

# Interdisciplinary Case-Based Teaching Promoting the Integration of Physical Education and Health Curriculum in China

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## Abstract

Against the backdrop of quality education, integrating physical education and health courses in China has been regarded as essential to fostering students' comprehensive development. This study explores leveraging interdisciplinary case-based teaching to promote the in-depth integration and fusion of physical education and health courses in China. The research systematically reviews the theoretical foundations of integrating physical education and health courses, interdisciplinary teaching, and case-based teaching methods in China. The study summarizes the comprehensive cases for conducting interdisciplinary case-based teaching while also pointing out the challenges in the implementation process, such as teachers' professional development lag, deficiencies in the evaluation system, and the scarcity of high-quality case resources. Finally, the study proposes strategies and recommendations in management, teacher development, and evaluation for promoting integrating physical education and health courses through interdisciplinary case-based teaching. This research provides a new practical path for optimizing physical education and health courses in China. It offers valuable insights for the integration of other disciplines, possessing both theoretical value and practical significance.

**Keywords:** physical education teachers, health education, interdisciplinary collaboration, case-based teaching model.

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## 1. INTRODUCTION

### 1.1 Concept and Importance of Integrating Physical Education and Health Courses

Physical and health education are essential components of school education and have long been relatively disconnected. Physical education courses promote students' physical development and cultivate sports skills, while health education emphasizes health knowledge and lifestyle cultivation. With the in-depth promotion of quality education, people have become increasingly aware of the inherent unity of these two courses, both aimed at promoting the comprehensive development of students' physical and mental well-being. Consequently, the call for integrating physical education and health courses has become increasingly prominent.

Course integration refers to the systematic integration and reshaping of initially relatively independent subject courses at instructional design, implementation, and evaluation levels, thereby forming a new comprehensive curriculum system. The core of integrating physical education and health courses is to break away from the previous state of physical education

and health education operating independently, fully explore the convergence points between the two courses in terms of goals, content, and implementation methods, and integrate and infuse them to form a systematic and holistic comprehensive course.

Achieving the integration of physical education and health courses is of great significance: on the one hand, it is conducive to helping students establish a correct understanding of health and a lifelong awareness of physical education, internalizing health knowledge into behavioral habits; on the other hand, it is beneficial for schools to alleviate course pressure and provide students with time for development; at the same time, it also helps teachers transform their mindsets, broaden their comprehensive teaching perspectives, and enhance their professional skills. In the long run, integrating physical education and health courses is an inevitable requirement for implementing quality education and is conducive to promoting the comprehensive development of students.

## 1.2 Application of Case-based Teaching in Course Integration

Case-based teaching is a teaching method centered around cases. It introduces specific cases to stimulate students' learning interest and initiative and promote the cultivation of their problem-solving abilities and comprehensive application abilities. In the context of course integration, case-based teaching has significant application value.

First, case-based teaching can help students organically combine knowledge from different disciplines. By selecting cases involving multiple disciplinary contents, students must comprehensively apply knowledge from various disciplines to analyze and solve problems, thereby promoting integration and cross-fertilization among different subjects.

Second, case-based teaching is conducive to cultivating students' comprehensive thinking and innovative abilities. In case analysis, students need to think about problems from different perspectives, propose solutions, and continuously adjust and refine them in practice, which helps foster their critical thinking and innovative awareness. Meanwhile, through discussions and collaborations with classmates, students can also draw nourishment from others' viewpoints and experiences, broadening their thinking space and enhancing their comprehensive literacy.

Case-based teaching has important application significance in course integration, as it can help students organically integrate knowledge from different subjects, cultivate their comprehensive application and innovative abilities, and promote in-depth and advanced interdisciplinary learning. Therefore, adopting case-based teaching in physical education and health courses can facilitate their integration with other subjects, enhancing teaching effectiveness and students' comprehensive literacy.

## 2. RESEARCH METHODS

### 2.1 Literature Review

This study will employ the literature research method to systematically review and analyze existing literature related to interdisciplinary teaching, case-based teaching methods, and course integration. The literature research will include searching and synthesizing analyses from domestic and international academic journals, professional books, research reports, and internet resources to gain an in-depth understanding of the theoretical and practical research achievements in using interdisciplinary teaching and case-based teaching methods to promote the integration of physical education and health courses.

