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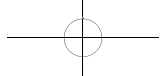
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## Education Reform and Development

### Focus and Scope

*Educational Reform and Development* is a peer-reviewed, open-access international professional academic journal. The column of *Educational Reform and Development* includes comments, basic researches, literature reviews and research letters. Manuscripts should be scientifically advanced, readable and practical, with prominent points, concise words, reliable data, standard writing and accurate expression. The main readers of this journal are principals, teachers, education administrators, education researchers, and domestic and foreign researchers concerned with adolescent education.

*Education Reform and Development* mainly reflects the latest development and scientific research achievements of education, explores the rules of education, promotes academic exchanges at home and abroad, and serves for deepening educational reform and prospering educational science.

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- Feasibility Analysis of Innovative Teaching Methods
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# Research on the Innovation of Ideological and Political Teaching Model in College Physical Education Driven by the OBE Concept

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**Abstract:** With the continuous development and progress of society, college physical education courses are no longer merely platforms for physical exercise and skill instruction. In the new era, they have been entrusted with more educational missions, one of which is ideological and political education. The Party Central Committee has always attached great importance to the construction of ideological and political courses in schools as a key part of educational work. On the new journey of the new era, the construction of ideological and political courses faces new situations and tasks, and thus must show new vitality and achievements. However, in the field of physical education, how to effectively implement the concept of ideological and political courses has become a tough issue for physical education educators. Based on this, this paper focuses on the construction of ideological and political elements in college physical education under the OBE concept, aiming to promote the smooth development of college physical education reform.

**Keywords:** OBE concept; College physical education; Curriculum ideology and politics; Teaching model innovation

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## 1. Background of the innovation of the ideological and political teaching model in college physical education under the OBE concept

### 1.1. Overview of the OBE concept

The OBE (Outcome-Based Education) concept, also known as outcome-oriented education, competency-oriented education, goal-oriented education, or demand-oriented education, is an educational model based on learning outcomes and oriented towards learning achievements. It is highly consistent with ideological and political education in colleges and universities. In line with the requirements of the new-era society for the goals of ideological and political education in colleges and universities, the OBE concept can be used to construct an effective, practical education system for physical education majors <sup>[1]</sup>.



## 1.2. Overview of ideological and political education in physical education courses

Ideological and political education in physical education (PE) is a complex and systematic project, as well as a conceptual reform and reconstruction in the field of PE education and teaching. Its implementation involves various aspects, thus requiring enhanced top-level design and systematic advancement <sup>[2]</sup>. Meanwhile, the fundamental goal of developing ideological and political education in PE courses is to return to the original aspiration, revert to the essence of education and PE itself. PE educators must fulfill their responsibilities and missions of “imparting knowledge, educating people, and resolving doubts” to effectively promote the development of ideological and political education in courses.

First, from the perspective of tracing origins and clarifying fundamentals, PE aims to realize the socialized moral education of the complete person through physical activities, and it inherently contains moral and ideological-political elements <sup>[3]</sup>. In the context of the new era, ideological and political education in PE courses refers to the integration of ideological and political education into the concepts, tasks, methods, and processes of the school talent cultivation system. It puts forward new requirements for how PE courses can achieve the goal of “fostering virtue through education”. This education model is neither a simple addition of PE and ideological-political education nor the “ideological-politicization” of PE classes; instead, it is the mutual infiltration of the two, integrating the imparting of sports knowledge and skills, the cultivation of sports ability, and value shaping.

Second, it is essential not to deviate from the “health first” concept of PE courses. The cultivation of personality and willpower should be carried out on the premise of enhancing physical fitness and acquiring skills <sup>[4]</sup>. At the same time, PE courses inherently possess ideological-political elements and moral education functions, which need to be naturally generated and perceived by learners through teaching interactions—specifically, through physical teaching interactions and the practice of physical skills. Third, the difficulties in developing ideological and political education in PE courses mainly involve aspects such as precise support of typical cases, design of teaching evaluation standards, implementation of research results, and innovation of research methods.

Finally, the key to developing ideological and political education in PE courses lies in educators, the focus is on courses, the priority is on integrated advancement across primary, secondary, and tertiary education, the guidance is on evaluation, and the guarantee is on mechanisms. Educators should set an example, improve their awareness and ability of ideological and political education in courses, integrate ideological and political education into life, study, and communication, and play a guiding role to enable ideological and political concepts to be internalized in college students’ minds and externalized in their actions <sup>[5]</sup>.

## 2. Current status of ideological and political education reform in university physical education courses

The General Office of the CPC Central Committee and the General Office of the State Council issued *Several Opinions on Deepening the Reform and Innovation of Ideological and Political Theory Courses in Schools in the New Era*, which further promotes the integration of the Party’s innovative theories in the new era into textbooks, classrooms, and the minds of college students, and embeds core socialist values throughout the entire national education process. The organic integration of physical education courses and ideological and political education is an innovative educational concept, aiming to cultivate college students’ comprehensive quality, promote their all-round development, and achieve multiple effects of educational goals <sup>[6]</sup>.

## **2.1. Reform directions of ideological and political education in university physical education courses**

Firstly, ideological and political education in physical education courses should focus on the fundamental issue of teaching content. Centering on the goal of “integrating knowledge imparting with value guidance”, it is necessary to deeply explore the ideological and political elements contained in the courses in combination with physical education teaching content, strengthen college students’ understanding of core socialist values, and reasonably apply Marxist methodology to guide practice. Integrating China’s sports development history, Olympic stories, gold medal achievements, and the stories of Chinese athletes into school physical education helps give play to the role of university physical education in “fostering virtue through education” and cultivate college students’ comprehensive literacy<sup>[7]</sup>.

