwest Normal University
7. Professor Dr. Zhang Bing	Doctor of Educational Management, Dean of the School of Physical Education, Yancheng Teachers University
8. Professor Zhang Xu	Director of the Physical Education Teaching and Research Department, Northwest University
9. Professor Shangguan Fuzhong	Director of the Physical Education Teaching and Research Section, Jiangsu Ocean University
9. Professor Shangguan Fuzhong	Director of the Physical Education Teaching and Research Section, Jiangsu Ocean University
10. Professor Dr. Wen Bo	Doctor of Physical Education and Training, Dean of the School of Physical

Name of Experts	Position/Office
11. Professor Dr. Li Qidi	Education, Hanshan Normal University. Doctor of School Physical Education and Sports Sociology, Dean of the undergraduate of Physical Education and Health Sciences, Zhejiang Normal University.
12 .Professor Wang Juhai	Dean of the School of Physical Education, Weinan Normal University

Appendix B

Official Letter



Ref.No. MHESI 0643.14/2.50

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

February 2025

Subject Invitation to validate research instrument

Dear

Attachment A set of research instrument

Yang Xiaodan is a graduate student in the Doctor of Philosophy Program in Education Management for Sustainable Development of Bansomdejchaopraya Rajabhat University. She is undertaking research entitle "Good Health Educational Management Strategies forEnhancing Sustainable Sports Participation of Undergraduate Students"

A dissertation adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research instrument.

With your expertise, we would like to ask your permission to validate the attached research instrument. Would like to avail ourselves of this opportunity to express our sincere thanks and appreciation for your help.

Thank you for considering this invitation. We look forward to your kind support.

Yours faithfully

(Asst. Prof. Dr.Tanaput Chanchaen)

Vice Dean of Graduate School for Dean of Graduate School

Tel.+662-473-7000

www.bsru.ac.th

E-mail: academic_grad@bsru.ac.th



Ref.No. MHESI 0643.14/ก. 115

Bansomdejchaopraya Rajabhat University

1061 Itsaraparb Hirunrujee

Thonburi Bangkok 10600

15 May 2025

Subject Invitation to join a Strategies Evaluation as an expert

Dear

Attachment A Strategies Evaluation Form

Mrs.Yang Xiaodan is a Doctor of Philosophy program in Education Management for Sustainable Development of Bansomdejchaopraya Rajabhat University. She is undertaking research entitle "Good Health Educational Management Strategies for Enhancing Sustainable Sports Participation of undergraduate Students"

The thesis advisory committee, along with the student, recognizes your expertise in this field. As such, the graduate school would like to formally invite you to join a Strategies Evaluation as an expert, where your insights and suggestions will greatly contribute to the advancement of the student's research.

Thank you for considering this invitation.

Yours faithfully

(Asst. Prof. Dr.Tanaput Chanchaoren)

Vice Dean of Graduate School for Dean of Graduate School

Tel.+662-473-7000

www.bsru.ac.th

G-mail: academic.grad@bsru.ac.th



Ref.No. MHESI 0643.14/1.31

Bansorndejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

1 April 2025

Subject Invitation to join an interview as an expert

Dear

Attachment Interview Form

Yang Xiaodan is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansorndejchaopraya Rajabhat University. She is conducting research entitled "Good Health Educational Management Strategies for Enhancing Sustainable Sports Participation of Undergraduate Students".

The dissertation advisory committee, along with the student, recognizes your expertise in this field. As such, the graduate school would like to formally invite you to participate in Interview as an expert, where your insights and suggestions will greatly contribute to the advancement of the student's research.

Thank you for considering this invitation. We look forward to your kind support.

Yours faithfully

(Asst. Prof. Dr. Tanaput Chanchaen)

Vice Dean of Graduate School for Dean of Graduate School

Tel. +662-473-7000

www.bsru.ac.th

E-mail: academic.grad@bsru.ac.th



Ref.No. MHESI 0643.14/1.32

Bansomdejchaopraya Rajabhat University

1061 Itsaraparb Hirunrujee

Thonburi Bangkok 10600

1 April 2025

Subject Invitation to join a focus group discussion as an expert

Dear

Attachment A focus group discussion schedule

Yang Xiaodan is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. She is conducting research entitled "Good Health Educational Management Strategies for Enhancing Sustainable Sports Participation of Undergraduate Students".

The dissertation advisory committee, along with the student, recognizes your expertise in this field. As such, the graduate school would like to formally invite you to join a focus group discussion as an expert, where your insights and suggestions will greatly contribute to the advancement of the student's research.

Thank you for considering this invitation. We look forward to your kind support.

Yours faithfully

(Asst. Prof. Dr. Tanaput Chanchaen)

Vice Dean of Graduate School for Dean of Graduate School

Tel. +662-473-7000

www.bsru.ac.th

E-mail: academic.grad@bsru.ac.th

Appendix C

Research Instrument



陕西科技大学镐京学院

HAQJING COLLEGE SHAANXI UNIVERSITY OF SCIENCE & TECHNOLOGY

Questionnaire

Good Health Educational Management Strategies for Enhancing Sustainable Sports Participation of Undergraduate Students

Direction:

1.This questionnaire aims to understand the current situation and desirable situation of how good health education management strategies enhance undergraduate students' continuous participation in sports and the factors contributing to its development. The objectives of this study are to explore the components of good health education management strategies for promoting undergraduate students' continuous sports participation, formulate such strategies, and evaluate them.

2.This questionnaire on undergraduate students' sports participation is divided into two parts. The first part is the personal information of the respondents, including the school they attend, grade, major, etc. The second part is the survey on the promotion of undergraduate students' continuous sports participation by good health education management strategies. There are 25 questions in total, covering aspects such as health education courses, the creation of a campus sports atmosphere, health management measures, time management, sports incentive mechanisms, sports clubs, and family influence. For example, it asks about the impact of the content, frequency, and teaching methods of health education courses on undergraduate students' sports participation, the convenience of campus sports facilities and expectations for improvement, the awareness and views on health management measures, the impact of daily time allocation on sports participation, the effectiveness of sports incentive measures and suggestions for improvement, the role of sports club activities and training, and the impact of family health concepts and the degree of support.

Thank you for your cooperation in filling out this questionnaire.

Mrs.Yang Xiaodan

1. Gender

☐ Male ☐ Female

☐ Freshman ☐ Sophomore ☐ Junior ☐ Senior

Direction: Please carefully read the following items (Questions 1-28). Based on the description in the "Current Situation" section and combined with your actual situation, select an option from the five levels that matches your current situation. At the same time, based on the description in the "Desired Situation" section, select an option from the five levels that you think should be achieved and possessed in the formulation of good health education management strategies to promote undergraduate students' continuous sports participation. The specific level divisions are as follows:

1= Lowest level, 2= Low level, 3= Medium level, 4= High level, 5= Highest level

[illegible]

7. Intensity of the Campus Sports Atmosphere										
Assessment Items	Current situations					Desirable situations				
	5	4	3	2	1	5	4	3	2	1
Health and Awareness Dimension										
8. Awareness of School Health Management										
9. Effectiveness of Health Management in Promoting Sports										
10. Intensity of Personal Health Awareness										
11. Correlation between Health Awareness and Continuity of Sports										
Living Habits Dimension										
12. Influence of Regular Work and Rest on Exercise Energy										
13. Support of Eating Habits for Exercise Performance										
14. Compatibility of Overall Living Habits										
Time Management Dimension										
15. Extrusion of Exercise Time by Daily Time Allocation										
16. Matching of Time Management Ability with Exercise Needs										
17. Exercise Experience under the Existing Time Pattern										
Incentive and Club Dimension										
18. Incentive Effect of the Sports Incentive Mechanism										
19. Recognition of the Fairness of Incentive Standards										
20. Sense of Gain from Participating in Club Activities										
21. Increase in Exercise Frequency by Club Activities										

22. Improvement of Sports Skills through Club Training										
Assessment Items	Current situations					Desirable situations				
	5	4	3	2	1	5	4	3	2	1
Psychology and Stress Dimension										
23. Obstruction of Exercise Willingness by Stress Level										
24. Effectiveness of Exercise as a Stress - Relief Method										
25. Facilitation of Sports by Mental Health Status										
26. Guiding Role of Family Health Concepts										
Family Influence Dimension										
27. Degree of Family Support for Sports										
28. Comprehensive Influence of Family Factors on Sports										

Thank you again for your participation and wish you all the best!



陕西科技大学镐京学院

HAQJING COLLEGE SHAANXI UNIVERSITY OF SCIENCE & TECHNOLOGY

Interview Form

Good Health Educational Management Strategies for Enhancing Sustainable Sports Participation of Undergraduate Students

Direction:

1.This interview form focuses on the current factors related to the enhancing of undergraduate students' continuous sports participation through good health-education management strategies, as well as the supporting factors for their development. The aim of this research is to explore the components of good health-education management strategies that can enhance undergraduate students' continuous sports participation, formulate practical strategies to improve the sustainability of undergraduate students' sports participation, and conduct a comprehensive evaluation of these strategies.

2.This interview form is designed for expert review and is divided into two parts, consisting of 10 questions and relevant suggestions.

3.Your opinions on the interview form will contribute to the formulation of management strategies for promoting undergraduate students' continuous sports participation through good health - education management strategies. Filling out this questionnaire will have no impact on you personally. The data collected will only be used for a general overview, and researchers will only use these data for research purposes. Thank you for your support.

Thank you very much for taking the precious time to participate in this interview. Your views are of great significance to this research.

Mrs. Yang Xiaodan

Bansomdejchaopraya Rajabhat University

Part I: Personal Information

Interviewer.....Interview Date.....

Interview Time.....Interviewee.....

Gender.....Age.....

Years old.....

Education background.....Position.....

Work place.....

Part II: Factors in the Formulation of Good Health Education Management Strategies to Enhance Undergraduate Students' Sustained Participation in Sports

Factors for enhancing sports participation
1. How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?
2. How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?
3. How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

4. How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

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5. How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

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6. How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

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7. How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

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8. How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

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9. How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

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10. How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

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Suggestion:

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Appendix D

The Results of the Quality Analysis of Research Instruments

The Quality Analysis Results of Research Instruments

The consistency evaluation results of the questionnaire survey on the development status of good health educational management strategies for enhancing sustainable sports participation of undergraduate students.

1. The quality analysis results of Questionnaire.

clause	The current situation and desirable situation of enhancing sustainable sports participation of undergraduate students	Experts					IOC	Conclusion
		1	2	3	4	5		
Educational and Knowledge Dimension								
1	Rationality of the Arrangement of School Health Education Courses	1	1	1	1	1	1.00	consistent
2	Practicality of Knowledge and Skill Improvement in Courses	1	1	1	1	1	1.00	consistent
3	Enthusiasm for Participation Stimulated by Teaching Methods	1	1	1	1	1	1.00	consistent
4	Helpfulness of Obtaining Health Knowledge Outside Class	1	1	1	1	1	1.00	consistent
Campus Environment Dimension								
1	Attractiveness of School Sports Activities	1	1	1	1	1	1.00	consistent
2	Completeness and Usability of Sports Facilities	1	1	1	1	1	1.00	consistent
3	Intensity of the Campus Sports Atmosphere	1	1	1	1	1	1.00	consistent
Health and Awareness Dimension								
1	Awareness of School Health Management	1	1	1	1	1	1.00	consistent
2	Effectiveness of Health Management in Promoting Sports	1	1	1	1	1	1.00	consistent
3	Intensity of Personal Health Awareness	1	1	1	1	1	1.00	consistent
4	Correlation between Health Awareness and Continuity of Sports	1	1	1	1	1	1.00	consistent

clause	The current situation and desirable situation of enhancing sustainable sports participation of undergraduate students	Experts					IOC	Conclusion
		1	2	3	4	5		
Living Habits Dimension								
1	Influence of Regular Work and Rest on Exercise Energy	1	1	1	1	1	1.00	consistent
2	Support of Eating Habits for Exercise Performance	1	1	1	1	1	1.00	consistent
3	Compatibility of Overall Living Habits	1	1	1	1	1	1.00	consistent
Time Management Dimension								
1	Extrusion of Exercise Time by Daily Time Allocation	1	1	1	1	1	1.00	consistent
2	Matching of Time Management Ability with Exercise Needs	1	1	1	1	1	1.00	consistent
3	Exercise Experience under the Existing Time Pattern	1	1	1	1	1	1.00	consistent
Incentive and Club Dimension								
1	Incentive Effect of the Sports Incentive Mechanism	1	1	1	1	1	1.00	consistent
2	Recognition of the Fairness of Incentive Standards	1	1	1	1	1	1.00	consistent
3	Sense of Gain from Participating in Club Activities	1	1	1	1	1	1.00	consistent
4	Increase in Exercise Frequency by Club Activities	1	1	1	1	1	1.00	consistent
5	Improvement of Sports Skills through Club Training	1	1	1	1	1	1.00	consistent
Psychology and Stress Dimension								
1	Obstruction of Exercise Willingness by Stress Level	1	1	1	1	1	1.00	consistent
2	Effectiveness of Exercise as a Stress-Relief Method	1	1	1	1	1	1.00	consistent
3	Facilitation of Sports by Mental Health Status	1	1	1	1	1	1.00	consistent

clause	The current situation and desirable situation of enhancing sustainable sports participation of undergraduate students	Experts					IOC	Conclusion
		1	2	3	4	5		
Family Influence Dimension								
1	Guiding Role of Family Health Concepts	1	1	1	1	1	1.00	consistent
2	Degree of Family Support for Sports	1	1	1	1	1	1.00	consistent
3	Comprehensive Influence of Family Factors on Sports	1	1	1	1	1	1.00	consistent

2. The quality analysis results of Interview.

clause	The factors promoting development	Experts					IOC	Conclusion
		1	2	3	4	5		
1	How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?	1	1	1	1	1	1.00	consistent
2	How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?	1	1	1	1	1	1.00	consistent
3	How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?	1	1	1	1	1	1.00	consistent
4	How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of students, and how can	1	1	1	1	1	1.00	consistent

clause	The factors promoting development	Experts					IOC	Conclusion
		1	2	3	4	5		
	they be incorporated into the strategy - making?							
5	How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?	1	1	1	1	1	1.00	consistent
6	How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?	1	1	1	1	1	1.00	consistent
7	How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?	1	1	1	1	1	1.00	consistent
8	How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?	1	1	1	1	1	1.00	consistent
9	How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?	1	1	1	1	1	1.00	consistent
10	How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among students?	1	1	1	1	1	1.00	consistent

