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INTEGRATION OF SPORTS AND MEDICINE: A NEW DIRECTION FOR INTERDISCIPLINARY SUBJECT LEARNING IN PHYSICAL EDUCATION

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Abstract

Interdisciplinary Subject Learning (Below the ISL) with the aim of multi-disciplinary integration and promoting student development was the new content of *Compulsory Education Curriculum Standards for Physical Education and Health (2022 Edition)*. As a typical example of interdisciplinary integration, *Integration of Sports and Medicine* (Below the ISM) has a high degree of adaptability to ISL. Therefore, ISM can be a new direction for ISL in physical education. In order to find out the possible problems of ISL with ISM as the theme, a thematic analysis was carried out with three basic elements as the analysis framework: the design of teaching materials, the evaluation system, and the teachers' abilities. This provides a basis for the successful development of ISL with the theme of ISM in primary and secondary schools in the future. The origin and development of ISM and related research on ISM in China are also discussed. Based on a review of the history of ISM research in China as well as the understanding of the internal logic of ISM and ISL, a plan for the future implementation of ISL with the theme of ISM is outlined, including the design of teaching materials by grasping the characteristics of ISM and ISL, improving the evaluation system from multiple dimensions, and strengthening the training of teachers' comprehensive ability in sports and medicine before and in service.

Keywords:

integration of sports and medicine (ISM), interdisciplinary subject learning (ISL), physical education and health curriculum



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Introduction

China's health services have advanced greatly since the People's Republic of China was established, particularly since reform and opening up. And the country's citizens' primary health indices are better than the global average for middle- and high-income nations. The working and living habits of Chinese people, as well as the range of diseases, are continually changing as a result of rapid industrialization, urbanization, and population aging.⁰ Cardiovascular and cerebrovascular diseases, cancer, chronic respiratory diseases, diabetes and other chronic non-communicable diseases are serious threats to the lives and health of locals.⁰ According to data from 2019, these diseases were responsible for 88% of all fatalities and more than 70% of all disease burden.⁰ Residents' understanding of health issues is low, and diseases brought on by bad lifestyles including smoking, binge drinking, inactivity, and unhealthy eating are becoming more and more prevalent.⁰ The concept of *Integration of Sports and Medicine* (Herein after referred to as the ISM) in China was proposed when the State Council issued the *Healthy China Plan* in October 2016 in response to the growing health problems.⁰

Early in 2020, the COVID-19 pandemic spread quickly around the world, having a significant impact on people's lives. While exploring the treatment options throughout the epidemic, people were also considering ways to boost their own immunity and prevent infection. Sports have drawn a lot of interest from people from all walks of life due to their effective fitness function, and ISM has once again become a research hotspot.⁰ Similar to this, schools started to place more emphasis on student athletics and health education, which promoted the development of ISM on campus. Physical education and health curriculum have therefore drawn greater attention recently as it serves as the major platform for students' sports and health education. A new component of *Interdisciplinary Subject Learning* (Herein after referred to as the ISL) was introduced to the revised *Compulsory Education Curriculum Standards for Physical Education and Health (2022 Edition)* that were released by The Ministry of Education of the People's Republic of China (MOE) in 2022.⁰ The interdisciplinary character that ISL highlights completely demonstrates its compatibility with ISM while also improving the content of physical education. Researching on ISL with the theme of ISM is very important from the standpoint of physical education instruction in order to better optimize and develop physical education. And it is crucially significant from the standpoint of ISM development for further deepening ISM.

In order to better comprehend ISM and establish a better logical connection between ISM and ISL, we first make a brief review of the origin and development of ISM and ISM's tradition in China. Additionally, a thematic analysis was conducted using three basic elements as the analysis framework: the design of teaching materials, the evaluation system, and teachers' comprehensive ability in sports and medicine. The goal was to identify potential issues with ISL with the theme of ISM and offer the corresponding suggestions. Additionally, the origin and



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development of ISM and Chinese ISM-related research are all explored to comprehend the relationship between ISM and ISL more fully.

Method

We adopted the methods of a systematic review and thematic analysis for this study.