Secondly, ideological and political education in physical education courses should clarify the core issue of teaching objectives. Physical education courses need to break through the traditional limitations of “competitiveness-oriented” teaching content, “one-size-fits-all” teaching organization, and “uniform” quantitative evaluation. Physical education should take “ideological and political education through courses” as the goal, enabling education to return to the essence of “imparting knowledge and educating people”. “Fostering virtue through education” is an era-appropriate response to the fundamental issue of higher education under the leadership of the Party. Elements embodied in sports, such as moral cultivation, cultural literacy, self-discipline, self-improvement, tenacious struggle, and competitive awareness, should be fully integrated into physical education classroom teaching.

Thirdly, ideological and political education in physical education courses should solve the key issue of teaching paths. Efforts should be made to advance the construction of teaching staff and comprehensively improve the ability of physical education educators to carry out ideological and political education through courses<sup>[8]</sup>. As the main implementers of ideological and political education through courses, physical education educators should transform their educational concepts, combine earnest teaching with self-cultivation, and strive to be “models of learning and behavior”. They should promote physical education reform through their own words and deeds, physical education content, organization of sports activities, and physical education evaluation systems. Meanwhile, the integration of the first classroom (formal classroom teaching) and the second classroom (extracurricular practical activities) should be strengthened, enabling college students to apply the theoretical knowledge they have learned to practice and realize the integration of knowledge, skills, and values.

## **2.2. Dilemmas in the ideological and political reform of college physical education courses**

First, the ideological and political education capacity of the teaching staff in physical education courses. Physical education educators have insufficient professional competence in ideological and political education integrated into courses, and their educational philosophy needs to be updated. They lack the spirit of innovation, and the talent cultivation concept that integrates physical education teaching with ideological and political education is not clear. Physical education teaching still focuses on skill imparting, lacks the application of diverse teaching methods, fails to effectively stimulate college students’ interest and enthusiasm in learning, and thus cannot give full play to the educational role of ideological and political elements in physical education courses<sup>[9]</sup>.

Second, the excavation of ideological and political elements in physical education courses. The implementation of ideological and political education integrated into courses requires in-depth exploration of physical education course content to identify the ideological and political elements contained in the discipline, as well as re-understanding, reconstruction and recreation of the course content. However, in current practice,

there is a lack of theoretical understanding, method guidance and path analysis from the perspective of the physical education discipline. In physical education teaching, it is difficult to find entry points for integrating teaching content with ideological and political education, and there is a lack of discipline-specific characteristics, systematicness and practicality, leading to the problems of emptiness, one-sidedness, and mechanization in the excavation of ideological and political elements in physical education courses.

Third, the collaborative education mechanism in teaching management<sup>[10]</sup>. The integrated development of physical education teaching and ideological and political education requires a curriculum integration mechanism and emphasizes the coordination and cooperation between the two disciplines. Due to disciplinary division and inadequate management, physical education courses and ideological and political education fail to give full play to the synergistic effect in teaching objectives, and there is a lack of communication between them<sup>[11]</sup>. At the same time, the digital level of teaching management inside and outside physical education classrooms is low, and a sound collaborative education mechanism has not been established for college students' in-class learning, after-class training, competitions and other activities.

### **3. Innovative strategies for the teaching model of ideological and political education in college physical education courses under the OBE concept**

#### **3.1. Integrating the OBE concept into the construction of the ideological and political system of college physical education courses**

##### **3.1.1. Building an integrated pattern to activate the core engine of practical education**

Focus on top-level design and overall planning, and in-depth study of policy documents, such as opinions on the ideological and political work of college physical education courses and the construction of ideological and political work systems. Centering on the fundamental task of fostering virtue through education, take practical education as the starting point, strengthen physical education teachers' awareness and responsibility of education, gather educational synergy through multi-subject participation, and build an integrated pattern of ideological and political education in physical education involving college party and government leaders, professional educators, counselors, and college student cadres<sup>[12]</sup>.

##### **3.1.2. Strengthening “Two Wings” to create a booster for practical education**

On one hand, persistently cultivate a good academic atmosphere, focus on strengthening the core work of academic atmosphere construction, and promote college students' growth and development. Carry out ideological and political construction activities for physical education courses from five dimensions: management, service, examination style, platform, and role models. Clarify the direction and focus of ideological and political construction, and ensure the implementation of ideological and political work. On the other hand, take physical training as an opportunity and an important means to promote practical education. Carry out training activities of different levels and types based on the content of characteristic physical education majors in colleges and universities, and strengthen college students' awareness of “using theory to guide practice and promoting theoretical learning through practice”. Taking improving the quality of employment in the sports field as the entry point, accurately grasp the characteristics of college students' own development needs, and implement progressive employment practice education. Jointly build physical training bases and social practice bases, carry out ideological and political education in sports that guides values and employment concepts, enhance college students' employment awareness, and strengthen their learning motivation and pertinence.

### **3.1.3. Consolidating “Three Supports” to accelerate practical education**

First, build a platform for Party-building-led education<sup>[13]</sup>. Guided by Party building, we will innovate new models of organizational education, further deepen the Party building work among college students, improve the carriers for college students’ self-education, self-management and self-service, and bridge the “last mile” in college students’ Party building and ideological and political work.