3. The quality analysis results of evaluation form.

clause	The factors promoting development	Experts					IOC	Conclusion
		1	2	3	4	5		
Strategies for Innovation of Education and Knowledge System								
1	Reconstruct the curriculum system	1	1	1	1	1	1.00	consistent
2	Innovate the teaching mode	1	1	1	1	1	1.00	consistent
3	Optimize the evaluation system	1	1	1	1	1	1.00	consistent
4	Integrate educational resources	1	1	1	1	1	1.00	consistent
5	Strengthen digital empowerment	1	1	1	1	1	1.00	consistent
6	Deepen teacher training	1	1	1	1	1	1.00	consistent
7	Promote policy alignment	1	1	1	1	1	1.00	consistent
8	Strengthen international integration	1	1	1	1	1	1.00	consistent
9	Establish a feedback mechanism	1	1	1	1	1	1.00	consistent
10	Cultivate an innovative ecosystem	1	1	1	1	1	1.00	consistent
Strategies for Optimization of Campus Environment								
1	Optimize the layout of campus space	1	1	1	1	1	1.00	consistent
2	Cultivate the atmosphere of sports culture	1	1	1	1	1	1.00	consistent
3	Improve the accessibility of facilities	1	1	1	1	1	1.00	consistent
4	Promote the construction of the club ecosystem	1	1	1	1	1	1.00	consistent
5	Strengthen digital integration	1	1	1	1	1	1.00	consistent
6	Establish a feedback mechanism	1	1	1	1	1	1.00	consistent
7	Green campus initiative	1	1	1	1	1	1.00	consistent
8	Create an inclusive space	1	1	1	1	1	1.00	consistent
9	Time period management	1	1	1	1	1	1.00	consistent
10	Policy support framework	1	1	1	1	1	1.00	consistent
Strategies for Cultivation of Health Awareness								
1	Develop interactive health courses	1	1	1	1	1	1.00	consistent
2	Establish a peer health tutor system	1	1	1	1	1	1.00	consistent
3	Carry out health literacy promotion activities	1	1	1	1	1	1.00	consistent

clause	The factors promoting development	Experts					IOC	Conclusion
		1	2	3	4	5		
4	Implement health passports	1	1	1	1	1	1.00	consistent
5	Establish a health literacy assessment	1	1	1	1	1	1.00	consistent
6	Promote interdisciplinary cooperation	1	1	1	1	1	1.00	consistent
7	Utilize artificial intelligence health	1	1	1	1	1	1.00	consistent
8	Establish a health ambassador program	1	1	1	1	1	1.00	consistent
9	Integrate health into academic courses	1	1	1	1	1	1.00	consistent
10	Formulate health literacy standards	1	1	1	1	1	1.00	consistent
11	Conduct health impact assessments	1	1	1	1	1	1.00	consistent
Strategies for Intervention in Living Habits								
1	Develop a personalized habit plan	1	1	1	1	1	1.00	consistent
2	Implement a habit tracking system	1	1	1	1	1	1.00	consistent
3	Create a supportive environment	1	1	1	1	1	1.00	consistent
4	Cultivate a sense of social responsibility	1	1	1	1	1	1.00	consistent
5	Gamify habit formation	1	1	1	1	1	1.00	consistent
6	Integrate health into academic curriculums	1	1	1	1	1	1.00	consistent
7	Utilize digital platforms	1	1	1	1	1	1.00	consistent
8	Establish a health contract	1	1	1	1	1	1.00	consistent
9	Hold time management workshops	1	1	1	1	1	1.00	consistent
10	Conduct health audits	1	1	1	1	1	1.00	consistent
11	Build community gardens	1	1	1	1	1	1.00	consistent
12	Create smoke-free or alcohol-restricted areas	1	1	1	1	1	1.00	consistent
13	Create an environment conducive to sleep	1	1	1	1	1	1.00	consistent
14	Hold cultural celebration activities	1	1	1	1	1	1.00	consistent
15	Monitor and adjust strategies	1	1	1	1	1	1.00	consistent
Strategies for Improvement of Time Management								
1	Develop intelligent scheduling tools	1	1	1	1	1	1.00	consistent
2	Hold time planning workshops	1	1	1	1	1	1.00	consistent

clause	The factors promoting development	Experts					IOC	Conclusion
		1	2	3	4	5		
3	Integrate physical education into the curriculum	1	1	1	1	1	1.00	consistent
4	Utilize wearable technology	1	1	1	1	1	1.00	consistent
5	Establish a priority matrix	1	1	1	1	1	1.00	consistent
6	Optimize the opening hours of facilities	1	1	1	1	1	1.00	consistent
7	Create a time management dashboard	1	1	1	1	1	1.00	consistent
8	Implement a staggered class schedule	1	1	1	1	1	1.00	consistent
9	Develop micro-exercise programs	1	1	1	1	1	1.00	consistent
10	Establish a peer supervision system	1	1	1	1	1	1.00	consistent
11	Gamify time allocation	1	1	1	1	1	1.00	consistent
12	Conduct a time audit	1	1	1	1	1	1.00	consistent
13	Establish industry -university -research cooperation relationships	1	1	1	1	1	1.00	consistent
Strategies for Construction of Incentive and Club Ecosystem								
1	Implement a hierarchical reward system	1	1	1	1	1	1.00	consistent
2	Carry out corporate sponsorship programs	1	1	1	1	1	1.00	consistent
3	Launch digital badges	1	1	1	1	1	1.00	consistent
4	Establish an alumni mentoring network	1	1	1	1	1	1.00	consistent
5	Create interdisciplinary sports leagues	1	1	1	1	1	1.00	consistent
6	Integrate gamification elements	1	1	1	1	1	1.00	consistent
7	Implement peer referral incentives	1	1	1	1	1	1.00	consistent
8	Formulate a sustainable development framework for student associations	1	1	1	1	1	1.00	consistent
9	Establish interundergraduateiate alliances	1	1	1	1	1	1.00	consistent
10	Utilize social media for promotion	1	1	1	1	1	1.00	consistent
11	Create the role of sports ambassadors	1	1	1	1	1	1.00	consistent
12	Implement performance evaluations for student associations	1	1	1	1	1	1.00	consistent
Strategies for Regulation of Psychological Stress								
1	Combine physical education with mindfulness practices	1	1	1	1	1	1.00	consistent

clause	The factors promoting development	Experts					IOC	Conclusion
		1	2	3	4	5		
2	Establish mental health counseling	1	1	1	1	1	1.00	consistent
3	Hold stress management workshops	1	1	1	1	1	1.00	consistent
4	Utilize artificial intelligence mental health tools	1	1	1	1	1	1.00	consistent
5	Carry out exercise therapy programs	1	1	1	1	1	1.00	consistent
6	Cultivate a peer support network	1	1	1	1	1	1.00	consistent
7	Develop a stress tracking application	1	1	1	1	1	1.00	consistent
8	Integrate physical education into academic counseling	1	1	1	1	1	1.00	consistent
9	Set up stress relief areas	1	1	1	1	1	1.00	consistent
10	Implement exercise-based art therapy	1	1	1	1	1	1.00	consistent
Strategies for Reconstruction of Family Support System								
1	Establish home-school cooperation relationships	1	1	1	1	1	1.00	consistent
2	Provide sports scholarships	1	1	1	1	1	1.00	consistent
3	Hold family sports workshops	1	1	1	1	1	1.00	consistent
4	Develop a digital family platform	1	1	1	1	1	1.00	consistent
5	Sign a family sports contract	1	1	1	1	1	1.00	consistent
6	Incorporate family health assessments	1	1	1	1	1	1.00	consistent
7	Establish family counseling services	1	1	1	1	1	1.00	consistent
8	Form a family sports club	1	1	1	1	1	1.00	consistent
9	Implement an equipment subsidy plan	1	1	1	1	1	1.00	consistent
10	Carry out cultural awareness promotion activities	1	1	1	1	1	1.00	consistent
11	Hold parent training programs	1	1	1	1	1	1.00	consistent
12	Establish a feedback mechanism	1	1	1	1	1	1.00	consistent
13	Create a Family Sports Day	1	1	1	1	1	1.00	consistent
14	Integrate community resources	1	1	1	1	1	1.00	consistent
Strategies for Establishment of Dynamic Risk Management System								
1	Regularly assess health risks	1	1	1	1	1	1.00	consistent
2	Safety monitoring mechanism for facilities	1	1	1	1	1	1.00	consistent

clause	The factors promoting development	Experts					IOC	Conclusion
		1	2	3	4	5		
3	Risk early warning system	1	1	1	1	1	1.00	consistent
5	Risk management training for teachers	1	1	1	1	1	1.00	consistent
6	Formulation of emergency response plans	1	1	1	1	1	1.00	consistent
7	Analysis of accident data	1	1	1	1	1	1.00	consistent
8	Design of risk awareness courses	1	1	1	1	1	1.00	consistent
9	Risk feedback channels	1	1	1	1	1	1.00	consistent
10	Standardized management of clubs	1	1	1	1	1	1.00	consistent
11	Safety inspection of venues	1	1	1	1	1	1.00	consistent
12	Risk management by schools and families	1	1	1	1	1	1.00	consistent
13	Monitoring by digital technology	1	1	1	1	1	1.00	consistent
14	Intervention for psychological stress	1	1	1	1	1	1.00	consistent
15	Individualized intensity adjustment	1	1	1	1	1	1.00	consistent
16	Evaluation of risk management	1	1	1	1	1	1.00	consistent
Strategies for Establishment of Dynamic Risk Management System								
1	Establish a biennial stakeholder summit	1	1	1	1	1	1.00	consistent
2	Carry out joint strategic planning	1	1	1	1	1	1.00	consistent
3	Implement a stakeholder feedback portal	1	1	1	1	1	1.00	consistent
4	Create cross-departmental partnerships	1	1	1	1	1	1.00	consistent
5	Conduct an annual needs assessment	1	1	1	1	1	1.00	consistent
6	Establish a shared governance framework	1	1	1	1	1	1.00	consistent
7	Formulate a joint funding plan	1	1	1	1	1	1.00	consistent
8	Carry out cooperative training programs	1	1	1	1	1	1.00	consistent
9	Create communication channels							
10	Establish intergenerational sports programs	1	1	1	1	1	1.00	consistent
11	Develop a shared measurement framework	1	1	1	1	1	1.00	consistent
12	Hold cultural sensitivity workshops	1	1	1	1	1	1.00	consistent
13	Create industry-academic cooperation	1	1	1	1	1	1.00	consistent
14	Establish joint research projects	1	1	1	1	1	1.00	consistent

clause	The factors promoting development	Experts					IOC	Conclusion
		1	2	3	4	5		
15	Build a community sports center	1	1	1	1	1	1.00	consistent
16	Implement commendation and rewards	1	1	1	1	1	1.00	consistent
17	Create a digital platform	1	1	1	1	1	1.00	consistent
18	Carry out joint advocacy activities	1	1	1	1	1	1.00	consistent
19	Conduct an annual assessment of the impact of cooperation	1	1	1	1	1	1.00	consistent
20	Formulate a sustainable development charter	1	1	1	1	1	1.00	consistent

Reliability analysis of research instruments
Results of variable reliability correlation analysis

Reliability

Scale: all variables

Case handling summary			
		N	%
case	effective	384	100
	Excluded ^a	0	0
	Total	384	100
a. List deletion based on all variables in this program.			

Reliability statistics		
Cronbach's Alpha	Based on standardized items Cronbachs Alpha	Number of terms
.953	.953	60

Interviewee

Interviewer 1

1.How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is necessary to reconstruct the curriculum system to integrate innovative educational concepts; 2) innovating the teaching mode can enhance students' engagement in sports education; 3) strengthening digital empowerment helps incorporate smart technology into sports curricula; 4) promoting policy connection is crucial to align sports education with national strategies; 5) enhancing international integration can introduce global best practices in sports education; 6) cultivating an innovative ecosystem fosters collaborative development of sports knowledge.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) optimizing campus spatial layout should prioritize accessible and functional sports areas; 2) cultivating a sports culture atmosphere can inspire students' sustainable participation through events and campaigns; 3) establishing feedback mechanisms allows continuous improvement of campus sports environments; 4) creating inclusive spaces ensures all students can engage in sports regardless of their backgrounds; 5) supporting a policy support framework provides institutional guarantees for campus sports development.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) developing interactive health curricula can enhance students' practical understanding of health and sports; 2) implementing health passports helps track students' health progress and sports participation; 3) leveraging AI health coaches enables personalized health guidance for students; 4) integrating health into academic programs promotes a holistic approach to student well-being; 5) developing health literacy standards establishes clear benchmarks for students' health awareness.

4. How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) developing personalized habit plans caters to students' unique lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their sports routines; 3) creating supportive environments, such as fitness-friendly dorms, encourages daily exercise; 4) fostering social accountability through peer groups motivates consistent sports participation; 5) gamifying habit formation makes sports more engaging through rewards and challenges; 6) integrating health into academic curricula ensures health concepts are embedded in daily learning; 7) leveraging digital platforms provides convenient tools for students to manage their sports schedules; 8) establishing sleep-friendly environments supports students' physical recovery for sustained sports performance.

5. How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students balance academic and sports time efficiently; 2) integrating sports into curricula ensures regular physical activity becomes part of academic requirements; 3) establishing priority matrices helps students prioritize sports within their busy schedules; 4) creating time management dashboards provides visual tools for students to track their sports commitments; 5) implementing staggered class schedules reduces time conflicts and increases sports accessibility; 6) developing micro-workout programs suits students' tight schedules with short, effective exercises; 7) gamifying time allocation makes sports planning more enjoyable through goal-based rewards.

6. How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate sponsorship programs secures resources for campus sports activities and facilities; 3) creating interdisciplinary sports leagues fosters collaboration and diversity in sports engagement; 4) integrating gamification elements, like points and

leaderboards, enhances students' motivation; 5) developing club sustainability frameworks ensures long-term operation of sports clubs on campus; 6) implementing club performance evaluations helps optimize club activities and student involvement.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) establishing mental health counseling services supports students' psychological well-being through sports; 2) implementing stress management workshops teaches students to use sports as a stress-relief tool; 3) creating sports therapy programs combines physical activity with mental health rehabilitation; 4) developing stress-tracking apps allows students to monitor how sports impact their emotional state; 5) integrating sports into academic counseling helps students balance study and exercise for better focus.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops encourages joint participation and support from family members; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) establishing family counseling services addresses psychological barriers to sports participation; 5) implementing equipment subsidy programs reduces financial barriers for students to access sports resources; 6) creating family sports days fosters a supportive environment through shared family sports experiences.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly assessing students' physical and mental health risks ensures safe and sustainable sports participation; 2) setting up a monitoring mechanism for sports facilities ensures their safe and proper usage; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) collecting and analyzing sports injury data helps identify trends and improve safety measures; 5) incorporating risk assessment into sports course design prioritizes student safety in curriculum planning; 6) conducting regular

safety inspections of sports venues prevents accidents caused by equipment failures; 7) using digital technology to monitor sports risks enables real-time tracking and emergency response; 8) adjusting sports activities based on students' physical conditions ensures personalized and safe exercise.

10. How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures equal participation from all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize areas for collaborative improvement; 5) establishing shared governance frameworks fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support for sports programs; 7) creating stakeholder-specific communication channels ensures targeted feedback and engagement; 8) establishing intergenerational sports programs connects alumni and current students for knowledge sharing; 9) creating industry-academia partnerships drives innovation in sports technology and education; 10) establishing joint research initiatives addresses practical barriers to sustainable sports participation.

Interviewer 2

1. How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is essential to revamp the curriculum framework to embed innovative educational concepts; 2) upgrading the teaching mode can boost students' engagement in sports education; 3) streamlining the evaluation system helps enhance the effectiveness of sports education; 4) consolidating educational resources enables comprehensive utilization of teaching materials; 5) reinforcing digital enablement assists in integrating smart technology into sports curricula; 6) facilitating policy alignment is key to integrating sports education with national development strategies; 7) promoting international integration allows the

adoption of global best practices in sports education; 8) establishing a feedback mechanism enables continuous improvement of the educational system.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) reconfiguring campus spatial layout should prioritize accessible and functional sports zones; 2) nurturing a sports culture atmosphere can inspire sustainable participation through thematic campaigns; 3) enhancing facility accessibility ensures students can easily access sports equipment; 4) strengthening digital integration promotes the smart management of campus sports facilities; 5) establishing feedback mechanisms allows continuous optimization of campus sports environments; 6) supporting a policy support framework provides institutional safeguards for campus sports development; 7) creating inclusive spaces ensures all students can engage in sports regardless of their backgrounds.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) designing interactive health curricula can deepen students' practical understanding of health and sports; 2) establishing peer health mentors helps promote health awareness among students; 3) implementing health passports assists in tracking students' long-term health progress and sports participation; 4) developing health literacy assessment systems sets clear benchmarks for students' health awareness; 5) leveraging AI health coaches enables data-driven personalized health guidance; 6) launching health ambassador programs fosters peer-to-peer health promotion; 7) integrating health into academic programs promotes a holistic approach to student well-being; 8) formulating health literacy standards establishes clear evaluation criteria for students' health cognition; 9) conducting health impact assessments helps evaluate the effectiveness of health initiatives.