Data Collection

The literature search covered official and semi-official documents including the articles related to ISM and ISL research, Chinese books about sports and policy and regulatory texts. Sources of data mainly included Chinese National Knowledge Infrastructure (CNKI), Wanfang (It collects the full text of 7600 kinds of science and technology journals in more than 70 categories of five categories: science, engineering, agriculture, medicine and humanities), VIP (One of the world's famous Chinese professional information services), and other Chinese databases. Specifically, to establish a theoretical and knowledge base for this study, CNKI was used to search pertinent subjects in the following journals, conferences, academic papers, newspapers, and research reports in the following terms: (1) "sports" OR "exercise" OR "physical activity" OR "physical education" AND "medicine"; (2) "integration of sports and medicine" OR "combination of sports and medicine" AND "physical education and health curriculum" OR "physical education curriculum" OR "physical education"; (3) "interdisciplinary" OR "interdisciplinary learning" OR "interdisciplinary subject learning". In addition, by referring to news reports, key textbooks of related disciplines, policy texts and legal documents, the authors collected and classified relevant information about ISM and ISL. These can be taken as evidence to support or reject certain views to ensure the rigor of logic and scientific reasoning.

Data Analysis

Data were analyzed by thematic analysis. As mentioned above, the framework of this study consists of three basic factors, the design of teaching materials, the evaluation system, and teachers' comprehensive ability in sports and medicine. These three factors served as the guide for identifying themes. They were first grouped into core themes, and the data were then presented in terms of sub-themes within the three core themes.

Result

The Origin and Development of ISM

The concept of ISM originated in the United States, using medical knowledge and sports to address emerging health problems. The United States, as a pioneer in sports health promotion, experienced a national health crisis in the 1960s caused by a lack of exercise.⁰ To address this issue, the United States carried out a number of studies on the health effects of lack of exercise in the 1970s and attempted to gradually include some exercise interventions.⁰ Following government advocacy, health agencies in the United States gradually linked health and exercise and made



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physical activity and health education an important means of achieving multiple health goals.⁰ In 1979, the U.S. Department of Health and Human Services (HHS) issued the *National Health: Health Promotion and Disease Prevention Report*.⁰ Since 1980, HHS has been implementing the National Health Strategy by incorporating campaigns into the health management system, while the United States Government has issued the *Healthy People: National Health Promotion and Disease Prevention Objectives* and will issue a new *Healthy People Program* every 10 years.⁰ With the implementation of the *Healthy People Program*, the results of research in the field of sports health have increased and the relationship between sports and health has gained a deeper understanding.⁰ The American college of sports medicine (ACSM) and the United States centers for disease control and prevention jointly published the *Physical Activity and Public Health* in 1995,⁰ which takes physical health promotion to a new level. Since 2000, the United States has continued to advocate physical health promotion and revised the *Physical Activity and Public Health* into the *Physical Activity Guidelines Advisory Committee Report*.⁰ In 2007, the ACSM put forward the idea of *Exercise is medicine* (EIM),⁰ and the American scholar Berryman Jack W. (Berryman, 2010) expounded on the idea of sports as a function of treating diseases, thus the idea of ISM was initially formed.⁰

The development of ISM in the United States has attracted the attention of more countries, and some developed countries have carried out attempts with their own characteristics. The United Kingdom exercise referral scheme,⁰ which emerged in the early 1990s, referrals patients with chronic illnesses from primary care to third parties, provides an exercise program designed to encourage participants to improve their physical activity⁰ as part of ISM in the United Kingdom. Gymnastics, exercise, and other physical activities have been associated with health and happiness in Germany since the 19th century.⁰ Modern sports and modern, scientific-based sports medicine have been established and gradually developed since the Weimar Republic in the 1930s.⁰ And the growth of ISM in Germany has a strong foundation in sports medicine. Germany has actively pursued ISM health promotion after 2000 through strategic deployment, policy making and personnel training. The ISM health promotion model with German characteristics has been gradually formed.⁰ Korea began training for the programme of ACSM certificates in 1995, and Korean government started issuing exercise prescription certificates.⁰ And Japan has also formed its own ISM system of multi-party collaborative health promotion, which is aimed at alleviating a series of health problems caused by population aging.⁰ With the popularization of sports medicine in the world, the extension of sports field, and the pursuit of life and health by people all over the world, the international attention of ISM is increasing with the development of the times. China began to examine the value of ISM to the country. The Chinese ISM tradition is divided into three periods: 1) before 1949; 2) after 1949; 3) after the emergence of the *Healthy China Plan*, which will be discussed in detail in section below respectively.