Second, establish an academic guidance support platform. We will build a “mentality guidance, academic guidance, and career navigation” integrated education model through academic guidance-oriented associations to do practical things for college students. A guidance team for ideological and political construction of physical education courses will be formed, consisting of “academic mentors + peer mentors + college student class teachers + educator class teachers + counselors” to achieve full-staff education; innovate the curriculum guidance model of “course-opening guidance + in-class guidance + characteristic activities” to realize whole-process education; and build an “online + offline” physical training guidance platform to achieve all-round education. Through classified guidance and precise services, we will leverage the advantages of collaborative education and establish a long-term mechanism.

Third, set up an innovation and entrepreneurship support platform. We will explore the “creativity-innovation-entrepreneurship” model, improve the innovation and entrepreneurship platform and security system, expand channels for innovation and entrepreneurship education by relying on national, provincial, municipal and university-level innovation and entrepreneurship competitions as well as sports skills training competitions, foster a strong atmosphere for innovation and entrepreneurship, and provide high-quality conditions for cultivating high-level sports talents.

## **3.2. Empowering the ideological and political construction of university physical education courses with the Chinese sports spirit**

### **3.2.1. Exploring elements of ideological and political education in courses**

The striving figures on the Olympic arena and the sweat of youth on campus playgrounds—the Chinese Sports Spirit has inspired and nurtured generations of people. It is not only the internal driving force for the development of Chinese sports but also an important spiritual pillar for realizing the great rejuvenation of the Chinese nation. In this regard, university physical education educators should deeply explore the connotation of “strengthening morality and mastering skills” embodied by the Chinese Sports Spirit in the ideological and political construction of physical education courses, to achieve the unification of college students’ moral improvement and sports skill enhancement, enabling them to acquire practical abilities that promote their socialization through physical education courses. By integrating the Chinese Sports Spirit into curriculum design in an orderly manner, it helps college students clarify the learning content and process of physical education courses, assists educators in grasping the key points and directions of ideological and political teaching in physical education, promotes teaching practice and reflection, and facilitates the development of educators’ ability in ideological and political teaching.

First, educators reorganize the content knowledge system and framework of physical education courses, analyze the ideological and political elements contained in the courses, take this as a starting point, and then integrate relevant resources of the Chinese Sports Spirit into the curriculum design process. Second, on the basis of identifying the ideological and political elements of physical education courses, further clarify the concept of curriculum design, give play to the important role of the Chinese Sports Spirit in leading and promoting ability development, and form a “three-stage and five-competence” target system<sup>[14]</sup>. Third, through story teaching



method, case teaching method, situational teaching method, and “Olympic champions entering the classroom” activities, the Chinese Sports Spirit is integrated into pre-class, in-class, and after-class links in an orderly manner, allowing college students to master the course knowledge while imperceptibly cultivating their striving spirit of diligence and perseverance. Finally, through college students’ self-evaluation, mutual evaluation, and educators’ evaluation, the emotional attitudes and behavioral performances of college students in the learning process are evaluated, so as to assess the learning effect of ideological and political education and further judge the value manifestation of integrating the Chinese Sports Spirit into curriculum design.

### **3.2.2. Strengthening the construction of physical education faculty**

To better integrate the Chinese Sports Spirit into the ideological and political construction of physical education courses, universities have innovatively launched “Chinese Sports Spirit Study Camps” targeting educators’ cognitive and literacy shortcomings. Through systematic theme design, diversified practice paths, and professional faculty allocation, spiritual nutrients are transformed into practical educational effects.

In the theoretical learning module, universities invite experts in sports culture and ideological and political education to give a series of lectures, which deeply analyze the origin, connotation, and contemporary value of the Chinese Sports Spirit, and strengthen educators’ understanding of core spirits such as patriotism, dedication, striving, and transcendence. In the traditional project experience module, inheritors of traditional sports such as martial arts, archery, dragon and lion dancing conduct on-site teaching, allowing educators to comprehend the cultural genes of “establishing oneself with ritual” and “being vigorous and promising” through immersive practice. In the event observation and volunteer service module, educators are organized to observe sports events inside and outside the university to analyze the striving spirit demonstrated by athletes<sup>[15]</sup>. Voluntary services for integrating sports and education at the grassroots level are carried out to guide educators to understand the integration path of sports spirit and ideological and political education in practice.

Universities emphasize a diversified faculty composition, including front-line physical education educators, ideological and political educators, as well as invited off-campus sports culture experts and inheritors of traditional sports. They give full play to their respective strengths and jointly take responsibility for integrating key ideological and political elements into the content and practice of university physical education courses. At the same time, in accordance with the teaching requirements and characteristics of university physical education courses, regular training and assessment are conducted for front-line educators, covering content such as the latest research results of the Chinese Sports Spirit, teaching methods and strategies of ideological and political education in physical education courses, and teaching skills of traditional sports projects, to continuously update their knowledge structure and improve teaching quality. In this way, educators have gradually broken the dilemma of “forced integration” and explored characteristic educational models such as cultivating patriotic feelings in physical education teaching and analyzing the striving spirit in event observation, making the Chinese Sports Spirit a “spiritual calcium tablet” for college students’ growth and helping cultivate a new generation of young people with ambition, backbone, and confidence.