4.How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) formulating personalized habit plans caters to students' diverse lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their sports routines in real time; 3) creating

supportive environments, such as fitness-oriented dormitories, encourages daily physical activity; 4) integrating health into academic curricula ensures health concepts are embedded in daily teaching; 5) leveraging digital platforms provides convenient tools for students to manage sports schedules; 6) establishing health contracts formalizes students' commitments to sports habits; 7) organizing time management workshops helps students balance sports and academic schedules; 8) creating smoke-free/alcohol-restricted zones fosters a healthy campus sports environment; 9) establishing sleep-friendly environments supports students' physical recovery for sustained sports performance.

5. How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) launching time-blocking workshops teaches students effective time management techniques; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) optimizing facility operation hours increases students' access to sports venues; 4) creating time management dashboards provides visual tools for students to track sports commitments; 5) implementing staggered class schedules reduces time conflicts and enhances sports accessibility; 6) designing micro-workout programs suits students' tight schedules with short, high-efficiency exercises; 7) gamifying time allocation makes sports planning more engaging through goal-based reward systems; 8) conducting time utilization audits helps students identify areas for time optimization.

6. How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing digital achievement badges provides tangible recognition for sports accomplishments; 3) creating interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as points and leaderboards, enhances students' motivation; 5) launching peer referral incentive programs encourages word-of-mouth promotion of sports activities; 6) developing club sustainability frameworks ensures long-term operation of campus sports clubs; 7) creating sports ambassador roles promotes student leadership in sports

initiatives; 8) implementing club performance evaluation systems helps optimize club activities and member involvement.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) integrating sports with mindfulness practices combines physical activity with mental relaxation; 2) establishing mental health counseling services supports students' psychological well-being through sports; 3) organizing stress management workshops teaches students to use sports as a stress-relief tool; 4) leveraging AI mental health tools enables personalized psychological support for students; 5) creating sports therapy programs combines physical activity with mental health rehabilitation; 6) developing stress-tracking apps allows students to monitor the impact of sports on their emotional state; 7) integrating sports into academic counseling helps students balance study and exercise for better focus; 8) establishing dedicated stress-relief zones provides spaces for students to relax through sports.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnership networks builds a collaborative system to promote students' sports habits; 2) providing sports participation scholarships reduces financial barriers to sports engagement; 3) launching family sports workshop series encourages joint participation and mutual support from family members; 4) developing digital family communication platforms facilitates real-time collaboration between schools and families; 5) implementing family sports commitment contracts formalizes long-term sports engagement; 6) integrating family health impact evaluations helps assess the effect of family support on sports habits; 7) establishing family psychological counseling services addresses psychological barriers to sports participation; 8) forming family sports club alliances fosters shared sports experiences among family members; 9) implementing sports equipment subsidy programs reduces financial barriers to sports resources; 10) providing parent sports education training programs enhances family literacy in supporting students' sports habits.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly conducting students' physical and mental health risk assessments ensures safe sports participation; 2) establishing a sports facility safety monitoring mechanism ensures their proper usage; 3) building an early warning system for sports risks allows timely intervention in potential hazards; 4) continuously updating sports safety education content keeps students informed of best practices; 5) providing regular risk management training for PE teachers enhances their student safety management capabilities; 6) developing comprehensive emergency response plans for sports accidents prepares schools for unexpected incidents; 7) collecting and analyzing sports injury big data helps identify trends and improve safety measures; 8) incorporating risk assessment into sports course design prioritizes student safety in curriculum planning; 9) encouraging students to report potential risks in a timely manner fosters a campus safety culture; 10) strengthening sports club risk management systems ensures safe club operations; 11) conducting periodic safety inspections of sports venues and equipment prevents equipment-related accidents; 12) establishing a school-family risk management communication mechanism enhances collaborative safety management; 13) using digital intelligent technology to monitor sports risks enables real-time tracking and emergency response; 14) providing sports stress psychological counseling services supports students' mental well-being during sports participation.

10.How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual multi-stakeholder summits involving students, faculty, parents, and policymakers gathers diverse perspectives to refine sports strategies; 2) forming joint strategic planning committees with equal representation from all stakeholder groups ensures inclusive decision-making; 3) implementing real-time stakeholder feedback portals allows continuous improvement of sports policies and programs; 4) creating cross-sector collaboration partnerships with sports organizations, healthcare institutions, and NGOs expands resource integration; 5) conducting annual stakeholder needs assessment surveys helps prioritize collaborative improvement areas; 6) establishing shared governance frameworks for sports initiatives fosters

transparent decision-making; 7) developing multi-source joint funding mechanisms with government, enterprises, and alumni secures long-term financial support; 8) launching collaborative training programs for faculty, coaches, and student leaders enhances professional capabilities in sports education; 9) creating stakeholder-specific communication channels, such as parent newsletters and student forums, ensures targeted feedback; 10) establishing intergenerational sports exchange programs connects alumni and current students through sports; 11) developing shared performance measurement frameworks for collaborative initiatives enables objective effect evaluation; 12) conducting cultural sensitivity training workshops promotes inclusive collaboration among diverse stakeholders; 13) creating industry-academia-research partnerships for sports technology innovation drives advancements in sports education; 14) establishing joint research task forces to address sports participation barriers fosters evidence-based solutions; 15) developing community shared sports hub projects enhances sports accessibility for all stakeholders.

Interviewer 3

1.How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is essential to restructure the curriculum system to embed innovative educational concepts; 2) innovating the teaching mode can boost students' engagement in sports education; 3) optimizing the evaluation system helps enhance the effectiveness of sports education; 4) promoting policy connection is key to aligning sports education with national development strategies; 5) enhancing international integration allows the adoption of global best practices in sports education; 6) strengthening digital empowerment assists in integrating smart technology into sports curricula.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) optimizing campus spatial layout should focus on creating accessible and functional sports zones; 2) cultivating a sports culture atmosphere

can inspire students' sustainable participation through themed events; 3) strengthening digital integration promotes the smart management of campus sports facilities; 4) launching a green campus initiative combines environmental protection with sports space design; 5) supporting a policy support framework provides institutional safeguards for campus sports development; 6) creating inclusive spaces ensures equal access to sports for all students.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) developing interactive health curricula can deepen students' practical understanding of health and sports; 2) establishing peer health mentors helps foster a culture of health awareness among students; 3) leveraging AI health coaches enables personalized health guidance based on student data; 4) integrating health into academic programs promotes a holistic approach to student well-being; 5) developing health literacy standards sets clear benchmarks for students' health cognition; 6) implementing health passports assists in tracking long-term health and sports participation.

4.How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) developing personalized habit plans caters to students' diverse lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their exercise routines; 3) creating supportive environments, such as fitness-oriented dormitories, encourages daily physical activity; 4) gamifying habit formation makes sports participation more engaging through reward mechanisms; 5) integrating health into academic curricula ensures health concepts are embedded in daily teaching; 6) promoting time management workshops helps students balance sports and academic schedules; 7) establishing smoke-free zones contributes to a healthy campus sports environment.

5.How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students efficiently balance academic and sports time; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) implementing

time-blocking workshops teaches students systematic time management techniques; 4) optimizing facility hours increases students' access to sports venues; 5) implementing staggered class schedules reduces conflicts and enhances sports accessibility; 6) developing micro-workout programs suits students' tight schedules with efficient short exercises; 7) creating time management dashboards provides visual tools for tracking sports commitments.

6.How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate sponsorship programs secures resources for campus sports activities; 3) creating interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as points and leaderboards, enhances student motivation; 5) developing club sustainability frameworks ensures the long-term operation of sports clubs; 6) implementing club performance evaluations helps optimize activities and member involvement; 7) establishing alumni mentorship networks connects students with sports professionals.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) establishing mental health counseling services supports students' psychological well-being through sports; 2) implementing stress management workshops teaches students to use sports as a stress-relief method; 3) leveraging AI mental health tools provides personalized psychological support for students; 4) creating sports therapy programs combines physical activity with mental health rehabilitation; 5) developing stress-tracking apps allows students to monitor the impact of sports on their emotional state; 6) integrating sports into academic counseling helps students balance study and exercise for better focus; 7) establishing stress-relief zones provides dedicated spaces for sports-based relaxation.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops encourages joint participation and mutual support; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) integrating family health evaluations helps assess the impact of family support on sports habits; 5) establishing family counseling services addresses psychological barriers to sports participation; 6) implementing equipment subsidy programs reduces financial barriers to sports resources; 7) creating family sports days fosters shared sports experiences among family members; 8) developing digital family platforms facilitates real-time communication on sports habits.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly assessing students' physical and mental health risks ensures safe sports participation; 2) setting up a monitoring mechanism for sports facilities ensures their safe and proper use; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) providing regular training for PE teachers on risk management enhances their safety management capabilities; 5) developing emergency response plans for sports accidents prepares schools for unexpected incidents; 6) collecting and analyzing sports injury data helps identify trends and improve safety measures; 7) incorporating risk assessment into sports course design prioritizes student safety in curriculum planning; 8) conducting regular safety inspections of sports venues prevents equipment-related accidents; 9) using digital technology to monitor sports risks enables real-time tracking and emergency response.

10.How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures inclusive decision-making among all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize collaborative improvement areas; 5) establishing shared governance frameworks fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support; 7) launching

collaborative training programs for faculty and student leaders enhances professional capabilities; 8) creating industry-academia partnerships drives innovation in sports technology; 9) establishing joint research initiatives addresses practical barriers to sports participation.

Interviewer 4

1.How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is vital to restructure the curriculum system to integrate innovative educational concepts; 2) revamping the teaching mode can enhance students' engagement in sports education; 3) optimizing the evaluation system helps improve the effectiveness of sports education; 4) promoting policy connection is key to aligning sports education with national development strategies; 5) enhancing international integration allows the introduction of global best practices in sports education; 6) strengthening digital empowerment assists in incorporating smart technology into sports curricula.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) optimizing campus spatial layout should focus on creating accessible sports zones; 2) cultivating a sports culture atmosphere can inspire sustainable participation through thematic campaigns; 3) enhancing facility accessibility ensures students can easily utilize sports equipment; 4) strengthening digital integration promotes smart management of campus sports facilities; 5) creating inclusive spaces ensures equal sports opportunities for all students; 6) supporting a policy support framework provides institutional guarantees for campus sports development.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) developing interactive health curricula can deepen students' practical understanding of health and sports; 2) implementing health passports helps track long-term health progress and sports participation; 3) leveraging AI

health coaches enables data-driven personalized health guidance; 4) integrating health into academic programs promotes a holistic approach to student well-being; 5) establishing peer health mentors fosters a culture of health awareness among students; 6) developing health literacy standards sets clear benchmarks for students' health cognition.

4. How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) developing personalized habit plans caters to students' diverse lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their exercise routines; 3) creating supportive environments, such as fitness-oriented dorms, encourages daily physical activity; 4) integrating health into academic curricula ensures health concepts are embedded in daily learning; 5) leveraging digital platforms provides convenient tools for managing sports schedules; 6) fostering social accountability through peer groups motivates consistent sports participation; 7) establishing sleep-friendly environments supports physical recovery for sustained sports performance.

5. How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students efficiently balance academic and sports time; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) implementing time-blocking workshops teaches students systematic time management techniques; 4) establishing priority matrices helps students prioritize sports in busy schedules; 5) implementing staggered class schedules reduces time conflicts and enhances sports accessibility; 6) developing micro-workout programs suits tight schedules with short, effective exercises; 7) gamifying time allocation makes sports planning more engaging through goal-based rewards.

6. How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate

sponsorship programs secures resources for campus sports activities; 3) creating interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as points and leaderboards, enhances student motivation; 5) establishing alumni mentorship networks connects students with sports professionals; 6) developing club sustainability frameworks ensures long-term operation of sports clubs; 7) implementing club performance evaluations helps optimize activities and member involvement.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) establishing mental health counseling services supports students' psychological well-being through sports; 2) implementing stress management workshops teaches students to use sports as a stress-relief tool; 3) leveraging AI mental health tools provides personalized psychological support based on student data; 4) creating sports therapy programs combines physical activity with mental health rehabilitation; 5) integrating sports into academic counseling helps students balance study and exercise for better focus; 6) developing stress-tracking apps allows students to monitor the impact of sports on their emotional state; 7) fostering peer support networks enhances social motivation for sports participation.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops encourages joint participation and mutual support; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) developing digital family platforms facilitates real-time communication on sports habits; 5) integrating family health evaluations helps assess the impact of family support on sports habits; 6) implementing equipment subsidy programs reduces financial barriers to sports resources; 7) creating family sports days fosters shared sports experiences among family members; 8) establishing family counseling services addresses psychological barriers to sports participation.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly assessing students' physical and mental health risks ensures safe and sustainable sports participation; 2) setting up a monitoring mechanism for sports facilities ensures their safe and proper usage; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) collecting and analyzing sports injury data helps identify trends and improve safety measures; 5) incorporating risk assessment into sports course design prioritizes student safety in curriculum planning; 6) conducting regular safety inspections of sports venues prevents equipment-related accidents; 7) using digital technology to monitor sports risks enables real-time tracking and emergency response; 8) providing regular training for PE teachers on risk management enhances their safety management capabilities.

10.How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures inclusive decision-making among all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize collaborative improvement areas; 5) establishing shared governance frameworks fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support for sports programs; 7) creating stakeholder-specific communication channels ensures targeted feedback and engagement; 8) launching collaborative training programs for faculty and student leaders enhances professional capabilities; 9) establishing joint research initiatives addresses practical barriers to sports participation; 10) creating industry-academia partnerships drives innovation in sports technology and education.

Interviewer 5

1.How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of

undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is crucial to restructure the curriculum system to embed innovative educational concepts; 2) upgrading the teaching mode can enhance students' engagement in sports education; 3) optimizing the evaluation system helps improve the effectiveness of sports education; 4) integrating educational resources enables comprehensive utilization of teaching materials; 5) enhancing digital empowerment assists in incorporating smart technology into sports curricula; 6) promoting policy connection is key to aligning sports education with national strategies.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) optimizing campus spatial layout should focus on creating functional sports areas; 2) cultivating a sports culture atmosphere can inspire sustainable participation through themed activities; 3) enhancing facility accessibility ensures students can easily access sports equipment; 4) strengthening digital integration promotes smart management of campus sports facilities; 5) creating inclusive spaces ensures equal sports opportunities for all students; 6) supporting a policy support framework provides institutional guarantees for campus sports development.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) developing interactive health curricula can deepen students' practical understanding of health and sports; 2) implementing health passports helps track long-term health progress and sports participation; 3) leveraging AI health coaches enables data-driven personalized health guidance; 4) integrating health into academic programs promotes a holistic approach to student well-being; 5) establishing peer health mentors fosters a culture of health awareness among students; 6) developing health literacy standards sets clear benchmarks for students' health cognition.

4.How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) developing personalized habit plans caters to students' unique lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their exercise routines; 3) creating supportive environments, such as fitness-oriented dorms, encourages daily physical activity; 4) integrating health into academic curricula ensures health concepts are embedded in daily learning; 5) leveraging digital platforms provides convenient tools for managing sports schedules; 6) fostering social accountability through peer groups motivates consistent sports participation; 7) establishing sleep-friendly environments supports physical recovery for sustained sports performance.

5.How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students efficiently balance academic and sports time; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) implementing time-blocking workshops teaches students systematic time management techniques; 4) establishing priority matrices helps students prioritize sports in busy schedules; 5) implementing staggered class schedules reduces time conflicts and enhances sports accessibility; 6) developing micro-workout programs suits tight schedules with short, effective exercises; 7) gamifying time allocation makes sports planning more engaging through goal-based rewards.