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ISM's Tradition in China

The Tradition of Therapeutic Exercise in Ancient China (Before 1949)

Before ISM was formally put forward, similar and interlinked theories appeared in ancient China. To some extent, ISM is not entirely new to China. As early as in the Tang Yao period, the idea of taking exercise as a means of treatment was recorded as follows. "In the beginning when Taotang ruled the country, Yin was overfilled and deposited. The waterway was blocked and could not flow through its original path. And the people's spirit of depression accumulation stagnation, muscles and bones could not be stretched. Therefore, Taotang created a dance to promote flow of qi and blood."⁰ Among them, "dance" is a traditional Chinese sports activities. People alleviate physical discomfort through the traditional sports activities. The use of exercise as a treatment is very common in the later emergence of in the later emergence of *Exercise Prescriptions in Traditional Chinese Medicine* (Herein after referred to as TCM). It is considered as the bud of TCM.⁰ Zheng Huaixian's theory of "integrating traditional Martial Arts and Traditional Chinese Medicine" is a typical example of TCM. It combines sports with traditional Chinese medicine deeply, and uses the form of martial arts to cure diseases with the principle of TCM.⁰ TCM has a long history in China and is the product of ISM in ancient China.

In the traditional customs of ethnic minorities in China, the content of sports health promotion can also be found. The preparatory body brushing in Tibetan traditional fitness method has a strong effect on the prevention of cardiovascular diseases.⁰ In the Yi ethnic area, wrestling is also a common supplementary therapy to exercise the function of body organs and promote the recovery of the body. As a part of Yi nationality medicine, wrestling plays an important role in the treatment process.⁰

The importance of sports is often mentioned in ancient Chinese medical theory. "Yuanqi", or "vitality" in English, refers to the body's tissues and organs physiological function of basic material and activity.⁰ It is regarded as a raw material of human life in ancient China. Doctors further divided it into "innate vitality" and "acquired vitality", and thought that physical exercise plays an important role in maintaining innate vitality. In the way, the theoretical basis of physical exercise regimen beyond the scope of traditional medicine has been constructed.⁰ In the traditional Chinese Taoist medical health maintenance view, attention is paid to the conditioning of vitality. Taoists created "Daoyin gymnastics" to recuperate vitality, which is a form of exercise with Taoist characteristics. And it also advocated the practice of Daoyin gymnastics to prevent and treat diseases.⁰

ISM in ancient China has a strong national traditional color, and the diversity of Chinese traditional culture can make it present in people's daily life through different forms. ISM in ancient China provides the direction and enlightenment for further deepening the ISM in China.

ISM after the Founding of People's Republic of China (1949-2016)



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In 1952, Mao Zedong put forward the guideline of "developing sports and strengthening people's physical fitness", linking sports and physical health.⁰ The relevant academic research on ISM formally began in China. The earliest article that can be found in the Chinese database was published in 1953. Wang Duoan (Wang, 1953), in an article on "Medical Supervision and Health Education in Physical Training" published in *People's Military Surgeon*, said that doctors and physical education teachers should make systematic observation of the trainees during the training process to ensure that the amount of exercise they set is in line with their physical conditions. Wang believed that workers in sports and medicine should cooperate with each other to complete teaching and guidance work. He emphasized the importance of health education work. And it should be occupied the main position in the medical supervision system. At the same time, he mentioned the sport for the promotion of health effects. He also put forward the idea that "physical education and sports can improve health" and "sports and exercise can prevent many diseases".⁰ It is a part of the fitness function of sports today,⁰ which is similar to the goal of medical prevention and treatment of diseases and maintenance of health. Although the word "ISM" did not appear in this article, there is no lack of ideas and suggestions consistent with ISM. This is the opening work of Chinese scholars to jointly discuss and study sports and medicine after the founding of New China. And it opens the prelude of China's exploration of ISM.

In the beginning, the relevant research in China mainly introduced the development status of sports medicine and learned from the experience and achievements of foreign countries. Such as "Sports Medicine Research Work of the Japan" (1973), "Introduction to Sports Medicine at Home and Abroad" (1978), "Introduction to the 1977 Annual Meeting of American Sports Medicine" (1978) and "Overview of Sports Scientific Research Development in Several Countries" (1979) and so on. They showed sports medicine from the international perspective to domestic scholars, that is, ISM proposed in the early stage in Western countries. Yang Xirang (Yang, 1978) stated that by understanding the research situation and development trend of international sports and medicine crossover, more research enlightenment can be provided for China.⁰