## **4. Conclusion**

In summary, exploring the practical path of ideological and political education in university physical education courses under the OBE (Outcome-Based Education) concept is an in-depth study and reflection on the practice of ideological and political education in university physical education courses. This paper mainly analyzes the

focus, blocking points, and difficulties in the construction of ideological and political education in physical education courses, providing certain inspiration for clarifying the paths and strategies of future construction. By strengthening the integration of physical education courses and ideological and political education, focusing on the personalized training of college students, and establishing a diversified evaluation mechanism, we will promote the development of ideological and political education in university physical education courses, contribute to cultivating builders and successors of socialism, and boost the high-quality development of the sports discipline.

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# The Current Situation and Promotion Strategies of the Application of Digital Teaching Platforms in Higher Vocational Colleges

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**Abstract:** With the in-depth advancement of educational reform, classroom teaching in higher vocational colleges should be further optimized. Teachers are expected to proactively adopt new educational philosophies and teaching methods to better stimulate students' interest, enhance their understanding and application of the knowledge they have learned, and improve the effectiveness of talent cultivation. The application of digital teaching platforms can greatly enrich the content of classroom teaching in higher vocational colleges, expand the channels of talent cultivation, and play a significant role in promoting the all-around development of students. In view of this, this paper analyzes the application of digital teaching platforms in higher vocational colleges and puts forward some strategies, which are for reference only by colleagues in the field.

**Keywords:** Higher vocational colleges; Digital platforms; Application; Strategies

**Online publication:** November 3, 2025

## 1. Analysis of the application value of digital teaching platforms in higher vocational colleges

### 1.1. Conducive to enhancing the appeal of courses

The rational application of digital teaching platforms in classroom teaching of higher vocational colleges can greatly enrich educational resources, which plays a crucial role in improving the effectiveness of future classroom teaching and enhancing the appeal of course knowledge to students. Through the proper use of digital platforms, students' initiative in participating in knowledge exploration and learning can be significantly boosted, which is of great significance for improving the quality of talent cultivation<sup>[1]</sup>. With the assistance of digital platforms, the interest of classroom teaching in higher vocational colleges will be further enhanced. This enables students to understand the connotation of the knowledge they have learned more intuitively and in-depth, thereby improving their depth of understanding and learning initiative.



## **1.2. Conducive to improving the timeliness of teaching**

When conducting classroom teaching in higher vocational colleges, teachers should attach importance to the full implementation of teaching content. While students are learning knowledge, teachers should help them develop good comprehensive abilities and literacy, to assist them in achieving the goal of “mastering the objectives of the class and digesting the knowledge in the same class”<sup>[2]</sup>. For this purpose, teachers should be good at integrating digital platforms into classroom teaching, to further optimize and expand the teaching content, enhance the interactivity and scientificity of teaching, enable students to conduct in-depth knowledge learning based on digital resources, strengthen the effectiveness of classroom teaching activities, and contribute to the further improvement of classroom teaching quality.

## **1.3. Conducive to enhancing the flexibility of education**

In the traditional classroom teaching of higher vocational colleges, teachers mostly adopt the cramming teaching method. This may make it difficult for some students to understand the knowledge they have learned, and even cause them to have negative psychological responses, such as resistance and disgust, which greatly hinder the improvement of classroom teaching effectiveness. The application of digital platforms in higher vocational classrooms can effectively enhance the interest and flexibility of classroom teaching. Teachers can carry out teaching activities by using media video resources, micro-lecture resources, and other methods, which greatly promotes the improvement of the flexibility of classroom teaching in higher vocational colleges and can better attract students' attention<sup>[3]</sup>. By applying digital platforms to the classroom teaching of higher vocational colleges, the existing teaching content, forms and paths can be further optimized and expanded, a better learning platform can be created for students, and the effectiveness of classroom teaching can be improved.

# **2. Analysis of the current situation of classroom teaching in higher vocational colleges**

## **2.1. Insufficient learning interest**

To further improve the effectiveness of classroom teaching in higher vocational colleges, teachers should attach importance to effectively stimulating students' learning interest, which plays a significant role in enhancing the quality of talent cultivation. However, at present, many students have not developed a strong sense of initiative in knowledge learning, which greatly hinders the improvement of their learning efficiency. In classroom teaching, many students are distracted, whisper to each other, and engage in other such behaviors. This not only affects students' learning efficiency but also subtly impacts teachers' teaching mentality<sup>[4]</sup>. The reasons for this problem can be analyzed from two aspects: First, students have not clearly recognized the value of learning the course knowledge and lack clear learning goals, which subtly exerts a negative impact on their interest in knowledge learning. Second, insufficient prior knowledge reserve. Some students have inadequate knowledge reserves and learning abilities, which leads to a sense of dread when they learn knowledge. This, in turn, affects the efficiency and quality of their exploration of course knowledge and hinders the development of their learning interest.

## **2.2. Outdated teaching modes**

In the traditional teaching of higher vocational courses, many teachers adopt a cramming-style teaching method. This makes it difficult for them to effectively expand the existing teaching content, thereby hindering students from building a more comprehensive knowledge system and being extremely detrimental to their future development<sup>[5]</sup>. In addition, in the traditional classroom teaching of higher vocational colleges, students'

efficiency in learning and understanding knowledge is relatively low, which also subtly affects the efficiency and quality of higher vocational course teaching. For students, a good learning atmosphere is the key to improving learning efficiency. A single and rigid classroom teaching environment will greatly hinder the generation and development of students' learning interest, thus exerting a great hindrance to the subsequent implementation of teaching practice activities.