6.How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate sponsorship programs secures resources for campus sports activities; 3) creating interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as points and leaderboards, enhances student motivation; 5) establishing alumni mentorship networks connects students with sports professionals; 6) developing club sustainability frameworks ensures long-term operation of sports clubs; 7) implementing club performance evaluations helps optimize activities and member involvement.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) establishing mental health counseling services supports students' psychological well-being through sports; 2) implementing stress management workshops teaches students to use sports as a stress-relief tool; 3) leveraging AI mental health tools provides personalized psychological support based on student data; 4) creating sports therapy programs combines physical activity with mental health rehabilitation; 5) integrating sports into academic counseling helps students balance study and exercise for better focus; 6) developing stress-tracking apps allows students to monitor the impact of sports on their emotional state; 7) fostering peer support networks enhances social motivation for sports participation.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops encourages joint participation and mutual support; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) developing digital family platforms facilitates real-time communication on sports habits; 5) integrating family health evaluations helps assess the impact of family support on sports habits; 6) implementing equipment subsidy programs reduces financial barriers to sports resources; 7) creating family sports days fosters shared sports experiences among family members; 8) establishing family counseling services addresses psychological barriers to sports participation.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly assessing students' physical and mental health risks ensures safe and sustainable sports participation; 2) setting up a monitoring mechanism for sports facilities ensures their safe and proper usage; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) collecting and analyzing sports injury data helps identify trends and improve safety measures; 5) incorporating risk assessment into sports course

design prioritizes student safety in curriculum planning; 6) conducting regular safety inspections of sports venues prevents equipment-related accidents; 7) using digital technology to monitor sports risks enables real-time tracking and emergency response; 8) providing regular training for PE teachers on risk management enhances their safety management capabilities.

10. How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures inclusive decision-making among all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize collaborative improvement areas; 5) establishing shared governance frameworks fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support for sports programs; 7) creating stakeholder-specific communication channels ensures targeted feedback and engagement; 8) launching collaborative training programs for faculty and student leaders enhances professional capabilities; 9) establishing joint research initiatives addresses practical barriers to sports participation; 10) creating industry-academia partnerships drives innovation in sports technology and education.

Interviewer 6

1. How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is essential to restructure the curriculum system for integrating innovative educational concepts; 2) upgrading the teaching mode can boost students' engagement in sports education; 3) optimizing the evaluation system helps enhance the effectiveness of sports education; 4) integrating educational resources enables comprehensive utilization of teaching materials; 5) enhancing digital empowerment assists in embedding smart technology into sports curricula; 6) promoting policy connection is key to aligning sports education with national development strategies.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) optimizing campus spatial layout should focus on creating accessible sports zones; 2) cultivating a sports culture atmosphere can inspire sustainable participation through thematic campaigns; 3) enhancing facility accessibility ensures students can easily access sports equipment; 4) strengthening digital integration promotes intelligent management of campus sports facilities; 5) establishing feedback mechanisms allows continuous improvement of the sports environment; 6) launching a green campus initiative combines environmental protection with sports space design; 7) creating inclusive spaces ensures equal sports opportunities for all students; 8) supporting a policy support framework provides institutional safeguards for campus sports development.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) developing interactive health curricula can deepen students' practical understanding of health and sports; 2) implementing health passports helps track long-term health progress and sports participation; 3) leveraging AI health coaches enables data-driven personalized health guidance; 4) integrating health into academic programs promotes a holistic approach to student well-being; 5) establishing peer health mentors fosters a culture of health awareness among students; 6) developing health literacy standards sets clear benchmarks for students' health cognition; 7) fostering interdisciplinary collaboration enhances the comprehensiveness of health education.

4.How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) creating personalized habit plans caters to students' diverse lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their exercise routines in real time; 3) constructing supportive environments, such as fitness-oriented dormitories, encourages daily physical activity; 4) integrating health into academic curricula ensures health concepts are embedded in daily teaching; 5) leveraging digital platforms provides convenient tools for managing sports schedules; 6) fostering

social accountability through peer groups motivates consistent sports participation; 7) establishing sleep-friendly environments supports physical recovery for sustained sports performance; 8) developing community gardens promotes outdoor sports engagement.

5.How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students efficiently balance academic and sports time; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) implementing time-blocking workshops teaches students systematic time management techniques; 4) establishing priority matrices helps students prioritize sports in busy schedules; 5) adjusting class schedules in a staggered manner reduces time conflicts and enhances sports accessibility; 6) creating micro-workout programs suits tight schedules with short, high-efficiency exercises; 7) gamifying time allocation makes sports planning more engaging through goal-based reward systems.

6.How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate sponsorship programs secures resources for campus sports activities; 3) creating interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as achievement badges and leaderboards, enhances student motivation; 5) establishing alumni mentorship networks connects students with sports professionals; 6) developing club sustainability frameworks ensures long-term operation of sports clubs; 7) implementing club performance evaluations helps optimize activities and member involvement; 8) establishing interundergraduate alliances expands sports exchange opportunities.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) establishing mental health counseling services supports students' psychological well-being through sports; 2) implementing stress management workshops teaches students to use sports as a stress-relief tool; 3) leveraging AI mental health tools provides personalized psychological support based on student data; 4) creating sports therapy programs combines physical activity with mental health rehabilitation; 5) integrating sports into academic counseling helps students balance study and exercise for better focus; 6) developing stress-tracking apps allows students to monitor the impact of sports on their emotional state; 7) fostering peer support networks enhances social motivation for sports participation; 8) establishing stress-relief zones provides dedicated spaces for sports-based relaxation.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops encourages joint participation and mutual support; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) developing digital family platforms facilitates real-time communication on sports habits; 5) integrating family health evaluations helps assess the impact of family support on sports habits; 6) implementing equipment subsidy programs reduces financial barriers to sports resources; 7) creating family sports days fosters shared sports experiences among family members; 8) establishing family counseling services addresses psychological barriers to sports participation; 9) organizing parent training programs enhances family literacy in sports support.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly assessing students' physical and mental health risks ensures safe and sustainable sports participation; 2) setting up a monitoring mechanism for sports facilities ensures their safe and proper usage; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) collecting and analyzing sports injury data helps identify trends and improve safety measures; 5) incorporating risk assessment into sports course design prioritizes student safety in curriculum planning; 6) conducting regular safety inspections of sports venues prevents equipment-related accidents; 7)

using digital technology to monitor sports risks enables real-time tracking and emergency response; 8) providing regular training for PE teachers on risk management enhances their safety management capabilities; 9) developing emergency response plans for sports accidents prepares schools for unexpected incidents.

10. How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures inclusive decision-making among all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize collaborative improvement areas; 5) establishing shared governance frameworks fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support for sports programs; 7) creating stakeholder-specific communication channels ensures targeted feedback and engagement; 8) launching collaborative training programs for faculty and student leaders enhances professional capabilities; 9) establishing joint research initiatives addresses practical barriers to sports participation; 10) creating industry-academia partnerships drives innovation in sports technology and education.

Interviewer 7

1. How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is essential to restructure the curriculum system for integrating innovative educational concepts; 2) upgrading the teaching mode can enhance students' engagement in sports education; 3) optimizing the evaluation system helps improve the effectiveness of sports education; 4) strengthening digital empowerment assists in embedding smart technology into sports curricula; 5) promoting policy connection is key to aligning sports education with national development strategies; 6) enhancing international integration allows the adoption of global best practices in sports education.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) optimizing campus spatial layout should focus on creating functional sports zones; 2) cultivating a sports culture atmosphere can inspire sustainable participation through thematic activities; 3) enhancing facility accessibility ensures students can easily utilize sports equipment; 4) strengthening digital integration promotes intelligent management of campus sports facilities; 5) establishing feedback mechanisms allows continuous improvement of the sports environment; 6) creating inclusive spaces ensures equal sports opportunities for all students; 7) supporting a policy support framework provides institutional safeguards for campus sports development.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) developing interactive health curricula can deepen students' practical understanding of health and sports; 2) implementing health passports helps track long-term health progress and sports participation; 3) leveraging AI health coaches enables data-driven personalized health guidance; 4) integrating health into academic programs promotes a holistic approach to student well-being; 5) establishing health ambassador programs fosters peer-to-peer health promotion; 6) developing health literacy standards sets clear benchmarks for students' health cognition; 7) leveraging AI health coaches enables personalized health guidance for students.

4.How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) creating personalized habit plans caters to students' diverse lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their exercise routines in real time; 3) constructing supportive environments, such as fitness-oriented dormitories, encourages daily physical activity; 4) integrating health into academic curricula ensures health concepts are embedded in daily teaching; 5) leveraging digital platforms provides convenient tools for managing sports schedules; 6) fostering social accountability through peer groups motivates consistent sports

participation; 7) establishing sleep-friendly environments supports physical recovery for sustained sports performance.

5.How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students efficiently balance academic and sports time; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) implementing time-blocking workshops teaches students systematic time management techniques; 4) establishing priority matrices helps students prioritize sports in busy schedules; 5) adjusting class schedules in a staggered manner reduces time conflicts and enhances sports accessibility; 6) creating micro-workout programs suits tight schedules with short, high-efficiency exercises; 7) gamifying time allocation makes sports planning more engaging through goal-based reward systems.

6.How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate sponsorship programs secures resources for campus sports activities; 3) creating interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as achievement badges and leaderboards, enhances student motivation; 5) establishing alumni mentorship networks connects students with sports professionals; 6) developing club sustainability frameworks ensures long-term operation of sports clubs; 7) implementing club performance evaluations helps optimize activities and member involvement.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) integrating sports with mindfulness combines physical activity with mental relaxation; 2) establishing mental health counseling services supports students' psychological well-being through sports; 3) implementing stress

management workshops teaches students to use sports as a stress-relief tool; 4) leveraging AI mental health tools provides personalized psychological support based on student data; 5) creating sports therapy programs combines physical activity with mental health rehabilitation; 6) developing stress-tracking apps allows students to monitor the impact of sports on their emotional state; 7) integrating sports into academic counseling helps students balance study and exercise for better focus.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops encourages joint participation and mutual support; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) developing digital family platforms facilitates real-time communication on sports habits; 5) integrating family health evaluations helps assess the impact of family support on sports habits; 6) implementing equipment subsidy programs reduces financial barriers to sports resources; 7) creating family sports days fosters shared sports experiences among family members; 8) establishing family counseling services addresses psychological barriers to sports participation.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly assessing students' physical and mental health risks ensures safe and sustainable sports participation; 2) setting up a monitoring mechanism for sports facilities ensures their safe and proper usage; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) collecting and analyzing sports injury data helps identify trends and improve safety measures; 5) incorporating risk assessment into sports course design prioritizes student safety in curriculum planning; 6) conducting regular safety inspections of sports venues prevents equipment-related accidents; 7) using digital technology to monitor sports risks enables real-time tracking and emergency response; 8) providing regular training for PE teachers on risk management enhances their safety management capabilities.

10. How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures inclusive decision-making among all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize collaborative improvement areas; 5) establishing shared governance frameworks fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support for sports programs; 7) launching collaborative training programs for faculty and student leaders enhances professional capabilities; 8) creating industry-academia partnerships drives innovation in sports technology and education; 9) establishing joint research initiatives addresses practical barriers to sports participation.

Interviewer 8

1. How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is crucial to restructure the curriculum framework to incorporate innovative educational concepts; 2) revamping the teaching mode can boost students' engagement in sports education; 3) optimizing the evaluation system helps enhance the effectiveness of sports education; 4) integrating educational resources enables comprehensive utilization of teaching materials; 5) enhancing digital empowerment assists in embedding smart technology into sports curricula; 6) promoting policy connection is key to aligning sports education with national development strategies; 7) enhancing international integration allows the adoption of global best practices in sports education.

2. How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) redesigning campus spatial layout should focus on creating accessible sports zones; 2) fostering a sports culture atmosphere can inspire

sustainable participation through thematic campaigns; 3) enhancing facility accessibility ensures students can easily access sports equipment; 4) strengthening digital integration promotes intelligent management of campus sports facilities; 5) establishing feedback mechanisms allows continuous improvement of the sports environment; 6) creating inclusive spaces ensures equal sports opportunities for all students; 7) supporting a policy support framework provides institutional safeguards for campus sports development.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) developing interactive health curricula can deepen students' practical understanding of health and sports; 2) implementing health passports helps track long-term health progress and sports participation; 3) leveraging AI health coaches enables data-driven personalized health guidance; 4) integrating health into academic programs promotes a holistic approach to student well-being; 5) establishing peer health mentors fosters a culture of health awareness among students; 6) developing health literacy standards sets clear benchmarks for students' health cognition; 7) establishing health ambassador programs enhances peer-to-peer health promotion.

4.How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) formulating personalized habit plans caters to students' diverse lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their exercise routines in real time; 3) constructing supportive environments, such as fitness-oriented dormitories, encourages daily physical activity; 4) integrating health into academic curricula ensures health concepts are embedded in daily teaching; 5) leveraging digital platforms provides convenient tools for managing sports schedules; 6) fostering social accountability through peer groups motivates consistent sports participation; 7) establishing sleep-friendly environments supports physical recovery for sustained sports performance.

5.How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students efficiently balance academic and sports time; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) conducting time-blocking workshops teaches students systematic time management techniques; 4) establishing priority matrices helps students prioritize sports in busy schedules; 5) staggering class schedules reduces time conflicts and enhances sports accessibility; 6) creating micro-workout programs suits tight schedules with short, high-efficiency exercises; 7) gamifying time allocation makes sports planning more engaging through goal-based reward systems.

6.How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate sponsorship programs secures resources for campus sports activities; 3) creating interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as achievement badges and leaderboards, enhances student motivation; 5) establishing alumni mentorship networks connects students with sports professionals; 6) developing club sustainability frameworks ensures long-term operation of sports clubs; 7) implementing club performance evaluations helps optimize activities and member involvement.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) integrating sports with mindfulness combines physical activity with mental relaxation; 2) establishing mental health counseling services supports students' psychological well-being through sports; 3) conducting stress management workshops teaches students to use sports as a stress-relief tool; 4) leveraging AI mental health tools provides personalized psychological support based on student data; 5) creating sports therapy programs combines physical activity with mental health rehabilitation; 6) developing stress-tracking apps allows students to monitor the impact of sports on their emotional state; 7) integrating sports into academic counseling helps students balance study and exercise for better focus.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops encourages joint participation and mutual support; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) developing digital family platforms facilitates real-time communication on sports habits; 5) integrating family health evaluations helps assess the impact of family support on sports habits; 6) implementing equipment subsidy programs reduces financial barriers to sports resources; 7) creating family sports days fosters shared sports experiences among family members; 8) establishing family counseling services addresses psychological barriers to sports participation.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly assessing students' physical and mental health risks ensures safe and sustainable sports participation; 2) setting up a monitoring mechanism for sports facilities ensures their safe and proper usage; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) collecting and analyzing sports injury data helps identify trends and improve safety measures; 5) incorporating risk assessment into sports course design prioritizes student safety in curriculum planning; 6) conducting regular safety inspections of sports venues prevents equipment-related accidents; 7) using digital technology to monitor sports risks enables real-time tracking and emergency response; 8) providing regular training for PE teachers on risk management enhances their safety management capabilities.

10.How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures inclusive decision-making among all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize collaborative improvement areas; 5) establishing shared governance frameworks

fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support for sports programs; 7) creating stakeholder-specific communication channels ensures targeted feedback and engagement; 8) launching collaborative training programs for faculty and student leaders enhances professional capabilities; 9) establishing joint research initiatives addresses practical barriers to sports participation; 10) creating industry-academia partnerships drives innovation in sports technology and education.

Interviewer 9

1.How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is essential to overhaul the curriculum system for integrating innovative educational concepts; 2) revamping the teaching mode can enhance students' engagement in sports education; 3) refining the evaluation system helps improve the effectiveness of sports education; 4) consolidating educational resources enables comprehensive utilization of teaching materials; 5) enhancing digital enablement assists in embedding smart technology into sports curricula; 6) facilitating policy alignment is key to integrating sports education with national strategies; 7) boosting international integration allows the adoption of global best practices in sports education; 8) implementing a feedback mechanism enables continuous improvement of the educational system.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) redesigning campus spatial arrangements should focus on creating accessible sports zones; 2) fostering a sports-centric culture can inspire sustainable participation through thematic activities; 3) enhancing facility accessibility ensures students can easily access sports equipment; 4) strengthening digital integration promotes intelligent management of campus sports facilities; 5) supporting a policy support framework provides institutional safeguards for campus sports development.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) developing interactive health curricula can deepen students' practical understanding of health and sports; 2) implementing health passports helps track long-term health progress and sports participation; 3) leveraging AI health coaches enables data-driven personalized health guidance; 4) integrating health into academic programs promotes a holistic approach to student well-being; 5) establishing peer health mentors fosters a culture of health awareness among students; 6) developing health literacy standards sets clear benchmarks for students' health cognition.