After the 1980s, Chinese scholars began to turn more attention inwards. Fan Defu (Fan, 1980) clearly proposed the application of traditional Chinese medicine in physical education and training for the first time, making it more valuable. And he emphasized the recuperation function of Chinese herbal medicine for human body.⁰ It further combines physical education and medicine in teaching and training. Later, academic seminars on sports medicine have been held all over the country. The effect of sports and medicine to improve health problems together has attracted more attention from scholars. Exercise rehabilitation and exercise therapy have become hot spots of research. Such as "Improving Fingers' Function of Mental Retarded Students with a Method Combining Medicine with Physical Education and Education" (1993), "3-week Rehabilitation Medical Procedure for Lumbar disc



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Herniation" (1994), "On the Characteristics and Functions of Physical Rehabilitation" (1995) and other articles, showed the practical value of ISM.

Since, scholars have tried to understand the internal logic of ISM. Why can "sports" and "medicine" merge? Why do the two fields overlap? These are important question that needs to be answered for the development of the research of ISM. Therefore, the theoretical research on ISM has been further carried out. Chen Qing (Chen, 2003) in the evaluation of F. D. Wolinsky, by *The Sociology of Health*, said the sports workers should further compensate for the shortage of medical care services, because the medical establishment is mainly aimed at the patient group. Sports can enable people to play healthy roles for longer.⁰ It suggested that the complementary action between the sports and medical treatment. This view has been further confirmed in recent studies. According to Yang Guang and his colleagues (Yang et al., 2021), sports and medicine work together as collaborative units in ISM system, reflecting their complementary value functions.⁰ Both are useful tools for people facing health and disease problems. Yang Liming (2007) believed that physical exercise is the internal cause of improving physical health, while various means of preventing and treating diseases in medicine are the external cause. From the perspective of materialist dialectics, the coexistence of the two is of great significance for improving human health.⁰ With the deepening of research, the theoretical basis of ISM is constantly improved. People's understanding of ISM is also more comprehensive. Cai Jianguang (Cai, 2022) said in the latest research results, the essence of physical education is life and health education. Its basic function is to promote life and health. The theoretical basis of sports to promote health is closely related to modern medical science. At the same time, many studies have shown that the deep integration of sports and medicine is the most effective way to achieve health promotion. All of these contribute to the logic of ISM, revealing the intrinsic connection between sports and medicine in the goal of health promotion.⁰

ISM after the Emergence of the Healthy China Plan (2016-Present)

In 2016, *Healthy China Plan* proposed to "focus on primary and secondary schools to establish a school health education promotion mechanism".⁰ Chinese scholars have performed substantial research on the significance of ISM for schools and students. Physical education and health curriculum is the main carrier of ISM in campus. A large number of ISM-related practice needs to be carried out in physical education and health curriculum. Guo Jianjun (Guo, 2016), in accordance with the relevant national policies and instructions on physical education for adolescents, proposed that the task of school physical education should be shifted from a single sports skill education to a comprehensive scientific exercise guidance that is more related to physical health. And students should learn to maintain healthy exercise skills and knowledge in physical education classes. The path of a "combination of school sports, physical education and medical treatment" is conducive to the comprehensive health of students.⁰ ISM can solve the actual problems such as health education, sports health care, exercise rehabilitation and so on in schools.



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Huang Yue and his colleagues (Huang et al., 2019) believed that schools are one of the main places for the promotion and implementation of the health literacy of adolescents. Schools are responsible for the imparting of sports knowledge and clinical medical knowledge, the teaching of sports fitness skills, rehabilitation and treatment skills, and the promotion of scientific health outlook, healthy lifestyle and behavior.⁰ Hu Jianhua and his colleagues (Hu et al., 2020) proposed that ISM is an important measure to address the frequent occurrence of physical health problems among primary and secondary school students in China. With the guidance of school teachers, it can provide scientific basis for students to participate in physical exercise, effectively prevent the occurrence of diseases, and enable students to form a more comprehensive understanding of physical health.⁰ Liang Siyu and her colleagues (Liang et al., 2021) put forward the view that primary schools and secondary schools are the main places for the promotion of the physical health of adolescents. It is implemented by teaching the knowledge of body posture and adjusting body posture separately in daily study and physical education curriculums.⁰ Wei Ming and Niu Xuesong (Wei, 2022) pointed out that the student era is the key period for the prevention and control of the abnormal physical posture of adolescents, and put forward the implementation suggestions for the relevant work from the perspective of schools.⁰ It can be seen, the importance of school education for health promotion through ISM was emphasized by many scholars.