### 2.2 Case Study Method

This research will adopt the case study method to profoundly investigate the practical situations of interdisciplinary teaching and integrating physical

education and health courses in China. It will analyze the application effects, existing problems, and challenges of case-based teaching in promoting the course integration process.

## 3. RESEARCH CONTENT

### 3.1 Background:

In a community high school's physical education and health courses in China, teachers decided to use a case study to guide students in understanding the importance of healthy eating and exercise injury prevention. The case aimed to enable students to comprehensively apply knowledge from multiple disciplines, such as biology, nutrition, and sports medicine, to analyze and solve real-life problems.

### 3.2 Case Content:

Tom, a high school freshman, has recently been fond of choosing foods high in sugar and fat in the school cafeteria, and he spends most of his after-school time at home playing mobile games, with almost no participation in any physical exercise. Not long ago, Tom suddenly felt knee pain while running during a physical education class and was later diagnosed with an exercise-related injury from running, requiring rest for some time to recover. This series of events caught the teacher's attention, and they decided to use health education to guide students in understanding the importance of a healthy lifestyle.

### 3.3 Task:

Students need to analyze how Tom's dietary and exercise habits affect his health and identify the problems and potential harms. Students must provide suggestions for improvement to Tom, including dietary adjustments and appropriate physical exercise. Students need to comprehensively apply biology, nutrition, and sports medicine knowledge to develop a reasonable diet plan and exercise regimen for Tom and explain the scientific rationale behind it.

### 3.4 Solution

Using biological knowledge, students analyze that excessive intake of high-sugar and high-fat foods can lead to health issues such as obesity and unstable blood sugar levels. In contrast, prolonged sedentary behavior and lack of exercise can easily lead to muscle and skeletal problems, such as knee pain experienced by Tom.

Based on nutritional knowledge, students recommend that Tom increase his intake of vegetables, fruits, whole grains, and proteins and reduce his consumption of high-sugar and high-fat foods to maintain a balanced diet. They also suggest that he engage in moderate aerobic exercise daily, such as walking or cycling, and appropriate strength training to enhance muscle and bone health.

By integrating knowledge from sports medicine, students explain the benefits of exercise for physical health, such as promoting blood circulation, enhancing cardiovascular function, and increasing bone density. They developed a detailed diet plan and exercise regimen based on Tom's situation to meet his nutritional and healthy exercise requirements.

Through this comprehensive case study, students understand the importance of healthy eating and appropriate exercise for physical health and how to integrate knowledge from multiple disciplines to solve real-life health problems. Such case-based teaching promotes students' interdisciplinary learning and comprehensive application abilities, helping them develop healthy lifestyles and behaviors.

## 4. RESULT AND DISCUSSION

### 4.1 Strategies for Advancing Interdisciplinary Case Teaching Integration in Physical Education and Health Curriculum:

#### 4.1.1 Management Aspects:

Improving top-level design is paramount to promote the effective implementation of interdisciplinary case teaching methods in integrating physical education and health curriculum. Led by the education authorities, a curriculum integration expert committee composed of experts, scholars, and frontline teachers should be established to systematically plan and design the overall framework, implementation pathways, and supporting policies for curriculum integration.

Based on extensive research and thorough argumentation, the expert committee must develop unified interdisciplinary curriculum standards, clarify the objectives, content, and teaching requirements of integrating physical education and health curriculum, and provide guiding documents for regions and schools. Simultaneously, efforts should be made to systematically develop and build a high-quality case resource library, collect and organize representative interdisciplinary teaching cases, and form replicable and scalable teaching examples for frontline teachers to draw from and reference.

Furthermore, top-level design should also emphasize policy alignment and support. Corresponding policies and measures should be formulated for teacher training, curriculum evaluation, budget allocation, etc., to create favorable conditions for deepening curriculum integration. Through systematic design and policy coordination at the top level, grassroots reform practices can be effectively supported.

Innovative management mechanisms are also needed at the school governance level to establish institutional foundations for implementing interdisciplinary case teaching. The traditional school management model often organizes administrative teams according to subject areas, leading to functional

segmentation and barriers that no longer meet interdisciplinary teaching requirements. Therefore, schools can break the existing management model and establish interdisciplinary comprehensive curriculum groups to coordinate the design and implementation of interdisciplinary teaching activities, forming a cohesive force for overall advancement.