4.How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) formulating personalized habit plans caters to students' diverse lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their exercise routines in real time; 3) creating supportive environments, such as fitness-oriented dorms, encourages daily physical activity; 4) integrating health into academic curricula ensures health concepts are embedded in daily teaching; 5) leveraging digital platforms provides convenient tools for managing sports schedules; 6) fostering social accountability through peer groups motivates consistent sports participation; 7) establishing sleep-friendly environments supports physical recovery for sustained sports performance.

5.How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students efficiently balance academic and sports time; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) conducting time-blocking workshops teaches students systematic time management techniques; 4) establishing priority matrices helps students prioritize sports in busy schedules; 5) staggering class schedules reduces time conflicts and enhances sports accessibility; 6) creating micro-workout programs suits tight schedules with short,

high-efficiency exercises; 7) gamifying time allocation makes sports planning more engaging through goal-based reward systems.

6.How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate sponsorship programs secures resources for campus sports activities; 3) creating interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as achievement badges and leaderboards, enhances student motivation; 5) establishing alumni mentorship networks connects students with sports professionals; 6) developing club sustainability frameworks ensures long-term operation of sports clubs; 7) implementing club performance evaluations helps optimize activities and member involvement.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) establishing mental health counseling services supports students' psychological well-being through sports; 2) conducting stress management workshops teaches students to use sports as a stress-relief tool; 3) leveraging AI mental health tools provides personalized psychological support based on student data; 4) creating sports therapy programs combines physical activity with mental health rehabilitation; 5) developing stress-tracking apps allows students to monitor the impact of sports on their emotional state; 6) integrating sports into academic counseling helps students balance study and exercise for better focus.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops encourages joint participation and mutual support; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) developing digital family platforms facilitates real-time communication on sports habits; 5) integrating family health evaluations helps assess the impact of family support on

sports habits; 6) implementing equipment subsidy programs reduces financial barriers to sports resources; 7) creating family sports days fosters shared sports experiences among family members.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly assessing students' physical and mental health risks ensures safe and sustainable sports participation; 2) setting up a monitoring mechanism for sports facilities ensures their safe and proper usage; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) collecting and analyzing sports injury data helps identify trends and improve safety measures; 5) incorporating risk assessment into sports course design prioritizes student safety in curriculum planning; 6) conducting regular safety inspections of sports venues prevents equipment-related accidents; 7) using digital technology to monitor sports risks enables real-time tracking and emergency response; 8) providing regular training for PE teachers on risk management enhances their safety management capabilities.

10.How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures inclusive decision-making among all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize collaborative improvement areas; 5) establishing shared governance frameworks fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support for sports programs; 7) creating stakeholder-specific communication channels ensures targeted feedback and engagement; 8) launching collaborative training programs for faculty and student leaders enhances professional capabilities; 9) establishing joint research initiatives addresses practical barriers to sports participation.

Interviewer 10

1.How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of

undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is essential to overhaul the curriculum framework to embed innovative educational concepts; 2) revamping the teaching mode can enhance students' engagement in sports education; 3) optimizing the evaluation system helps improve the effectiveness of sports education; 4) integrating educational resources enables comprehensive utilization of teaching materials; 5) boosting digital empowerment assists in incorporating smart technology into sports curricula; 6) facilitating policy alignment is key to integrating sports education with national development strategies; 7) enhancing international integration allows the adoption of global best practices in sports education.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) redesigning campus spatial layout should focus on creating accessible and functional sports zones; 2) fostering a sports culture atmosphere can inspire sustainable participation through thematic campaigns; 3) enhancing facility accessibility ensures students can easily access sports equipment; 4) strengthening digital integration promotes intelligent management of campus sports facilities; 5) establishing feedback mechanisms allows continuous improvement of the sports environment; 6) creating inclusive spaces ensures equal sports opportunities for all students; 7) supporting a policy support framework provides institutional safeguards for campus sports development.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) developing interactive health curricula can deepen students' practical understanding of health and sports; 2) implementing health passports helps track long-term health progress and sports participation; 3) leveraging AI health coaches enables data-driven personalized health guidance; 4) integrating health into academic programs promotes a holistic approach to student well-being; 5) establishing peer health mentors fosters a culture of health awareness among students; 6) developing health literacy standards sets clear benchmarks for students' health cognition; 7) establishing health ambassador programs enhances peer-to-peer health promotion.

4. How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) formulating personalized habit plans caters to students' diverse lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their exercise routines in real time; 3) creating supportive environments, such as fitness-oriented dormitories, encourages daily physical activity; 4) integrating health into academic curricula ensures health concepts are embedded in daily teaching; 5) leveraging digital platforms provides convenient tools for managing sports schedules; 6) fostering social accountability through peer groups motivates consistent sports participation; 7) establishing sleep-friendly environments supports physical recovery for sustained sports performance; 8) promoting time management workshops helps students balance sports and academic schedules.

5. How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students efficiently balance academic and sports time; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) conducting time-blocking workshops teaches students systematic time management techniques; 4) establishing priority matrices helps students prioritize sports in busy schedules; 5) staggering class schedules reduces time conflicts and enhances sports accessibility; 6) creating micro-workout programs suits tight schedules with short, high-efficiency exercises; 7) gamifying time allocation makes sports planning more engaging through goal-based reward systems.

6. How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate sponsorship programs secures resources for campus sports activities; 3) creating interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as achievement badges and leaderboards, enhances student motivation; 5) establishing alumni

mentorship networks connects students with sports professionals; 6) developing club sustainability frameworks ensures long-term operation of sports clubs; 7) implementing club performance evaluations helps optimize activities and member involvement.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) integrating sports with mindfulness combines physical activity with mental relaxation; 2) establishing mental health counseling services supports students' psychological well-being through sports; 3) conducting stress management workshops teaches students to use sports as a stress-relief tool; 4) leveraging AI mental health tools provides personalized psychological support based on student data; 5) creating sports therapy programs combines physical activity with mental health rehabilitation; 6) developing stress-tracking apps allows students to monitor the impact of sports on their emotional state; 7) integrating sports into academic counseling helps students balance study and exercise for better focus.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops encourages joint participation and mutual support; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) developing digital family platforms facilitates real-time communication on sports habits; 5) integrating family health evaluations helps assess the impact of family support on sports habits; 6) implementing equipment subsidy programs reduces financial barriers to sports resources; 7) creating family sports days fosters shared sports experiences among family members; 8) organizing parent training programs enhances family literacy in sports support.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly assessing students' physical and mental health risks ensures safe and sustainable sports participation; 2) setting up a monitoring

mechanism for sports facilities ensures their safe and proper usage; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) collecting and analyzing sports injury data helps identify trends and improve safety measures; 5) incorporating risk assessment into sports course design prioritizes student safety in curriculum planning; 6) conducting regular safety inspections of sports venues prevents equipment-related accidents; 7) using digital technology to monitor sports risks enables real-time tracking and emergency response; 8) providing regular training for PE teachers on risk management enhances their safety management capabilities.

10. How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures inclusive decision-making among all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize collaborative improvement areas; 5) establishing shared governance frameworks fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support for sports programs; 7) creating stakeholder-specific communication channels ensures targeted feedback and engagement; 8) launching collaborative training programs for faculty and student leaders enhances professional capabilities; 9) establishing joint research initiatives addresses practical barriers to sports participation; 10) creating industry-academia partnerships drives innovation in sports technology and education.

Interviewer 11

1. How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is critical to revamp the curriculum system for integrating innovative educational concepts; 2) enhancing the teaching mode can boost students' engagement in sports education; 3) streamlining the evaluation system helps improve the effectiveness of sports education; 4) consolidating educational

resources enables comprehensive utilization of teaching materials; 5) reinforcing digital empowerment assists in embedding smart technology into sports curricula; 6) facilitating policy alignment is key to integrating sports education with national development strategies; 7) promoting international integration allows the adoption of global best practices in sports education.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) reconfiguring campus spatial layout should focus on creating accessible sports zones; 2) nurturing a sports culture atmosphere can inspire sustainable participation through thematic activities; 3) enhancing facility accessibility ensures students can easily access sports equipment; 4) strengthening digital integration promotes intelligent management of campus sports facilities; 5) establishing feedback mechanisms allows continuous improvement of the sports environment; 6) supporting a policy support framework provides institutional safeguards for campus sports development.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) developing interactive health curricula can deepen students' practical understanding of health and sports; 2) implementing health passports helps track long-term health progress and sports participation; 3) leveraging AI health coaches enables data-driven personalized health guidance; 4) integrating health into academic programs promotes a holistic approach to student well-being; 5) establishing peer health mentors fosters a culture of health awareness among students; 6) developing health literacy standards sets clear benchmarks for students' health cognition.

4.How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) formulating personalized habit plans caters to students' diverse lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their exercise routines in real time; 3) creating supportive environments, such as fitness-oriented dormitories, encourages daily physical activity; 4) integrating health into academic curricula ensures health

concepts are embedded in daily teaching; 5) leveraging digital platforms provides convenient tools for managing sports schedules; 6) fostering social accountability through peer groups motivates consistent sports participation; 7) establishing sleep-friendly environments supports physical recovery for sustained sports performance.

5. How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students efficiently balance academic and sports time; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) conducting time-blocking workshops teaches students systematic time management techniques; 4) establishing priority matrices helps students prioritize sports in busy schedules; 5) staggering class schedules reduces time conflicts and enhances sports accessibility; 6) creating micro-workout programs suits tight schedules with short, high-efficiency exercises; 7) gamifying time allocation makes sports planning more engaging through goal-based reward systems.

6. How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate sponsorship programs secures resources for campus sports activities; 3) creating interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as achievement badges and leaderboards, enhances student motivation; 5) establishing alumni mentorship networks connects students with sports professionals; 6) developing club sustainability frameworks ensures long-term operation of sports clubs; 7) implementing club performance evaluations helps optimize activities and member involvement.

7. How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) integrating sports with mindfulness combines physical activity with mental relaxation; 2) establishing mental health counseling services supports students' psychological well-being through sports; 3) conducting stress management workshops teaches students to use sports as a stress-relief tool; 4) leveraging AI mental health tools provides personalized psychological support based on student data; 5) creating sports therapy programs combines physical activity with mental health rehabilitation; 6) developing stress-tracking apps allows students to monitor the impact of sports on their emotional state.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops encourages joint participation and mutual support; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) developing digital family platforms facilitates real-time communication on sports habits; 5) integrating family health evaluations helps assess the impact of family support on sports habits; 6) implementing equipment subsidy programs reduces financial barriers to sports resources; 7) creating family sports days fosters shared sports experiences among family members.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly assessing students' physical and mental health risks ensures safe and sustainable sports participation; 2) setting up a monitoring mechanism for sports facilities ensures their safe and proper usage; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) collecting and analyzing sports injury data helps identify trends and improve safety measures; 5) incorporating risk assessment into sports course design prioritizes student safety in curriculum planning; 6) conducting regular safety inspections of sports venues prevents equipment-related accidents; 7) using digital technology to monitor sports risks enables real-time tracking and emergency response.

10.How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures inclusive decision-making among all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize collaborative improvement areas; 5) establishing shared governance frameworks fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support for sports programs.

Interviewer 12

1.How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is vital to restructure the curriculum system for integrating innovative educational concepts; 2) upgrading the teaching mode can enhance students' engagement in sports education; 3) optimizing the evaluation system helps improve the effectiveness of sports education; 4) integrating educational resources enables comprehensive utilization of teaching materials; 5) reinforcing digital empowerment assists in embedding smart technology into sports curricula; 6) promoting policy connection is key to aligning sports education with national development strategies; 7) enhancing international integration allows the adoption of global best practices in sports education.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) reconfiguring campus spatial layout should focus on creating accessible sports zones; 2) cultivating a sports culture atmosphere can inspire sustainable participation through thematic campaigns; 3) enhancing facility accessibility ensures students can easily access sports equipment; 4) strengthening digital integration promotes intelligent management of campus sports facilities; 5) establishing feedback mechanisms allows continuous improvement of the sports environment; 6) creating inclusive spaces ensures equal sports opportunities for

all students; 7) supporting a policy support framework provides institutional safeguards for campus sports development.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) designing interactive health curricula can deepen students' practical understanding of health and sports; 2) implementing health passports helps track long-term health progress and sports participation; 3) leveraging AI health coaches enables data-driven personalized health guidance; 4) integrating health into academic programs promotes a holistic approach to student well-being; 5) establishing peer health mentors fosters a culture of health awareness among students; 6) developing health literacy standards sets clear benchmarks for students' health cognition; 7) establishing health ambassador programs enhances peer-to-peer health promotion.

4.How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) formulating personalized habit plans caters to students' diverse lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their exercise routines in real time; 3) creating supportive environments, such as fitness-oriented dormitories, encourages daily physical activity; 4) integrating health into academic curricula ensures health concepts are embedded in daily teaching; 5) leveraging digital platforms provides convenient tools for managing sports schedules; 6) fostering social accountability through peer groups motivates consistent sports participation; 7) establishing sleep-friendly environments supports physical recovery for sustained sports performance.

5.How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students efficiently balance academic and sports time; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) conducting time-blocking workshops teaches students systematic time management techniques; 4) establishing priority matrices helps students prioritize sports in busy schedules; 5)

staggering class schedules reduces time conflicts and enhances sports accessibility; 6) creating micro-workout programs suits tight schedules with short, high-efficiency exercises; 7) gamifying time allocation makes sports planning more engaging through goal-based reward systems.

6.How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate sponsorship programs secures resources for campus sports activities; 3) creating interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as achievement badges and leaderboards, enhances student motivation; 5) establishing alumni mentorship networks connects students with sports professionals; 6) developing club sustainability frameworks ensures long-term operation of sports clubs; 7) implementing club performance evaluations helps optimize activities and member involvement.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) integrating sports with mindfulness combines physical activity with mental relaxation; 2) establishing mental health counseling services supports students' psychological well-being through sports; 3) conducting stress management workshops teaches students to use sports as a stress-relief tool; 4) leveraging AI mental health tools provides personalized psychological support based on student data; 5) creating sports therapy programs combines physical activity with mental health rehabilitation; 6) developing stress-tracking apps allows students to monitor the impact of sports on their emotional state; 7) integrating sports into academic counseling helps students balance study and exercise for better focus.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops

encourages joint participation and mutual support; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) developing digital family platforms facilitates real-time communication on sports habits; 5) integrating family health evaluations helps assess the impact of family support on sports habits; 6) implementing equipment subsidy programs reduces financial barriers to sports resources; 7) creating family sports days fosters shared sports experiences among family members; 8) organizing parent training programs enhances family literacy in sports support.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly assessing students' physical and mental health risks ensures safe and sustainable sports participation; 2) setting up a monitoring mechanism for sports facilities ensures their safe and proper usage; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) collecting and analyzing sports injury data helps identify trends and improve safety measures; 5) incorporating risk assessment into sports course design prioritizes student safety in curriculum planning; 6) conducting regular safety inspections of sports venues prevents equipment-related accidents; 7) using digital technology to monitor sports risks enables real-time tracking and emergency response; 8) providing regular training for PE teachers on risk management enhances their safety management capabilities.

10.How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures inclusive decision-making among all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize collaborative improvement areas; 5) establishing shared governance frameworks fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support for sports programs; 7) creating stakeholder-specific communication channels ensures targeted feedback and engagement; 8) launching collaborative training programs for faculty and student leaders enhances professional capabilities; 9) establishing

joint research initiatives addresses practical barriers to sports participation; 10) creating industry-academia partnerships drives innovation in sports technology and education.