Compulsory Education Curriculum Standards for Physical Education and Health (2022 Edition) adds a new content of ISL, which once again provides a new research direction for ISM. ISL emphasizes the integration of physical education with moral education, intellectual education, aesthetic education, labor education and national defense education in order to promote the all-round development of students, which is an important way for students to improve their sports ability and learn health knowledge.⁰ In the course of physical education and health, the flying parabola of the ball and the angle of the player hitting the ball reflect the mathematical elements. Art elements can be reflected through the graceful posture and coordination that students display in the class. The rhythm of the music in gymnastics, callisthenics and other events reflect the musical elements. And teachers' emphasis on sports safety reflects medical elements.⁰ These show that there is a strong connection between physical education and other disciplines. The ISL in physical education and health curriculum is in line with the actual teaching situation, and its essence is to further improve the original physical education. Han Leilei and his colleagues (Han et al., 2022) believed that ISM is interdisciplinary cooperation from the source of disciplines to achieve the unity and innovation of knowledge and skills.⁰ They emphasized the interdisciplinary nature of ISM. As a typical example of interdisciplinary integration, ISM has a high degree of adaptability to ISL. It not only enriches the content of physical education curriculum, but also provides a new idea for the selection of materials for ISL of physical education, which is a positive addition for the physical education and



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health curriculum. Therefore, it is logical to take ISM and ISL as a subject for further research.

After the founding of the People's Republic of China, the depth and breadth of related studies on ISM are constantly increasing. It provides a solid theoretical basis for the combination of ISM and ISL. At the same time, the latest research topic also leads to the subsequent research direction, that is, how to better carry out ISL with the theme of ISM.

The Teaching Materials: The Imbalance between Content and Value, the Disconnection between Different Learning Stages, the Chasm between the Major System and the Supporting Structure

With the deepening of the physical education curriculum reform in basic education, the new version of physical education and health compulsory education curriculum standards has replaced the old version of curriculum standards. It has become the guiding document governing the physical education and health curriculum in basic education. Correspondingly, the teaching materials design of physical education curriculum also needs to be updated and improved. As a new content of the new curriculum standard, ISL has not appeared in the previous physical education and health curriculums. Therefore, it is more crucial to consider how to design teaching materials that reflect the interdisciplinary nature, rather than simply applying the design template of previous teaching material. Yao Lei and Li Minghan (Yao and Li, 2021) found in their research on the integration of fine traditional Chinese culture into physical education textbooks that the presentation of content, the connection of learning stages and the structure of teaching materials were the main problems faced in the design of corresponding teaching materials.⁰ For the design of ISL with the theme of ISM teaching materials, problems are also likely to appear in the above three dimensions.

The Imbalance between Content and Value

The imbalance between content and value describes the problem of teaching material content presentation. In the course of "teaching materials", it is particularly important to highlight the traditional cultural characteristics of different disciplines. In the process of teaching materials design, it is particularly critical to highlight the significance of the teaching content.⁰ In the past physical education, health education usually introduces sports health care, sports rehabilitation and other knowledge. These contents contain a large number of medical elements and are the main carrier of ISM, but they are often too theoretical. Consider that the core difference between physical education and other disciplines is that it is based on physical activity as the main means of education. Even if it is the content of health education, it is not enough to carry out teaching only in the form of theory. The proposal of ISL can promote the combination of health education with rich medical elements and physical activities, so as to better interpret the value of ISM. However, when designing ISL with the theme of ISM, it is not interdisciplinary learning in the true sense if only a link similar to health education is mechanically added before



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physical activities. Teaching materials designed in this way cannot reflect the true meaning of ISM and ISL.

The Disconnection between Different Learning Stages

Over the past 40 years of reform and opening up, remarkable achievements have been made in the construction of physical education and health textbooks, but the problem of the integration of teaching content in universities, primary and secondary schools has not been completely solved.⁰ Throughout the physical education teaching materials of various learning sections, there are difficulties such as lack of level and logic of selected items and contents.