Additionally, schools should enhance internal resource integration efforts to create favorable conditions for interdisciplinary teaching. For example, existing physical education and health teaching resources can be coordinated to establish shared practical training bases, teaching facilities, and equipment repositories for interdisciplinary teaching. Innovative scheduling of timetables can also be explored to allocate dedicated time slots for interdisciplinary teaching to avoid scheduling conflicts. Furthermore, schools should focus on fostering a culture of interdisciplinary integration by strengthening publicity and training to help teachers and students develop interdisciplinary awareness and increase their acceptance of interdisciplinary teaching models, thereby ensuring the smooth implementation of reform measures.

In addition to internal school reforms, coordination among relevant departments is necessary to create a collective force. Integrating physical education and health curriculum involves a wide range of areas, but it concerns the education sector. It is closely related to other departments, such as health and sports. Therefore, coordinating various forces is a daunting systemic task.

All relevant departments should strengthen communication, clarify responsibilities, closely cooperate, and form a collaborative effort. For example, the education authorities can be responsible for overall planning and design, teacher training, etc.; the health department can provide health education resources; the sports department can share sports facilities, etc. Only through the concerted efforts of all parties, leveraging their respective advantages, can various resources be maximally integrated, creating a favorable external environment for curriculum integration. At the same time, the government and all sectors of society should increase support for curriculum integration. Providing adequate financial and material resources and strengthening the coordinated interaction among families, schools, and communities is necessary, forming a societal synergy in education and creating favorable conditions for integrating physical education and health curricula.

#### 4.1.2 Teacher Training:

Constructing a teaching staff is critical in advancing the integration of physical education and health curriculum through interdisciplinary case teaching. Due to the long-standing focus on single-subject training for primary and secondary school teachers in China, with limited exposure to interdisciplinary teaching concepts and methods, there is an urgent need to increase efforts in training interdisciplinary teachers.

In the training process for prospective teachers, higher education institutions should make interdisciplinary literacy a compulsory component, integrating it into educational philosophies and curriculum settings. Future teachers should be aware of the importance of interdisciplinary education and grasp relevant theoretical knowledge such as curriculum integration theory and interdisciplinary teaching design theory. Additionally, they should be trained in innovative teaching methods such as case and situational teaching to equip them with the essential skills for conducting interdisciplinary case teaching.

For in-service teachers, various forms of specialized interdisciplinary training are necessary. Schools can regularly organize seminars, observation activities, etc., inviting experts and scholars to provide systematic training for physical education and health teachers, imparting basic knowledge and teaching skills. Leveraging the efforts of education authorities, large-scale inter-regional training can be organized externally, inviting industry veterans to conduct courses on interdisciplinary teaching design, case analysis, etc., to solidify teachers' interdisciplinary teaching abilities from theoretical and practical perspectives.

The key to cultivating interdisciplinary teaching teams lies in constructing collaborative interdisciplinary teaching teams. The traditional teaching method involves teachers of single subjects independently preparing lessons, which is no longer suitable for interdisciplinary integration requirements. Therefore, schools should encourage teachers from different subjects to proactively form teaching teams to undertake the responsibilities of curriculum design and teaching implementation collectively responsibilities.

Various forms of collaborative lesson planning can be explored, such as collaborative lesson preparation and heterogeneous teaching. Collaborative lesson preparation involves teachers from different subjects jointly participating in designing teaching cases or scenarios, fully exchanging perspectives from different subjects to form integrated lesson plans. Heterogeneous teaching refers to different subject teachers entering the same classroom simultaneously, each taking on different roles and tasks, forming a three-dimensional teaching interaction.

Through these collaborative forms, teachers can fully integrate their professional strengths and resources, expand their comprehensive teaching perspectives, and continuously improve their professional literacy through mutual exchange. For example, physical education teachers can learn physiological and health knowledge from health teachers, while health teachers can seek advice from physical education teachers on activity organization and venue utilization. This mutual and complementary collaboration process will encourage teachers to develop interdisciplinary thinking and

internalize beneficial experiences into practical wisdom.