Interviewer 13

1.How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is crucial to revamp the curriculum framework to integrate innovative educational concepts; 2) upgrading the teaching mode can boost students' engagement in sports education; 3) optimizing the evaluation system helps enhance the effectiveness of sports education; 4) integrating educational resources enables comprehensive utilization of teaching materials; 5) strengthening digital empowerment assists in embedding smart technology into sports curricula; 6) promoting policy connection is key to aligning sports education with national development strategies.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) optimizing campus spatial layout should focus on creating accessible and functional sports zones; 2) cultivating a sports culture atmosphere can inspire sustainable participation through thematic activities; 3) enhancing facility accessibility ensures students can easily utilize sports equipment; 4) strengthening digital integration promotes intelligent management of campus sports facilities; 5) establishing feedback mechanisms allows continuous improvement of the sports environment; 6) creating inclusive spaces ensures equal sports opportunities for all students; 7) supporting a policy support framework provides institutional safeguards for campus sports development.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) developing interactive health curricula can deepen students' practical understanding of health and sports; 2) implementing health passports helps track long-term health progress and sports participation; 3) leveraging AI health coaches enables data-driven personalized health guidance; 4) integrating health into academic programs promotes a holistic approach to student well-being; 5) establishing peer health mentors fosters a culture of health awareness among students.

4.How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) formulating personalized habit plans caters to students' diverse lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their exercise routines in real time; 3) creating supportive environments, such as fitness-oriented dormitories, encourages daily physical activity; 4) integrating health into academic curricula ensures health concepts are embedded in daily teaching.

5.How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students efficiently balance academic and sports time; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) conducting time-blocking workshops teaches students systematic time management techniques; 4) establishing priority matrices helps students prioritize sports in busy schedules; 5) staggering class schedules reduces time conflicts and enhances sports accessibility; 6) creating micro-workout programs suits tight schedules with short, high-efficiency exercises; 7) gamifying time allocation makes sports planning more engaging through goal-based reward systems.

6.How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate sponsorship programs secures resources for campus sports activities; 3) creating interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as achievement badges and leaderboards, enhances student motivation; 5) establishing alumni mentorship networks connects students with sports professionals; 6) developing club sustainability frameworks ensures long-term operation of sports clubs; 7) implementing club performance evaluations helps optimize activities and member involvement.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) integrating sports with mindfulness combines physical activity with mental relaxation; 2) establishing mental health counseling services supports students' psychological well-being through sports.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops encourages joint participation and mutual support; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) developing digital family platforms facilitates real-time communication on sports habits; 5) integrating family health evaluations helps assess the impact of family support on sports habits; 6) implementing equipment subsidy programs reduces financial barriers to sports resources; 7) creating family sports days fosters shared sports experiences among family members; 8) establishing family counseling services addresses psychological barriers to sports participation.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly assessing students' physical and mental health risks ensures safe and sustainable sports participation; 2) setting up a monitoring mechanism for sports facilities ensures their safe and proper usage; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) collecting and analyzing sports injury data helps identify trends and improve safety measures; 5) incorporating risk assessment into sports course design prioritizes student safety in curriculum planning; 6) conducting regular safety inspections of sports venues prevents equipment-related accidents; 7) using digital technology to monitor sports risks enables real-time tracking and emergency response; 8) providing regular training for PE teachers on risk management enhances their safety management capabilities.

10.How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures inclusive decision-making among all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize collaborative improvement areas; 5) establishing shared governance frameworks fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support for sports programs; 7) creating stakeholder-specific communication channels ensures targeted feedback and engagement; 8) launching collaborative training programs for faculty and student leaders enhances professional capabilities; 9) establishing joint research initiatives addresses practical barriers to sports participation; 10) creating industry-academia partnerships drives innovation in sports technology and education.

Interviewer 14

1.How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is essential to overhaul the curriculum system to embed innovative educational concepts; 2) revamping the teaching mode can enhance students' engagement in sports education; 3) optimizing the evaluation system helps improve the effectiveness of sports education; 4) integrating educational resources enables comprehensive utilization of teaching materials; 5) enhancing digital empowerment assists in incorporating smart technology into sports curricula; 6) promoting policy connection is key to aligning sports education with national development strategies; 7) enhancing international integration allows the adoption of global best practices in sports education.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) redesigning campus spatial layout should focus on creating accessible sports zones; 2) fostering a sports culture atmosphere can inspire sustainable participation through thematic campaigns; 3) enhancing facility accessibility ensures students can easily access sports equipment; 4) strengthening digital integration promotes intelligent management of campus sports facilities; 5) establishing feedback mechanisms allows continuous improvement of the sports environment.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) developing interactive health curricula can deepen students' practical understanding of health and sports; 2) implementing health passports helps track long-term health progress and sports participation; 3) leveraging AI health coaches enables data-driven personalized health guidance; 4) integrating

health into academic programs promotes a holistic approach to student well-being.

4.How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) formulating personalized habit plans caters to students' diverse lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their exercise routines in real time; 3) creating supportive environments, such as fitness-oriented dormitories, encourages daily physical activity; 4) integrating health into academic curricula ensures health concepts are embedded in daily teaching; 5) leveraging digital platforms provides convenient tools for managing sports schedules; 6) fostering social accountability through peer groups motivates consistent sports participation; 7) establishing sleep-friendly environments supports physical recovery for sustained sports performance; 8) promoting healthy diet guidance combines diet with sports for better results.

5.How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students efficiently balance academic and sports time; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) conducting time-blocking workshops teaches students systematic time management techniques; 4) establishing priority matrices helps students prioritize sports in busy schedules; 5) staggering class schedules reduces time conflicts and enhances sports accessibility; 6) creating micro-workout programs suits tight schedules with short, high-efficiency exercises; 7) gamifying time allocation makes sports planning more engaging through goal-based reward systems.

6.How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate sponsorship programs secures resources for campus sports activities; 3) creating interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as achievement badges and leaderboards, enhances student motivation; 5) establishing alumni mentorship networks connects students with sports professionals; 6) developing club sustainability frameworks ensures long-term operation of sports clubs; 7) implementing club performance evaluations helps optimize activities and member involvement; 8) organizing inter-school club exchanges expands students' sports horizons.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) integrating sports with mindfulness combines physical activity with mental relaxation; 2) establishing mental health counseling services supports students' psychological well-being through sports; 3) conducting stress management workshops teaches students to use sports as a stress-relief tool; 4) leveraging AI mental health tools provides personalized psychological support based on student data; 5) creating sports therapy programs combines physical activity with mental health rehabilitation; 6) developing stress-tracking apps allows students to monitor the impact of sports on their emotional state; 7) integrating sports into academic counseling helps students balance study and exercise for better focus.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops encourages joint participation and mutual support; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) developing

digital family platforms facilitates real-time communication on sports habits; 5) integrating family health evaluations helps assess the impact of family support on sports habits; 6) implementing equipment subsidy programs reduces financial barriers to sports resources; 7) creating family sports days fosters shared sports experiences among family members; 8) organizing parent sports competitions enhances family participation in sports.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly assessing students' physical and mental health risks ensures safe and sustainable sports participation; 2) setting up a monitoring mechanism for sports facilities ensures their safe and proper usage; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) collecting and analyzing sports injury data helps identify trends and improve safety measures; 5) incorporating risk assessment into sports course design prioritizes student safety in curriculum planning; 6) conducting regular safety inspections of sports venues prevents equipment-related accidents.

10.How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures inclusive decision-making among all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize collaborative improvement areas; 5) establishing shared governance frameworks fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support for sports program.

Interviewer 15

1.How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is critical to revamp the curriculum system for integrating innovative educational concepts; 2) enhancing the teaching mode can boost students' engagement in sports education; 3) streamlining the evaluation system helps improve the effectiveness of sports education; 4) consolidating educational resources enables comprehensive utilization of teaching materials; 5) reinforcing digital empowerment assists in embedding smart technology into sports curricula; 6) facilitating policy alignment is key to integrating sports education with national development strategies; 7) promoting international integration allows the adoption of global best practices in sports education; 8) organizing sports knowledge contests stimulates students' interest in sports learning.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) reconfiguring campus spatial layout should focus on creating accessible sports zones; 2) nurturing a sports culture atmosphere can inspire sustainable participation through thematic activities; 3) enhancing facility accessibility ensures students can easily access sports equipment; 4) strengthening digital integration promotes intelligent management of campus sports facilities; 5) establishing feedback mechanisms allows continuous improvement of the sports environment; 6) supporting a policy support framework provides institutional safeguards for campus sports development; 7) adding more sports facilities meets the diverse needs of students.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) developing interactive health curricula can deepen students' practical understanding of health and sports; 2) implementing health passports helps track long-term health progress and sports participation; 3) leveraging AI health coaches enables data-driven personalized health guidance; 4) integrating health into academic programs promotes a holistic approach to student well-being; 5) establishing peer health mentors fosters a culture of health awareness among students; 6) developing health literacy standards sets clear benchmarks for students' health cognition; 7) producing health education videos makes health knowledge more vivid and easy to understand.

4.How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) formulating personalized habit plans caters to students' diverse lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their exercise routines in real time; 3) creating supportive environments, such as fitness-oriented dormitories, encourages daily physical activity.

5.How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students efficiently balance academic and sports time; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) conducting time-blocking workshops teaches students systematic time management techniques; 4) establishing priority matrices helps students prioritize sports in busy schedules;

6.How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate sponsorship programs secures resources for campus sports activities; 3) creating

interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as achievement badges and leaderboards, enhances student motivation; 5) establishing alumni mentorship networks connects students with sports professionals; 6) developing club sustainability frameworks ensures long-term operation of sports clubs; 7) implementing club performance evaluations helps optimize activities and member involvement; 8) providing club leaders with training improves their organizational capabilities.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) integrating sports with mindfulness combines physical activity with mental relaxation; 2) establishing mental health counseling services supports students' psychological well-being through sports; 3) conducting stress management workshops teaches students to use sports as a stress-relief tool; 4) leveraging AI mental health tools provides personalized psychological support based on student data; 5) creating sports therapy programs combines physical activity with mental health rehabilitation; 6) organizing sports-themed psychological group activities enhances students' mental resilience; 7) developing stress-tracking apps allows students to monitor the impact of sports on their emotional state.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops encourages joint participation and mutual support; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) developing digital family platforms facilitates real-time communication on sports habits; 5) integrating family health evaluations helps assess the impact of family support on sports habits; 6) sending sports activity feedback to families keeps them informed

of students' participation; 7) creating family sports days fosters shared sports experiences among family members; 8) establishing family counseling services addresses psychological barriers to sports participation.

9.How to detect and address the potential issues in formulating educational management strategies aiming to enhance the sustainable sports participation of undergraduate students?

I think: 1) regularly assessing students' physical and mental health risks ensures safe and sustainable sports participation; 2) setting up a monitoring mechanism for sports facilities ensures their safe and proper usage; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) collecting and analyzing sports injury data helps identify trends and improve safety measures; 5) organizing emergency drills for sports accidents enhances students' emergency response capabilities; 6) conducting regular safety inspections of sports venues prevents equipment-related accidents; 7) using digital technology to monitor sports risks enables real-time tracking and emergency response; 8) providing regular training for PE teachers on risk management enhances their safety management capabilities.

10.How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures inclusive decision-making among all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize collaborative improvement areas; 5) establishing shared governance frameworks fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support for sports programs.

Interviewer 16

1.How to analyze the strengths in the education and knowledge dimension that currently enhance the sustainable sports participation of undergraduate students, and how can these strengths be utilized in formulating health educational management strategies?

I think: 1) it is crucial to revamp the curriculum framework to embed innovative educational concepts; 2) upgrading the teaching mode can boost students' engagement in sports education; 3) optimizing the evaluation system helps enhance the effectiveness of sports education; 4) integrating educational resources enables comprehensive utilization of teaching materials; 5) strengthening digital empowerment assists in embedding smart technology into sports curricula; 6) promoting policy connection is key to aligning sports education with national development strategies; 7) enhancing international exchange allows the adoption of global advanced sports education concepts; 8) developing sports-related MOOCs expands students' access to sports knowledge.

2.How to identify the weaknesses in the campus environment dimension that affect the sustainable sports participation of undergraduate students, and what improvements can be made in the strategy - making process?

I think: 1) optimizing campus spatial layout should focus on creating accessible and functional sports zones; 2) cultivating a sports culture atmosphere can inspire sustainable participation through thematic activities; 3) enhancing facility accessibility ensures students can easily utilize sports equipment; 4) strengthening digital integration promotes intelligent management of campus sports facilities; 5) establishing feedback mechanisms allows continuous improvement of the sports environment; 6) creating inclusive spaces ensures equal sports opportunities for all students; 7) supporting a policy support framework provides institutional safeguards for campus sports development; 8) improving lighting and ventilation in sports venues enhances the sports experience.

3.How to assess the threats in the health and awareness dimension to the sustainable sports participation of undergraduate students, and how to address them in the strategy - making for educational management?

I think: 1) developing interactive health curricula can deepen students' practical understanding of health and sports; 2) implementing health passports helps track long-term health progress and sports participation; 3) leveraging AI health coaches enables data-driven personalized health guidance; 4) integrating health into academic programs promotes a holistic approach to student well-being.

4.How to explore the opportunities in the living habits dimension for promoting the sustainable sports participation of undergraduate students, and how can they be incorporated into the strategy - making?

I think: 1) formulating personalized habit plans caters to students' diverse lifestyles for sustainable sports habits; 2) implementing habit-tracking systems helps students monitor and adjust their exercise routines in real time; 3) creating supportive environments, such as fitness-oriented dormitories, encourages daily physical activity; 4) integrating health into academic curricula ensures health concepts are embedded in daily teaching; 5) leveraging digital platforms provides convenient tools for managing sports schedules; 6) fostering social accountability through peer groups motivates consistent sports participation.

5.How to evaluate the strengths and weaknesses in the time - management dimension regarding the sustainable sports participation of undergraduate students, and how to adjust the educational management strategy accordingly?

I think: 1) developing smart scheduling tools helps students efficiently balance academic and sports time; 2) integrating sports into curricula ensures regular physical activity becomes an academic requirement; 3) conducting time-blocking workshops teaches students systematic time management techniques; 4) establishing priority matrices helps students prioritize sports in busy schedules; 5) staggering class schedules reduces time conflicts and enhances sports accessibility; 6) creating micro-workout programs suits tight schedules with short, high-efficiency exercises; 7) gamifying time allocation makes sports planning more

engaging through goal-based reward systems; 8) setting up flexible sports activity time slots caters to different students' schedules.

6.How to analyze the threats and opportunities in the incentive and club dimension for the sustainable sports participation of undergraduate students, and how to design strategies to make the most of them?

I think: 1) implementing tiered reward systems motivates students at different levels to sustain sports participation; 2) developing corporate sponsorship programs secures resources for campus sports activities; 3) creating interdisciplinary sports leagues fosters collaborative and diverse sports engagement; 4) integrating gamification elements, such as achievement badges and leaderboards, enhances student motivation; 5) establishing alumni mentorship networks connects students with sports professionals; 6) developing club sustainability frameworks ensures long-term operation of sports clubs; 7) implementing club performance evaluations helps optimize activities and member involvement; 8) supporting the establishment of new sports clubs meets diverse sports interests.

7.How to identify the strengths and weaknesses in the psychological and stress dimension that affect the sustainable sports participation of undergraduate students, and how to optimize the educational management strategy?

I think: 1) integrating sports with mindfulness combines physical activity with mental relaxation; 2) establishing mental health counseling services supports students' psychological well-being through sports; 3) conducting stress management workshops teaches students to use sports as a stress-relief tool; 4) leveraging AI mental health tools provides personalized psychological support based on student data; 5) creating sports therapy programs combines physical activity with mental health rehabilitation; 6) developing stress-tracking apps allows students to monitor the impact of sports on their emotional state; 7) integrating sports into academic counseling helps students balance study and exercise for better focus.