### **2.3. Unreasonable course content**

Currently, some teachers in higher vocational colleges have not attached importance to students' long-term development when conducting classroom teaching. This leads to deficiencies in their course design, teaching design, and other related activities, thereby exerting a significant negative impact on teaching effectiveness<sup>[6]</sup>. At this stage, when implementing classroom teaching in higher vocational colleges, some teachers focus most of their energy on explaining content such as vocabulary and theories, while rarely combining real-life situations to conduct an in-depth analysis of the knowledge being taught. This greatly affects students' efficiency in learning knowledge and hinders their understanding of more in-depth knowledge, and the improvement of their learning efficiency in subsequent studies. In addition, in the traditional classroom teaching of higher vocational colleges, few teachers can reasonably apply digital resources to classroom teaching design, which to a large extent, affects the richness and interest of course teaching and is not conducive to the improvement of students' learning quality.

## **3. Application strategies of digital teaching platforms in higher vocational colleges**

### **3.1. Skillfully using micro-course resources for the introduction to stimulate students' interest**

The rational application of digital platforms in classroom teaching of higher vocational colleges can effectively stimulate students' interest in knowledge learning and lay a solid foundation for the development of subsequent teaching work. For this purpose, teachers should do a good job in pre-class introduction and use digital micro-course platforms to help students better focus their attention on the classroom, thereby significantly improving teaching effectiveness<sup>[7]</sup>. In the traditional classroom teaching of higher vocational colleges, few teachers paid attention to this work. They usually asked students to read textbooks by themselves before class to help them gain a certain understanding of the knowledge to be learned, and then started the teaching process. Teaching under this model is not conducive to students focusing their attention on the classroom at the beginning of the course, which greatly affects the improvement of teaching effectiveness. Therefore, teachers should try to introduce digital resources and play some micro-courses for students before class to better arouse their curiosity in exploring knowledge, which can also provide support for the development of subsequent classroom teaching work<sup>[8]</sup>.

For example, when teaching some key knowledge points, teachers can design a micro-course for students. Through this micro-course, students can understand the key knowledge content from different perspectives and directions, thereby further enriching the teaching content and stimulating their interest in knowledge learning. Using micro-course resources for classroom introduction can better attract students' attention to knowledge learning, enable them to have stronger learning initiative in subsequent studies, and this is of great significance for improving the effectiveness of talent cultivation.

### **3.2. Introducing media video resources to enrich teaching content**

With the deepening of educational reform, the knowledge content in higher vocational teaching materials has

become more diverse and abundant. However, students have limited comprehension abilities, which may lead to difficulties in understanding certain knowledge points. This greatly hinders the improvement of classroom teaching effectiveness. Additionally, due to the limited space of teaching materials, the introduction of some knowledge points is incomplete, which impedes the formation and development of students' comprehensive knowledge systems<sup>[9]</sup>. Meanwhile, in traditional classroom teaching, few teachers can reasonably use digital platforms for auxiliary teaching, which adversely affects the enhancement of teaching effectiveness in higher vocational colleges. To address this, teachers can try to rationally apply digital media resources in the classroom teaching of higher vocational colleges. This helps further expand the teaching content, enabling students at different levels to understand the corresponding knowledge. In this way, digital media video resources can play a more significant role in classroom teaching of higher vocational colleges<sup>[10]</sup>. By introducing more digital media video resources that meet students' actual learning needs, the teaching content can be effectively expanded, making students' knowledge systems more reasonable and comprehensive. This greatly promotes their subsequent mastery of more in-depth knowledge.

For example, during teaching, teachers can use media videos for auxiliary teaching in combination with digital platforms. Before class, they can search for videos, pictures and other materials related to the teaching content online, integrate them into video resources, and play them for students using media equipment. While playing the videos, teachers can raise questions about these media video resources<sup>[11]</sup>. In response to these questions, students should watch the media videos carefully and think. After the video playback, students can discuss based on the digital video resources in class, which helps them develop a deeper understanding of the knowledge they have learned.

### **3.3. Building a digital self-learning platform to cultivate self-learning habits**

To further improve the effectiveness of digital teaching platform applications in higher vocational colleges, teachers should focus on cultivating students' self-learning abilities during the teaching process. By helping students develop self-learning habits, they can participate more proactively and actively in reviewing and previewing knowledge, which greatly promotes the improvement of students' knowledge mastery<sup>[12]</sup>. However, in traditional classroom teaching, few students take the initiative to engage in self-learning. The main reason is that they lack a proper self-learning platform. If students encounter problems during self-learning, it is difficult for them to solve these problems quickly. This not only severely hinders the progress of their self-learning activities but also affects their confidence in self-learning, making it difficult for them to develop self-learning habits.

Therefore, teachers can rationally apply digital resources in classroom teaching according to actual situations, and on this basis, build a digital self-learning platform. This allows students to conduct more efficient independent learning with the support of digital resources. When students encounter problems during self-learning, they can use digital resources to conduct in-depth exploration and analysis of the problems. They can also communicate with classmates and teachers via the digital platform. This significantly improves the efficiency of problem-solving, ensures the smooth progress of their self-learning activities, and enhances the classroom teaching effectiveness of higher vocational colleges.