In addition to internal school training, sharing and exchanges between regions and between schools are also necessary. Education authorities can regularly organize observation activities for backbone teachers within regions to conduct interdisciplinary case teaching, hold concentrated discussions on excellent teaching cases, and invite the designers of case teaching to share their experiences, achieving a demonstrative and guiding effect.

Furthermore, support for paired assistance activities between schools can be provided. Mature schools can implement interdisciplinary case teaching and be paired with schools in the exploration stage. Through regular observation and exchanges, concentrated training, etc., excellent experiences can be disseminated and shared.

In addition to offline exchanges, the Internet+ era provides convenience for promoting experience sharing. Education authorities can compile and construct high-quality case resource libraries online, realizing the open sharing of case teaching resources through online learning platforms, teaching communities, etc. By promoting the circulation and replication of excellent cases and experiences through multiple channels within regions, nationally, and even globally, a powerful demonstrative radiation effect will be formed, aiding in rapidly improving the interdisciplinary teaching level of more teachers.

#### 4.1.3 Evaluation Aspect

Innovative assessment mechanisms are pivotal in advancing physical education and health curriculum integration. Traditional examination assessments overly emphasize testing singular subject knowledge, neglecting the evaluation of students' comprehensive literacy, which is incongruent with the goals of integrating physical education and health curriculum. Hence, the evaluation philosophy must shift, incorporating relevant, comprehensive literacy into the assessment system.

Specifically, the evaluation content should focus on students' comprehensive physical education and health abilities, such as lifelong physical education awareness and healthy lifestyles. Through diversified assessment formats like case analysis and scenario simulations, students' ability to apply knowledge of physical education and health to solve real-world problems can be tested. For instance, a scenario of outdoor activities could be set, requiring students to devise reasonable safety precautions and first aid measures, thus assessing their comprehensive application of relevant knowledge. Additionally, the evaluation content should also reflect comprehensiveness and developmental aspects. Attention should be on students' mastery of knowledge



and process evaluation, such as participation, cooperation, and innovative thinking, ensuring alignment between evaluation content and educational objectives, thereby promoting students' comprehensive development.

Alongside innovative assessment methods, there is a need to strengthen attention to the learning process, focusing on evaluating students' participation, cooperation, and innovative thinking, thus reflecting evaluation's process-oriented and developmental nature. For example, in interdisciplinary case-based teaching activities, teachers can design corresponding process evaluation criteria to assess students' enthusiasm, quality of questioning, teamwork spirit, problem-solving approaches, etc. Through tracking and evaluating the learning process, teachers can comprehensively understand students' comprehensive literacy development and promptly identify issues for targeted guidance, facilitating continuous student growth.

Moreover, incorporating diverse stakeholders such as student self-assessment, peer assessment, and parental evaluation can enhance the assessment's comprehensiveness and scientific rigor. For instance, self-assessment forms or group peer assessment sheets can be designed to cultivate students' abilities in self-reflection and peer review. Parents can also be invited to evaluate students' participation in community practice activities, fostering a beneficial interaction between societal and school evaluations.

#### 4.2 Future Challenges of Interdisciplinary Case-Based Teaching in Promoting Curriculum Integration

Firstly, there is a lag in the professional development of teachers. Many educators find adapting to interdisciplinary collaborative teaching difficult due to their traditional disciplinary backgrounds and rigid mindsets.

Secondly, constraints from the school management system pose challenges. Currently, schools often organize administrative structures and curriculum systems based on disciplines, lacking top-level design and institutional support for interdisciplinary teaching, which makes it challenging to promote and implement.

Moreover, the outdated and standardized examination evaluation system is another major obstacle. The existing examination assessments overly emphasize the evaluation of subject knowledge, neglecting the assessment of comprehensive qualities, which hinders the cultivation of students' interdisciplinary comprehensive abilities.

Finally, curriculum resources are scarce, exceptionally high-quality, interdisciplinary case studies, which lack systematic development and sharing.

Only through comprehensive efforts in management, teacher training, evaluation, and other aspects, and by continuously deepening reforms, can a solid foundation be laid for promoting interdisciplinary case-based teaching models in integrating physical education and health curriculum.

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