Taking traditional sports items as an example, different learning stages of physical education teaching materials all have the problem of incoherent content structure system. It indicates the lack of content level in textbooks, directly affecting the systematic and continuous learning of students in this part. There is a certain degree of overlap in the content of items selection in different learning stages, which will also lead to the fragmentation of students' knowledge and skills learning. The lack of logic and lack of cohesion in the setting of learning stages of traditional sports content can also be found from the content setting of different versions of physical education and health textbooks. For example, the edition of People's Education Press has set Changquan, Nanquan and truncheon as martial arts items for grades 7 to 9 respectively, while the ethnic folk sports only include bamboo dance and Huajian in grade 8. Through the comparison, it can be clearly found that the longitudinal connection between the national folk sports program in the seventh grade and the ninth grade is not coherent and systematic. However, in the edition of Education Science Press, the longitudinal connection of martial arts items appeared incoherent phenomenon, and only in the seventh grade was included in the martial arts items of "nine forms of Changquan".⁰

The disconnection between different learning stages is one of the common problems in the course of teaching materials design. It is not only reflected in the teaching materials design of traditional sports materials. Therefore, for the new content of physical education and health curriculums, similar problems may also occur in the teaching materials design of ISL with the theme of ISM. It is necessary to straighten out the layout logic of teaching material content and construct an effective and reasonable bridging transition system to ensure the quality of teaching materials.

The Chasm between the Major System and the Supporting Structure

The special column setting of the teaching material is the most significant feature that distinguishes it from other publications in structure and function. Based on the different understanding and selection orientation of knowledge content presentation, the structure of teaching material columns is different. Scientific design and combination, appropriate cognitive rules for students and the priority order of subject content can maximize the effect of knowledge content presentation. Physical education teaching materials are mainly divided into two parts: the major



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system and the supporting structure. Major system refers to the main content and knowledge to be imparts in teaching. And supporting structure refers to columns such as question and communication after class, which can help students further understand and supplement the corresponding content. However, the transposition of the two systems in the current teaching material needs to be improved. Each column in the teaching material corresponds to a specific content, with a clear functional direction and irreplaceability. And the columns are not separated from each other, but integrated into an organic whole.⁰ Physical education textbooks lack of detailed materials to support students' understanding of the learning content. And the practice content involved in the textbook column is too little, which is not conducive to students' application of learning content in practice.⁰ For ISL with the theme of ISM, it should achieve the organic integration of sports and medicine to reflect its practical value. The chasm between the major system and the supporting structure will affect its practicality.

The Evaluation System: Lack of Attention to Evaluation beyond Athletic Development

Physical education learning evaluation refers to a kind of evaluation on the learning process and learning effect of students according to their specific conditions of physical education learning, including both the evaluation of students' learning process and learning results.⁰ According to the new curriculum standard, the content of learning evaluation includes the development of sports ability, the cultivation of healthy behavior and the cultivation of sports morality. However, judging from the actual teaching evaluation in the past, many primary and secondary schools still focus on the development of physical ability and other sports abilities. That is, running fast, jumping far and throwing far. Insufficient attention is paid to the evaluation of other contents.⁰ After the study of ISL with the theme of ISM, teachers should not only take the development of students' sports ability as the only standard to evaluate students' learning outcomes. The cultivation of healthy behaviors and the cultivation of sports morality also need to be included in the evaluation system. And ISL with the theme of ISM is not just about learning sports related knowledge and skills. It also includes many contents in the field of medicine. Therefore, the establishment of this part of the evaluation system needs to give more thought. And teachers can evaluate students' learning outcomes comprehensively and effectively through a reasonable evaluation system.

The Teachers' Abilities: Lack of Medical Knowledge and Comprehensive Ability in Sports and Medicine

The professional development level of physical education teachers is not only the embodiment of individual ability, but also has important significance for students' sports development and physical education learning. From the perspective of ISM, physical education teachers in the compulsory education still lack medical knowledge and comprehensive ability in sports and medicine.

Lack of Medical Knowledge



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Chinese sports instructors typically have professional skills to guide sports, according to Huang Yaru and her colleagues (Huang et al., 2015). But there is a paucity of pertinent medical and healthcare expertise.⁰ Li Jingyuan (Li, 2016) attributed this phenomenon to a robust professional medical knowledge base as the underlying cause.⁰ ISL with the theme of ISM includes both sports and medicine. Teachers will find themselves in an embarrassing situation when dealing with lesson plans that contain medical elements because they lack the necessary medical understanding. If these elements are neglected, the entire ISL with the theme of ISM will be castrated immediately. And if the teaching activities are forced to continue, it is simple to teach students incorrect information. It is clear that ISL with the theme of ISM will hinder the development due to teachers' lack of medical understanding.