### **3.4. Organizing digital classroom activities to deepen students' understanding**

In the traditional classroom teaching of higher vocational colleges, some students may be distracted, whisper to each other, or engage in other such behaviors. These issues pose significant obstacles to improving teaching

effectiveness. Faced with this situation, teachers should not simply adopt a repressive attitude, as this is of little help in solving the actual problem <sup>[13]</sup>. Instead, teachers can try to rationally apply digital resources in the classroom teaching of higher vocational colleges to better address this problem. Before launching digital classroom activities, teachers should first analyze factors such as students' existing knowledge reserves and cognitive characteristics, and then divide students into different groups. This grouping method can greatly enhance students' practical abilities during the digital classroom activities. After reasonable grouping, teachers can introduce digital resources into the classroom teaching of higher vocational colleges and guide students to carry out corresponding practical activities based on these resources. This approach helps improve students' autonomy and inquiry skills in learning, thereby further developing their comprehension abilities.

For example, during teaching, teachers can introduce certain digital resources into the classroom and then organize students to conduct practical activities. Teachers can use PPT to explain the main content of the textbook, and then divide students into appropriate groups. After grouping, students can choose roles they want to play based on their own understanding of the teaching content and watch relevant media videos. Additionally, teachers can organize students to perform on the podium. Such performances help students gain a deeper understanding of the connotation of the knowledge they have learned. Through such classroom activities, students' enthusiasm for independent learning can be effectively stimulated, encouraging them to more actively engage in exploring knowledge in class. This plays an important role that cannot be ignored in deepening their comprehension abilities and improving their knowledge systems.

### **3.5. Enrich digital teaching material content and improve the knowledge system**

When applying digital platforms to classroom teaching in higher vocational colleges, teachers should attach sufficient importance to teaching materials. High-quality teaching materials can significantly improve the efficiency of teachers' education. To this end, teachers can select appropriate digital resources as supplements based on students' characteristics, integrate them with teaching materials, and create digital teaching materials to deeply combine students' actual learning needs with the content of teaching materials, laying a solid foundation for their long-term development in the future <sup>[14]</sup>. When integrating digital resources into higher vocational teaching materials, teachers should pay attention to the practicality of knowledge and incorporate content that is helpful for students' real-life situations into digital teaching materials, which will greatly promote students' long-term development afterwards. In classroom teaching of higher vocational colleges, teachers can conduct in-depth analysis of digital resources and start from different angles and levels to meet students' diverse learning needs. In addition, considering the rich and varied classroom teaching content in higher vocational colleges, teachers can match digital teaching materials with corresponding videos, pictures, audios and other content, to further improve and optimize the content of teaching materials <sup>[15]</sup>. Furthermore, teachers should attach importance to the work of revising, deleting and updating digital teaching materials to ensure that the content of digital teaching materials is consistent with students' actual learning needs, meets the development requirements of the times, and helps to further improve the quality of classroom teaching in higher vocational colleges.

## **4. Conclusion**

To sum up, if we want to improve the application level of digital teaching platforms in higher vocational colleges, teachers can start from aspects such as skillfully using micro-courses for introduction to stimulate students' interest, introducing media videos to enrich teaching content, building self-study platforms to cultivate students'



self-study habits, organizing information-based classroom activities to deepen students' understanding, and enriching teaching material content to improve the knowledge system. Through these measures, the application quality of digital teaching platforms in higher vocational colleges can be imperceptibly raised to a new level.

## Disclosure statement

The author declares no conflict of interest.

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# Analysis on the Current Situation and Improvement Countermeasures of Art Design Education in Colleges and Universities under the Background of AIGC Technology

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**Abstract:** Against the backdrop of the digital and intelligent era, the integration of Generative Artificial Intelligence (AIGC) and higher education is deepening. Particularly in art design education in colleges and universities, the application of AIGC can automatically generate graphic designs, copywriting, and artistic posters, etc. This is conducive to providing students with new ideas for creative design and practice, thereby achieving the goals of improving teaching quality and efficiency. Based on this, this paper, taking AIGC technology as the background, analyzes the impact of AIGC technology on the development of the art design industry, expounds on the current problems and improvement countermeasures of art design education in colleges and universities under the background of AIGC technology. It aims to better promote the digital transformation of art design education reform in colleges and universities, and hopes to provide some references for peers.

**Keywords:** AIGC technology; Colleges and universities; Art design education; Current situation of problems; Improvement countermeasures

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## 1. Introduction

Nowadays, from image generation, music creation to interactive design, the application of AIGC technology is gradually changing the methods and processes of artistic creation<sup>[1]</sup>. Under this situation, as an important base for cultivating professional talents in art design, colleges and universities must keep up with the development pace of the times, reconstruct teaching models, and improve teaching effectiveness to help students better adapt to the digital and intelligent era. Therefore, this paper mainly conducts relevant analysis and research on the teaching reform of art design education in colleges and universities under the background of AIGC technology,

for reference only.