8.How to assess the threats and opportunities in the family influence dimension for the sustainable sports participation of undergraduate students, and how to integrate family factors into the strategy - making?

I think: 1) establishing school-family partnerships builds a collaborative network to promote students' sports habits; 2) launching family sports workshops encourages joint participation and mutual support; 3) implementing family sports contracts formalizes commitments to sustained sports engagement; 4) developing digital family platforms facilitates real-time communication on sports habits; 5) integrating family health evaluations helps assess the impact of family support on sports habits.

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I think: 1) regularly assessing students' physical and mental health risks ensures safe and sustainable sports participation; 2) setting up a monitoring mechanism for sports facilities ensures their safe and proper usage; 3) establishing an early warning system for sports risks allows timely intervention in potential hazards; 4) collecting and analyzing sports injury data helps identify trends and improve safety measures; 5) incorporating risk assessment into sports course design prioritizes student safety in curriculum planning.

10.How to recognize the significance of SWOT and TOWS analysis in formulating strategies for promoting sustainable sports participation among undergraduate students?

I think: 1) establishing bi-annual stakeholder summits gathers diverse perspectives to refine sports strategies; 2) developing joint strategic planning committees ensures inclusive decision-making among all interest groups; 3) creating cross-sector partnerships with sports organizations expands resources and expertise; 4) conducting annual stakeholder needs assessments helps prioritize collaborative improvement areas; 5) establishing shared governance frameworks fosters transparent decision-making in sports initiatives; 6) developing joint funding schemes with multiple donors secures long-term financial support for sports programs; 7) creating stakeholder-specific communication channels ensures

targeted feedback and engagement; 8) launching collaborative training programs for faculty and student leaders enhances professional capabilities; 9) establishing joint research initiatives addresses practical barriers to sports participation; 10) evaluating strategy effectiveness regularly based on SWOT analysis and promotes continuous optimization.

Appendix E

Certificate of English



This is to certify that

Mrs. Yang Xiaodan

Achieved BSRU English Proficiency Test (BSRU-TEP) level

C2

Given on 15th August 2025

A handwritten signature in blue ink, appearing to read 'ksAs', is positioned above the name of the Assistant Professor.

Assistant Professor Dr Kulsirin Aphiratvoradej,

Director

Appendix F

The Document for Acceptance Research

**The Editorial Board of Higher Education Studies
Canadian Center of Science and Education**

1595 Sixteenth Ave, Suite 301, Richmond Hill, Ontario, L4B 3N9, Canada

Tel: 1-416-642-2606

Fax: 1-416-642-2608

E-mail: hes@ccsenet.org

Website: www.ccsenet.org

July 21, 2025

Dear Yang Xiaodan,

Thanks for your submission to *Higher Education Studies*.

We have the pleasure to inform you that your manuscript has been accepted for publication. It will be published in the issue of Vol. 15, No. 3, in September 2025.

Title: Good Health Educational Management Strategies for Enhancing Sustainable Sports Participation of College Students

Authors: Xiaodan Yang, Phatchareephorn Bangkheow, Chollada Pongpattanayothin, Phisanu Bangkheow

If you have any questions, please do not hesitate to contact with us.

Sincerely,

Sherry Lin



On behalf of,
The Editorial Board of *Higher Education Studies*
Canadian Center of Science and Education

Good Health Educational Management Strategies for Enhancing Sustainable Sports Participation of College Students

Yang Xiaodan^{1,2}, Phatchareeporn Bangkheow¹, Chollada Pongpattanayothin¹, Phisanu Bangkheow¹

¹ Graduate School, Bansomdejchaopraya Rajabhat University, Bangkok, Thailand

² Department of Physical Education, Haojing College of Shaanxi University of Science and Technology, Shaanxi, China

Correspondence: Yang Xiaodan, Graduate School, Bansomdejchaopraya Rajabhat University, Bangkok 10600, Thailand. Tel: 064-018-0286 E-mail: sjyangxiaodan@126.com

Abstract

This study aims to (i) explore the current situation, desirable situation, and supporting factors for college students' sustainable sports participation, (ii) develop health educational management strategies to enhance college students' sustainable sports participation, and (iii) evaluate the adaptability and feasibility of these strategies. A total of 384 students, 16 teachers and education administrators, 12 experts for focus group discussion, and 5 experts for strategy evaluation were selected as the sample. The students were sampled via stratified sampling, while the others were chosen by purposive sampling. The research instruments included questionnaires, interviews, SWOT and TOWS matrices, and a five - level scoring table. Data were analyzed using percentages, mean, standard deviations, Modified Priority Needs Index, and content analysis. The results indicate that all eight dimensions of college students' sports participation require improvement. The developed strategies encompass a vision for cultivating a sports participation culture, a mission for providing high - quality physical education, specific goals for increasing the sports participation rate, and a series of strategic measures related to education and knowledge system innovation and campus environment optimization. The evaluation of the adaptability and feasibility of the strategies achieved high and the highest levels, respectively.

Keywords: Good health educational management strategies, Sustainable sports, participation, College students

1. Introduction

1.1 Dilemmas of College Students' Sustainable Sports Participation and Research Motivation

Education is of utmost significance for the all - round development of individuals and society, with physical education and sports participation being an essential part of the comprehensive education system. In China, the government has issued a series of policies to promote the physical health of adolescents and college students, such as the "Opinions on Strengthening Adolescent Sports and Enhancing Adolescent Physical Fitness" in 2007 and the "Opinions on Comprehensively Strengthening and Improving School Sports Work in the New Era" in 2021. However, college students still face numerous challenges in maintaining sustainable sports participation. Academic pressure, insufficient facilities, lack of peer motivation, mental health problems like anxiety and depression, economic factors, and cognitive biases about the value of sports all act as barriers. For example, high costs of sports equipment and gym membership fees prevent students with poor economic conditions from participating, and students with psychological problems often lack the motivation to engage in sports. This research was conducted to answer the research questions as follows:

- 1) What is the current situation ,desirable situation, that enhance sustainable sports participation of college students?
- 2) What are the good health educational management strategies for enhancing sustainable sports participation of college students?

3) What are the level of adaptability and feasibility of the good health educational management strategies for enhancing sustainable sports participation of college students?

1.2 Multidimensional Values of Enhancing College Students' Sports Participation

Enhancing college students' sports participation is closely related to personal health, public health improvement, and the achievement of Sustainable Development Goal 3 (SDG 3). Regular sports participation can reduce the risk of non - communicable diseases such as obesity, heart disease, and diabetes, and also improve mental health, reduce stress, and promote social cohesion. From an educational perspective, it helps students achieve better academic performance, develop teamwork spirit, and improve stress - resistance ability. For schools, a positive sports culture atmosphere can enhance the school's reputation, attract high - quality students, and improve the school's competitiveness. In the context of global education development, enhancing college students' sustainable sports participation is in line with the trend of comprehensive education.

1.3 Literature Review on College Students' Sports Participation

Previous studies have explored various aspects of college students' sports participation. Cai (2022) revealed that college students' mental health issues significantly undermine their willingness to engage in sports activities. Kim and Jeong (2024) indicated that economic constraints and inadequate time management skills are major factors leading college students to abandon sports. Luo et al. (2010) discovered that Chinese college students harbor cognitive biases towards sports, and the absence of peer encouragement and a vibrant campus sports culture also impede their participation. Xu (2024) emphasized that academic pressure, coupled with insufficient school sports facilities and limited social support, are key barriers to Chinese college students' sports participation.

The World Health Organization (WHO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) have long advocated enhancing physical activity among young people as a means to prevent non - communicable diseases and enhance mental health. Collectively, these findings lay a theoretical foundation for understanding the influencing factors of college students' sports participation and formulating targeted strategies.

1.4 The Problem of College Students' Sustainable Sports Participation and Its Alignment with Research Design

The current sustainable sports participation among college students faces multiple challenges such as academic pressure, insufficient facilities, and psychological problems. Although policy support continues to increase, existing strategies lack systematicness. Based on this, this study proposes three aspects of questions: (a) Exploring the current status and ideal state of college students' sustainable sports participation: Starting from eight dimensions including educational knowledge, data are collected through stratified sampling questionnaire surveys and interviews. (b) Developing health management education strategies: Using SWOT-TOWS matrix analysis combined with expert focus group discussions to generate 10 strategies. (c) Evaluating the adaptability and feasibility of strategies: Inviting experts to conduct quantitative analysis through the Likert scale.

The research design integrates multiple dimensions, innovates tools, and fuses methodologies to form a complete closed-loop from problem diagnosis to solution verification, providing theoretical and practical references for enhancing college students' sustainable sports participation.

2. Method

This study employs a mixed-methods research design, which integrates quantitative and qualitative approaches to develop a holistic understanding of the factors influencing sustained sports participation among college students. The quantitative component involves survey-based data collection to measure current participation levels and related variables, while the qualitative component utilizes in-depth interviews to explore students' motivations, barriers, and context-specific experiences. This design ensures both breadth and depth of data, supporting the triangulation of findings and enhancing the validity of results.

2.1 Study Population and Sampling

As per the Ministry of Education of China's data on June 20, 2024, the total population under study consists of 47.63 million college students enrolled in 1,308 undergraduate institutions across China. This vast population forms the basis for understanding the diverse landscape of college students' sports participation.

The sample size for this study was determined using the provided sample size formula (Krejcie & Morgan, 1970). 1) Phase 1 (Exploratory Research): Stratified sampling was used to select 384 students from 10 universities representing diverse geographic and institutional profiles. Purposive sampling recruited 16 physical education teachers and educational administrators with at least five years of experience in college sports management.

2) Phase 2 (Strategy Development): Twelve key informants - including directors of university sports departments and senior administrators with over 10 years of expertise in college sports policy - were purposively selected to participate in focus group discussions.

3) Phase 3 (Strategy Evaluation): Five senior academic leaders from China and Thailand (holding doctoral degrees, associate professor or higher ranks, and ≥ 10 years of university management experience) were recruited via purposive sampling to evaluate strategy adaptability and feasibility.

2.2 Research Instruments

This study utilized diverse research instruments across three phases, each undergoing strict quality testing to ensure reliability and validity. The details are as follows:

1) Questionnaire Survey: The structured questionnaire was developed by referencing domestic and international literature, integrating theoretical frameworks such as Maslow's hierarchy of needs theory and self-determination theory. It comprised four sections: personal information, current sports participation status, influencing factors, and motivation/obstacle assessment via a 5-point Likert scale. For quality testing: (a) Validity was evaluated by five experts using the Index of Objective Congruence (IOC), yielding values of 0.67–1.00, indicating high content validity; (b) Reliability was tested through a pilot survey with 30 students, using Cronbach's Alpha coefficient. The result met the "good reliability" standard (0.8–0.9), targeting a coefficient of 0.85.

2) Interview Forms: (a) Structured interview outlines were designed to explore deep-seated factors affecting sports participation, targeting 16 physical education teachers and administrators. (b) Focus group discussions involved 12 key informants (sports department directors/deputy directors) to develop management strategies. Quality assurance included: Review and revision of interview content by the thesis supervisor and three experts to ensure relevance; Adherence to principles of sincerity, voluntariness, and confidentiality to enhance data authenticity.

3) Evaluation Form: The evaluation form, using a 5-point Likert scale, assessed strategy adaptability and feasibility. It adopted Rensis Likert's average value interpretation standard for scoring validity. Five senior administrators with doctoral degrees, over 10 years of management experience, and expertise in educational management/physical education were selected via purposive sampling to ensure evaluation authority.

4) Literature Research: Academic literature on college students' sports participation, educational management theories, and strategy evaluation was systematically reviewed. Quality control involved restricting sources to peer-reviewed journals and authoritative publications to ensure theoretical rigor and relevance.

2.3 Data Collection

The data collection process was systematically implemented across three phases, integrating rigorous operational details and quality control measures. The optimized descriptions are as follows:

1) Phase 1: (a) Questionnaire Administration: Data collection was approved by the Graduate School of Bansomdejchaopraya Rajabhat University, with electronic surveys distributed to students via institutional platforms, targeting a 100% response rate. (b) Interviews: T30–45-minute audio-recorded sessions were conducted with 16 educators, transcribed verbatim, and cross-checked for accuracy.

2) Phase 2: Focus groups were moderated by the primary investigator, with participants provided pre-read materials to contextualize discussions on strategy development.

3) Phase 3: Evaluation forms were disseminated to experts via university channels, with follow-up reminders to ensure a complete response set.

2.4 Data Analysis

The data analysis process was systematically structured across three phases, integrating quantitative, qualitative, and mixed-method approaches to ensure scientific rigor. The optimized descriptions are as follows:

1) Quantitative Analysis (Phase 1): (a) Descriptive statistics (frequencies, means, standard deviations) were used computer program calculations to characterize participant demographics and participation trends. (b) SWOT analysis was employed to map internal strengths/weaknesses (e.g., campus facilities, academic workload) and external opportunities/threats (e.g., policy support, societal attitudes toward sports).

2) Qualitative Analysis: (a) Thematic analysis of interview data (Phases 1–2) was conducted using NVivo, identifying recurring themes related to motivation, barriers, and strategy priorities. (b) TOWS matrix analysis (Phase 1) translated SWOT findings into actionable strategies (SO: leverage strengths to seize opportunities; WT: mitigate weaknesses and threats).

3) Strategy Evaluation (Phase 3): Descriptive statistics were used to aggregate feasibility scores, with mean values guiding iterative refinement of the intervention framework.

This multi-phase methodology ensured rigorous integration of empirical data and stakeholder expertise, providing a robust foundation for evidence-based strategies to enhance college students' sustainable sports engagement.

3. Results

This research focuses on enhancing the sustainable sports participation of college students. It encompasses three main aspects: exploring the current and expected situations of college students' sustainable sports participation, developing strategies to promote such participation, and evaluating the adaptability and feasibility of these strategies. The research samples include 384 college students and 16 teachers and education administrators, and stratified sampling and questionnaire survey methods are employed.

3.1 Analysis of current situation and desirable situation of sports participation of college students

The questionnaire data was processed using frequency analysis, percentage analysis, and descriptive statistics to present the current and expected situations of college students' sustainable sports participation from eight dimensions. The current situation, based on the mean of all eight dimensions, was at a moderate level ($\bar{X}=0.41$, $S.D.=0.69$). The dimensions with higher current - situation means were the Psychology and Stress Dimension ($\bar{X}=3.66$, $S.D.=0.60$), Campus Environment Dimension ($\bar{X}=3.64$, $S.D.=0.61$), and Living Habits Dimension ($\bar{X}=3.63$, $S.D.=0.64$). The expected situations were generally at a high level ($\bar{X}=4.45$, $S.D.=0.73$). There were gaps between the current and expected situations in all dimensions, with the Incentive and Club Dimension having the largest gap ($PNI=0.53$), indicating significant room for improvement in enhancing college students' sustainable sports participation.

Table 1. Analysis of current situation and desirable situation of sports participation of college students.
($n=384$)

Sustainable Sports participation	Current situation		Desirable situation		PNImodified (I – D)/D	Rank
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
1.Educational and Knowledge Dimension	3.11	0.71	4.48	0.70	0.46	2
2.Campus Environment Dimension	3.64	0.61	4.41	0.79	0.21	7
3.Health and Awareness Dimension	3.55	0.68	4.47	0.70	0.27	5
4.Living Habits Dimension	3.63	0.64	4.42	0.76	0.22	6
5.Time Management Dimension	3.47	0.71	4.45	0.74	0.29	4
6.Incentive and Club Dimension	3.05	0.71	4.60	0.61	0.53	1
7.Psychology and Stress Dimension	3.66	0.60	4.35	0.81	0.19	8
8.Family Influence Dimension	3.17	0.86	4.44	0.76	0.41	3
Total	3.41	0.69	4.45	0.73	0.32	

3.2 SWOT Analysis and TOWS Matrix Analysis to develop the good health educational management strategies

The researchers classified and summarized suggestions from 16 interviewees on ten questions, noting both consensus and differences. Interviewees provided strategic insights on SWOT factors (strengths, weaknesses, opportunities, threats) affecting college students' sports and health education.