Lack of Comprehensive Ability in Sports and Medicine

According to the setup of physical education majors in colleges and universities in China, physical education and subject education (physical education) are the two main majors for training physical education teachers in primary and secondary schools. However, some research pointed out that the teaching methods and content of undergraduate physical education-related degrees are clearly disconnected from the practice of physical education.⁰ The original education gradually stops meeting the needs of society as a result of the educational lag that results from social development and change.⁰ When ISM and ISL were formally proposed, the original education and training of physical education teachers in colleges and universities showed limitations. The relevant abilities of teachers need to be further cultivated. Ge Zhibin (Ge, 2020) examined the physical education specialist training programs in several universities and found that the pertinent ISM ideas were relatively nebulous.⁰ It has an impact on the development of corresponding abilities. Physical education teachers must have excellent comprehensive ability in sports and medicine in order to assist ISL with the theme of ISM, which is the primary responsibility of the physical education curriculum.

Discussion

Having reviewed the history of ISM, its evolution, and its tradition in China, we posed three potential issues with ISL with the theme of ISM through thematic analysis. In the following section, we will discuss the three basic elements and put forward corresponding suggestions.

Design Teaching Materials by Grasping the Characteristics of ISM and ISL

The design of teaching materials is more difficult than creating ordinary teaching materials because of the uniqueness of ISM and ISL. To provide implicit teaching content through explicit materials is to use them as tools for teachers and students to carry out instructional tasks. The design of teaching materials should closely correspond to the subject matter being taught. As a result, the emphasis of appropriate teaching materials is on understanding ISM and ISL characteristics. ISM is the result of the interdisciplinary integration of sports and medicine, which



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necessitates that the design of teaching materials take into account both medical and physical education-related factors.

Integrity and innovation is the main idea of teaching materials design.⁰ "Integrity" refers to the ability to understand and inherit past actions and experiences. Sports-related content is the subject of integrity for ISL with the theme of ISM. The content of the physical education component of the curriculum has extensive expertise in the production of pertinent teaching materials because it is the core and main body of the curriculum. And there are many superb designs for teaching materials that can be used as references. As a result, the content of this part can be improved upon by using references. The focus of innovation is the medical section. Integrity dictates that medically related content should be incorporated. In order to portray the internal harmony of ISM, make sure the medical content is clearly tied to the content of physical education. And it can help students to feel the multiple values of ISM.

The teaching materials' content needs to be further organized at the same time. Construct a collection of relatively extended content systems by thinking of different learning stages as distinct components of a student's overall development. As students' cognitive and motor abilities grow, we should be mindful of the integrity and coherence of our instruction, guard against the "fragmentation" of the information, and gradually raise the level of difficulty.

The relationship between physical education and medicine can guarantee the consistency of the organizational design of teacher materials and offer assistance with the transition between "major system" and "supporting structure". The overall planning of "learning objectives, project presentation, activity design, expanding knowledge, after-class evaluation, family physical education homework" and other columns, stratified design, reasonable cohesiveness to build a joint force. The present emphasis on family physical education homework can be used as a helpful addition to the primary classroom channel to completely demonstrate the practicability of the content.

Improve the Evaluation System from Multiple Dimensions

Physical education learning evaluation is not only a necessary way to know students' physical education learning effect, but also an effective means to motivate students to correct their learning attitude and improve their learning enthusiasm. In order to ensure the smooth development of ISL with the theme of ISM, improving the corresponding evaluation system is a very important step. Thus, it is important to think about two points.

One is to improve the corresponding learning evaluation standards. The traditional physical education learning evaluation is still centered on students' sports ability, while other contents are very limited. Although the development of sports ability is important, ISL with the theme of ISM has other important meanings for students, such as the mastery of health knowledge and methods, the formation of health habits and so on. Therefore, it is necessary to further build an evaluation system of



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International
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and Peace

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multiple content indicators to fully reflect the multi-dimensional value of ISL with the theme of ISM. The ability to combine medical knowledge with sports skills, the ability to combine medical knowledge with sports habits, the ability to protect sports injuries, and the ability to first aid sports injuries can be included into the evaluation system as content indicators to enrich its content.

Second, further implement multi-dimensional angle evaluation. In the evaluation system, there should be both skill evaluation and theory evaluation, process evaluation and result evaluation, teacher evaluation and student and class evaluation, in-school evaluation and out-of-school evaluation,⁴⁷ so as to achieve all-round evaluation.