## **2. The impact of AIGC technology on the development of the art and design industry**

### **2.1. AIGC technology can transform traditional artistic creation processes**

In traditional art creation, designers mostly rely on their personal experience and manual skills to create works, emphasizing the originality of the creative concept and the uniqueness of handcraftsmanship <sup>[2]</sup>. The entire process usually takes a long time, while the diversity and efficiency of creation are relatively low, and some innovative ideas are difficult to perfectly present. However, if AIGC technology is introduced in this process, art designers can use artificial intelligence algorithms to quickly generate multiple art design schemes, and can also carry out iterative optimization according to actual conditions and requirements, thereby designing more high-quality creative works in a short period of time <sup>[3]</sup>. Therefore, from this perspective, the effective application of AIGC technology in the field of art design can greatly change the process of traditional art creation. This also reflects that when cultivating talents majoring in art design, colleges and universities should not only require students to master a solid foundation of professional theories, develop their solid professional practical skills and good professional literacy, but also enable them to acquire certain artificial intelligence application capabilities and innovative thinking. Only in this way can students better adapt to the development requirements of the art design industry in the background of AIGC technology.

### **2.2. AIGC technology can promote changes in the art and design industry**

Under the background of AIGC technology, the working methods and market demands of the art and design industry have undergone obvious changes. Specifically, on the one hand, in terms of working methods, the emergence of various digital art works, the introduction of smart contracts, and market reforms based on modern technological means such as artificial intelligence, blockchain, and big data have provided a good opportunity for the application of AIGC technology in the field of art and design, and also provided a better intellectual property protection mechanism for the creation of art designers. On the other hand, in terms of market demand, the application of AIGC technology has also spawned many new positions, such as AI art generator and AI interaction design engineer. This requires relevant practitioners to have not only solid art and design capabilities, but also certain data analysis capabilities and programming skills, to effectively ensure that they stand out in the highly competitive job market <sup>[4]</sup>.

## **3. Current issues in higher education of art and design against the backdrop of AIGC technology**

Against the backdrop of AIGC technology, there are still some problems in the application of AIGC technology in current higher education of art and design, which are mainly manifested in the following aspects:

### **(1) The educational and teaching philosophy needs to be updated**

Influenced by traditional teaching concepts, some teachers focus more on cultivating students' professional theoretical knowledge and practical skills when formulating talent training programs and setting up related courses for art and design majors, without integrating content related to AIGC technology, big data analysis, and computer learning. This easily leads to a disconnect between what



students learn and cutting-edge technologies of the times as well as the actual needs of the art and design industry, which is not conducive to students' future employment and career development<sup>[5]</sup>.

(2) The teaching content is relatively outdated

Currently, many teachers of art and design majors in colleges and universities still teach students relevant knowledge and skills in accordance with the requirements of textbooks and syllabi. Although this content is updated regularly, the speed of update is far from keeping up with the iteration speed of technologies in the current art and design industry. This easily results in students learning relatively backward content, ultimately making it difficult for them to meet the talent needs of the current art and design industry<sup>[6]</sup>.

(3) The teaching methods are relatively simple

The rapid development of AIGC technology has had a profound impact on the traditional art and design industry and its educational model. However, some teachers have doubts about the application of AIGC technology, and in addition, some schools have insufficient investment in introducing new technologies and updating teaching equipment, which easily leads to uneven levels of application of AIGC technology among teachers<sup>[7]</sup>. Therefore, at present, teaching in art and design majors in colleges and universities is still mostly theory-based, lacking corresponding practice, and unable to skillfully apply AIGC technology in teaching.

(4) Teachers' ability to use new technologies, such as AIGC technology, is insufficient

With the continuous development and popularization of modern science and technology, a new generation of technical means including AIGC technology has now become an important auxiliary tool for the reform and development of various industries. Therefore, this requires teachers to not only have solid professional ability, teaching ability and high professional quality, but also be able to skillfully use technical means such as AIGC to carry out teaching and provide relevant practical guidance for students<sup>[8]</sup>. However, currently, many colleges and universities have insufficient attention to the ability of art and design teachers to use new technologies; for example, some art and design teachers in colleges and universities have low awareness and ability of digital and information-based teaching, and some teachers cannot actively and in-depth learn new technologies and concepts in the industry, thus making the overall teaching unable to fully meet the requirements of modern education.

## **4. Improvement strategies for higher education in art and design under the background of AIGC technology**

### **4.1. Updating the teaching philosophy of art and design**

In traditional art and design education in colleges and universities, the teaching methods adopted by teachers are mostly lecture-based and cramming-style, and are limited to offline in-class instruction<sup>[9]</sup>. Such teaching not only struggles to fully meet the personalized and diversified learning needs of students at different levels, but also restricts the development of students' innovative thinking and practical abilities to a certain extent. Against the backdrop of AIGC technology, the update speed of new concepts and technologies in the art and design industry will inevitably accelerate. For art and design students, they can also use AIGC to obtain desired learning resources, engage in design practice, and even widely disseminate relevant knowledge, which will greatly blur the boundary between teachers and students. If teachers fail to timely transform their educational and teaching philosophies and methods, it will inevitably affect students' learning and even their future career development. Specifically, teachers of art and design majors in colleges and universities should establish sound

digital-intelligent teaching concepts and lifelong learning awareness, strive to improve their digital teaching capabilities and literacy, adhere to the principles of intelligence and democratization to build a harmonious new teacher-student relationship, and encourage students to learn independently and conduct cooperative inquiry, thereby better supporting students' learning and development. In addition, teachers should also establish an interdisciplinary teaching philosophy, integrate knowledge and skills from fields such as computer science, artificial intelligence, and big data analysis with the help of AIGC technology, and incorporate them into art and design teaching, so as to cultivate students' awareness and ability to carry out art and design creation using AIGC technology <sup>[10]</sup>.