SWOT analysis identified internal strengths including educational infrastructure, student-family awareness, and school management; weaknesses such as low educational quality, poor engagement, lifestyle barriers, and psychological hurdles; external opportunities like social-tech advancements, mental health support, and family-focused initiatives; and threats including academic time constraints, policy gaps, cost competition, and knowledge gaps. Key takeaways highlighted strong policy support as a core strength and educational quality issues as a major weakness. Corresponding TOWS matrix strategies were developed: leveraging policy support and digital tools to enhance course practicality (SO), using policy backing to safeguard sports time against academic pressures (ST), collaborating to address educational quality shortcomings (WT), and capitalizing on AI mental health tools to transform educational weaknesses into improvement opportunities (WO).

In conclusion, by integrating the SWOT and TOWS analyses, a comprehensive strategy was formulated to enhance college students' sustainable sports participation. This integrated approach considered both internal and external factors, aiming to create a more conducive environment for college students to engage in long - term sports activities.

Table 2. Results of SWOT and TOWS Matrix

S	W
S1: Sound knowledge system and qualified education staff. S2: The ed system has basic sports knowledge and related resources. S3: Some students see health-sports link, and schools have basic health management. S4: Some students know lifestyle-exercise link, and campuses have healthy facilities. S5: Students have exercise-related time management skills, and daily routines can be adjusted. S6: There's a sports incentive mechanism (low-impact) and basic sports club access. S7: College students know exercise relieves stress and have some mental-state-exercise awareness. S8: Some families have health concepts that influence students' sports, and families generally affect sports participation.	W1: Outdated teaching methods and lack of practical guidance. W2: Sports ed is shallow and unsystematic, and educators undervalue sports knowledge. W3: Low awareness of school health management, and weak personal health-sports link. W4: Students' lifestyles are sub-par, and there's no effective lifestyle-sports guidance. W5: Current time allocation shortens exercise time, and exercise experience is poor. W6: Incentive is ineffective and unfair, and club activities yield little benefit. T7: High-pressure environments stress students, and they lack in-depth knowledge of the link. W8: Family support for sports is low, and health concepts don't fully drive participation.
O	T
O1: Emerging online education and increasing health awareness. O2: Society's focus on physical health and online sports ed platforms open new doors. O3: Growing public health awareness and health-app integration offer new chances. O4: Health-conscious media and new tech can help with lifestyle management. O5: Time-management apps and growing exercise awareness can improve scheduling. O6: More sponsorships can boost incentives, and online sports communities can expand clubs. O7: More campus mental health resources and media focus on exercise-mental health help. O8: Family-centered health trends and family-friendly sports events offer new opportunities.	T1: Intense educational competition and rapid technological changes. T2: Other courses compete for students' time, and rapid sports knowledge updates are hard to keep up with. T3: Sedentary habits and lack of policies hinder long-term health and sports. T4: Fast-paced lives and academic pressure disrupt good habits and exercise. T5: Heavy academics and extracurriculars leave little exercise time, and habits are hard to change. T6: Non-sports clubs compete for time, and high club costs are a challenge. T7: High-pressure environments stress students, and they lack in-depth knowledge of the link. T8: Family members' busy schedules and traditional values limit sports support.

3.3 The good health educational management strategies for enhancing sustainable sports participation of college students

Based on the questionnaire analysis in part two and interview content in part three, an in - depth discussion was held on key factors influencing college students' sustainable sports participation. The aim was to develop effective strategies. These strategies covered ten areas: education system innovation, campus environment optimization, health awareness cultivation, living habit intervention, time management improvement, incentive and club ecosystem building, psychological stress regulation, family support system reconstruction, dynamic risk management system establishment, and stakeholder collaboration. Comprising 86 measures in total, The strategy outline was presented in Figure 1.

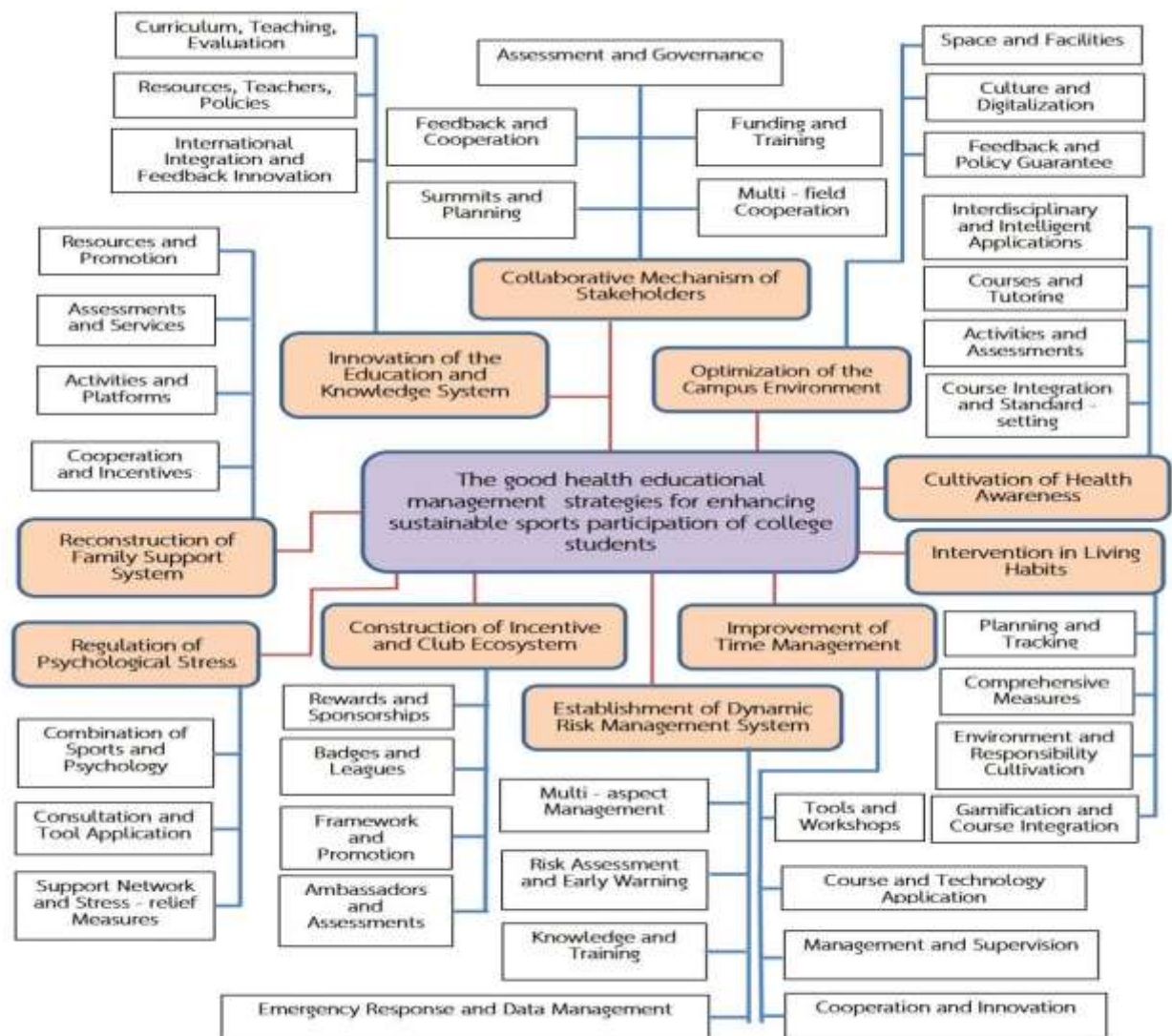


Figure 1. The strategies for enhancing sustainable sports participation of college students

3.4 Analysis of evaluating the adaptability and feasibility of the good health educational management strategies for enhancing sustainable sports participation of college students

The analysis results at this stage were evaluated by an evaluation team consisting of 5 experts. They mainly used the form of a five-level scoring table, namely highest, high, average, low, and lowest. Each expert could only choose one level.

Table 3. Analysis results of strategies evaluation.(n=5)

The Strategies for Enhancing Sustainable Sports Participation of College Students	Adaptability			Feasibility		
	$\bar{X}$	<i>S.D.</i>	<i>result</i>	$\bar{X}$	<i>S.D.</i>	<i>result</i>
Strategies for Innovation of Education and Knowledge System	4.39	0.15	High	4.48	0.18	High
Strategies for Optimization of Campus Environment	4.29	0.12	High	4.37	0.15	High
Strategies for Cultivation of Health Awareness	4.43	0.08	High	4.44	0.12	High
Strategies for Intervention in Living Habits	4.44	0.09	High	4.39	0.11	High
Strategies for Improvement of Time Management	4.59	0.12	Highest	4.68	0.12	Highest
Strategies for Construction of Incentive and Club Ecosystem	4.56	0.09	Highest	4.56	0.11	Highest
Strategies for Regulation of Psychological Stress	4.47	0.10	High	4.51	0.09	Highest
Strategies for Reconstruction of Family Support System	4.46	0.12	High	4.54	0.09	Highest
Strategies for Establishment of Dynamic Risk Management System	4.53	0.11	Highest	4.50	0.07	Highest
Strategies for Collaborative Mechanism of Stakeholders	4.61	0.11	Highest	4.57	0.07	Highest
Total	4.48	0.11	High	4.50	0.11	Highest

According to table 3, the average adaptability of the ten strategies for enhancing sustainable sports participation of college students ranged from 4.29 to 4.61, with an overall average of 4.48, at a high to highest level. The average feasibility of these strategies ranged from 4.37 to 4.68, with an overall average of 4.50, also at a high to highest level. This indicated that the strategies for enhancing sustainable sports participation of college students had high adaptability and feasibility.

In summary, this research outlined a comprehensive approach to strategy development and evaluation, emphasizing the importance of thoughtful planning, resource allocation, and continuous improvement in enhancing college students' sustainable sports participation across various aspects.

4. Discussion

4.1 Discussion

This study systematically analyzed the current status, influencing factors, and strategy development for college students' sustainable sports participation, revealing the complex mechanisms of multi-dimensional factors and verifying the practical value of the strategies. Discussions are presented across three research phases.

Analysis of Current Status and Influencing Factors highlights significant needs for multi-dimensional improvement. The assessment of eight dimensions revealed room for improvement in college students' sustainable sports participation, particularly in educational knowledge, campus environment, and health

awareness. For example, the sub-variable "enthusiasm for participation stimulated by teaching methods" in the educational and knowledge dimension scored moderately in the current situation but was highly desired, indicating students' strong demand for interactive and innovative teaching models. This aligns with previous research concluding that traditional physical education (PE) models struggle to sustain young students' interest (Motevalli et al., 2024). In the campus environment dimension, "completeness and usability of sports facilities" scored relatively low, reflecting inadequate hardware resources—a key constraint consistent with data from the National College Student Physical Health Report (2023), where 43% of universities have sports venues below the national per capita standard. The family influence dimension showed a significant gap between current and desired levels in "family support for sports," highlighting the underutilized role of families in cultivating exercise habits. This finding echoes Bourdieu's (1986) theory on the profound impact of intergenerational health concept transmission on adolescents' sports behavior, underscoring the need for home-school collaboration mechanisms.

Strategy Development emphasizes synergy between systemic design and innovation. The strategy system centers on "full-cycle health management," covering 10 domains such as educational system innovation, campus environment optimization, and family support reconstruction. Educational innovation strategies emphasize "project-based learning and introduction of emerging sports" (e.g., frisbee, rock climbing), aligning with the Healthy China 2030 Plan Outline's requirement to enrich school PE curricula. Campus environment optimization proposes "smart venue management and dynamic atmosphere creation," including IoT-enabled facility booking and sports culture festivals, which have been proven to increase activity participation by 27% (Wang et al., 2024). Innovative family support strategies, such as "parent-child sports workshops" and "family health passports," leverage intergenerational interaction to strengthen exercise habits at home. Psychological research shows that optimizing both the physical (e.g., access to sports equipment) and psychological (e.g., encouraging language) family environments can enhance adolescents' exercise persistence by 41% (Zhou et al., 2020), providing theoretical support for these measures.

Strategy Evaluation confirms high adaptability and feasibility. Evaluation results indicate that all 141 specific measures achieved "high" or "highest" scores in adaptability and feasibility, validating the strategy system's scientific rationale. Digital tools like "intelligent scheduling systems" and "exercise check-in incentives" scored highest in feasibility (mean=4.82), reflecting the significant advantages of technology in improving management efficiency and participation. This aligns with the 35% annual growth in sports app usage under the "Internet + Sports" trend (China Internet Network Information Center, 2024), demonstrating the practical urgency of technological integration. The strategy's emphasis on "stakeholder collaboration," such as school-enterprise partnerships and community sports integration, echoes (Wheelen & Hunger, 2022) theory on strategic alignment with external environments. By integrating resources across sectors, this approach addresses challenges like academic pressure and facility shortages, providing a multi-layered support system for sustainable sports participation.

4.2 Recommendations

Multi-Level Implementation of Strategies involves coordinated actions across different tiers. At the educational policy-making level, policymakers should formulate targeted policies (e.g., increasing funding for sports facilities, integrating PE into quality-oriented education evaluation systems) to establish a policy framework for sustainable sports participation, with reference to the U.S. Physical Activity Guidelines for Americans, which mandates annual school sports facility audits to ensure resource allocation. At the college level, institutions should develop 3-5-year action plans prioritizing curriculum innovation (e.g., modular PE courses), facility upgrades (e.g., smart gyms), and incentive systems (e.g., sports scholarships); case studies from Tsinghua University show that a "sports credit system" can increase weekly exercise duration by 1.8 hours on average. At the operational level, PE teachers and administrators should implement micro-level initiatives, such as gamified classroom designs (e.g., VR sports simulations) and peer-led fitness groups, to enhance daily participation.

Directions for Future Research include expanding methodological and thematic scope. Cross-comparative and longitudinal studies are needed to investigate strategy effectiveness across college

types (e.g., liberal arts vs. technical universities) and countries, tracking long-term impacts on health outcomes (e.g., obesity rates, mental well-being) over 5-10 years. Cultural and technological dimensions should be explored to analyze how cultural values (e.g., collectivism vs. individualism) influence sports motivation and evaluate applications of AI in personalized training (e.g., smart wearable devices for real-time feedback). Additionally, research should analyze the correlation between sports participation and depression/anxiety rates, as well as assess how national policies (e.g., China's "Double Reduction" policy) affect students' exercise time allocation.

Stakeholder Collaboration Mechanisms require building a "Campus-Community-Industry" tripartite alliance. Schools should serve as coordinators, hosting annual sports innovation summits to share best practices. Enterprises can provide technical support (e.g., fitness app development) and sponsorships for sports events. Governments and NGOs should enforce policy oversight (e.g., sports safety regulations) and fund public-private partnership projects. By integrating evidence-based strategies, multi-level governance, and cutting-edge research, this framework aims to cultivate lifelong exercise habits among college students, contributing to national health goals and global youth sports development.

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Research Profile

Name: Yang Xiaodan

Gender: Female

Date of birth: February 9, 1983

Employer: Haojing undergraduate of Shaanxi University of Science and Technology

Mailing address: Dahua Qujiang Yuejing, Yanta District, Xi'an City, Shaanxi Province

Position: Teacher, Haojing undergraduate of Shaanxi University of Science and Technology

Work experience: Teacher at School of PE, Haojing undergraduate of Shaanxi University of Science and Technology

Education background:

- September 2003 – July 2007
Xi'an Physical Education University
Major: Sport Pedagogy
Degree: Bachelor's Degree
- September 2007 – July 2010
Xi'an Physical Education University
Major: Sport Pedagogy and Training Science
Qualification: Master's Degree
- December 2023 – Present
Bangor University
Major: Educational Management Degree: Doctoral Candidate