Strengthen Teachers' Learning of Medical Knowledge and the Training of Comprehensive Ability in Sports and Medicine before and in Service

Training the appropriate talent team should be the top priority in order to enable the active and effective development of ISL with the theme of ISM. Physical education teachers should also be in charge of imparting knowledge and strategies for maintaining good health, according to Zhang He and Tang Yan's (Zhang and Tang, 2017) proposal.⁰ This is particularly important for ISL with the theme of ISM. As a result, Xiang Yuhong and Li Chengwei (Xiang and Li, 2017) further suggested that physical education teachers should develop their capacity to deliver health education in addition to teaching sports abilities.⁰ Physical education teachers should use medical ideas and methods to carry out physical education. Due to this, physical education teachers must possess a particular level of medical expertise.⁰ Feng Zhenwei and his colleagues (Feng et al., 2018) proposed to strengthen the development of talents with "health skills," enhance their understanding of "sports as health," and integrate "medical health teaching" into "motor skills teaching" based on the experience of collaborative governance of ISM in the United States.⁰

It is important to properly educate relevant talents both before and in service.⁰ The pre-service education stage of physical education teachers is usually the period when they receive higher education. The development of "physical-medical integration" skills is a current trend in talents training at relevant colleges and universities. Chengdu Sports University consistently stressed the value of physical education teachers' roles as well as the ability in sports health care during the teaching reform in the early 1980s. It is suggested that teaching students the knowledge and abilities of medical supervision, trauma prevention, and first aid is essential to achieving the purpose of school physical education. Additionally, it promoted the idea of cultivating applied talent of "one major with multi-capabilities".⁰ To provide students more practice scenes, colleges and universities might implement the experimental teaching method that combines physical education and medicine and design the experimental teaching place in sports training venues. Likewise, make an effort to incorporate medical theory and knowledge in the physical education lesson is needed. In order to improve the connection between ISM and the real situations, Jin Chen and her colleagues (Jin et



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International
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of Sport
for Development
and Peace

The 5th International Conference of Sport for Development and Peace in Collaboration with 2022 International Conference of Sport History and Culture

al., 2018) recommended the implementation of ISM specialized education, which combines physical education and medicine in practice (such as clinical practice, clinical management, clinical diagnosis, and so forth carried out in developed countries).⁰ Physical education teachers' in-service education typically takes the form of centralized teacher training, academic activities, and school-based research and study. While physical education teachers' ability to educate is developed further, the comprehensive ability in sports and medical knowledge should also be bolstered. In-service education is a crucial opportunity for physical education teachers who have been on the front lines to comprehend and study the relevant ISM theory and develop their all-around athletic and medical skills.

Future Research Prospects

According to Yang Wenxuan and Zhang Xiqian (Yang and Zhang, 2015), the implementation of physical education and health curriculum should be effective and efficient in the context of the new era.⁰ To achieve this goal, many theoretical and practical problems in this field need to be further explored. Teachers, teaching materials and students are the three elements of teaching activities. But in today's China, the research on education generally focuses on the first two. The points discussed in this paper also belong to the level of teachers and teaching materials. Owing to the students' personality and many complicated factors, it is relatively difficult and lack of research and discussion on student level. But for the teaching activities, the grasp of the elements and relationships between the three elements of processing is very important. Therefore, not only ISL with the theme of ISM, but all teaching activities require a deeper understanding of the element of students. In the future, more research and analysis are needed on the impact of students on the development of ISL with the theme of ISM.

Conclusion

Since the United States put forward ISM, many countries have joined the ranks of ISM research. With the extensive attempts of developing ISM in the country, ISM gradually moved from the theoretical level to the practical level. And the relationship between ISM and physical education and physical education curriculum is studied deeply by Chinese scholars. This paper reviews the origin and development of ISM and the research on ISM in China, and discusses three problems that may arise in the process of ISL with ISM as the theme (teaching material design, evaluation system construction and teacher's abilities), aiming to provide a new direction for the corresponding stage of physical education. And put forward the following three suggestions: design teaching materials by grasping the characteristics of ISM and ISL, improve the evaluation system from multiple dimensions and strengthen teachers' learning of medical knowledge and the training of comprehensive ability in sports and medicine before and in service. It is believed that ISL with the theme of ISM will bring richer connotation to school physical education in the future.



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