## **4.2. Innovating the teaching content of art and design**

Against the backdrop of AIGC technology, the innovative design of art and design teaching content in colleges and universities is a key approach to enhancing professional teaching effectiveness and the quality of talent cultivation. Firstly, universities should attach importance to optimizing the art and design curriculum structure. For instance, they can offer different types of courses based on students' actual needs and their mastery and application of AIGC technology, such as adding courses on "Design and Artificial Intelligence Application" and "Interdisciplinary Practical Operation." These courses can be further developed, supplemented, and improved based on AIGC technology platforms, thereby further optimizing the art and design curriculum structure. Secondly, universities need to adjust the proportion of art and design course content. In addition to basic theoretical teaching with fixed formats, they should increase the proportion of practical teaching and AI operation training. Meanwhile, regular international academic exchanges should be organized for students to broaden their knowledge and horizons. Finally, colleges and universities can establish teaching resource databases using AIGC technology. Teachers are required to upload prepared electronic lesson plans, micro-lecture videos, etc., to online teaching platforms; students should also be allowed to upload their learning outcomes and art design works. This facilitates the joint construction and sharing of teaching resources, thus providing new ideas for the innovation of teaching content <sup>[11]</sup>.

## **4.3. Enriching art and design teaching methods**

With the support of AIGC technology, the teaching methods of art and design in colleges and universities can be further enriched, which helps better meet the learning needs of different students. For example, teachers can rely on project-driven teaching methods, actively cooperate with enterprises, and jointly design art and design project tasks for students. For instance, students can be asked to use AIGC technology to carry out an art design creation project of "corporate visual identity," integrating AIGC technology into the creation process to fully demonstrate their ideas and creativity, to achieve the goal of cultivating students' practical ability and artificial intelligence technology application ability <sup>[12]</sup>. In teaching practice, teachers can first divide students into scientific groups, encourage them to conduct in-depth research on corporate image and corporate brand strategy in the social market, to guide students to fully understand market demand. Then, students can use AIGC technology for creative design, plan the functions of corporate visual identity, and conduct intelligent corporate image model testing. In this process, teachers can also invite industry experts and enterprise mentors to participate in guiding students' practical operations, thereby helping students design products that are more in line with artistic aesthetics and market demand <sup>[13]</sup>. In addition, to further enhance students' learning experience, teachers can let students take on roles or use virtual reality equipment to communicate with customers. This can help students fully understand customer needs, thus making their designed works more targeted and practical.

#### 4.4. Optimizing art and design teaching evaluation

The application of AIGC technology can further strengthen the monitoring of teachers' and students' teaching behavior data, which is conducive to improving the accuracy and scientificity of teaching evaluation <sup>[14]</sup>. In college art and design teaching, teachers can use AIGC technology platforms and related digital auxiliary teaching tools to timely understand students' classroom participation, learning progress, practical situation, practical results, etc., and conduct in-depth analysis of students' relevant behavior data, thus better ensuring the effectiveness of students' process evaluation. In this process, teachers can also ask students to upload their designed artworks to public online platforms and invite subjects such as industry experts or front-line designers in the field of art and design to participate in the evaluation, thereby improving the comprehensiveness of teaching evaluation.

In addition, it is worth noting that teaching evaluation includes not only the evaluation of students but also the evaluation of teachers. Therefore, under the background of AIGC technology, the teaching reform of art and design majors in colleges and universities should also pay attention to this point. In practice, colleges and universities can evaluate the organization of teachers' teaching process. For example, AIGC technology platforms can be used to automatically collect data and information on teachers' teaching activities, such as the number of high-quality teaching resources released, the coverage of classroom teaching content, the application of teaching evaluation methods, and the frequency of interaction with students, to increase teachers' attention to teaching with AIGC technology <sup>[15]</sup>.

### 5. Conclusion

In conclusion, with the continuous development and progress of modern science and technology, the rise and application of generative artificial intelligence (AIGC) are gradually penetrating every corner of the art and design field, which undoubtedly brings new directions and ideas for the reform and development of art and design education in colleges and universities. Under the background of AIGC technology, the reform of college art and design education can be realized through various measures such as updating art and design teaching concepts, innovating art and design teaching content, enriching art and design teaching methods, and optimizing art and design teaching evaluation, to cultivate students into compound talents who not only have a solid professional foundation in art and design but also are proficient in AIGC technology application.

### Disclosure statement

The authors declare no conflict of interest.

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# Study on Strategies for Improving the Work Efficiency of Academic Administrators in Secondary Colleges of Universities under the Background of Informatization

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**Abstract:** In recent years, China's science and technology have been developing rapidly, and network technology has also been continuously optimized. Against this backdrop, the academic administration work of secondary colleges in universities has ushered in more opportunities, but also challenges. The development of information technology plays an important role in the work of academic administrators in secondary colleges, enabling them to change their thinking modes and strive to innovate academic administration work. Currently, however, academic administrators have not yet fully adapted to the informatization background, and some problems still need to be solved. This paper first analyzes the significance of improving the work efficiency of academic administrators in secondary colleges of universities under the background of informatization, then summarizes the existing problems, and finally puts forward specific strategies for improving their work efficiency under this background, for reference.

**Keywords:** Informatization; Universities; Secondary colleges; Academic administrators

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## 1. Introduction

In the process of carrying out educational administration work in secondary colleges of universities, the work attitude and competence of educational administrators have a significant impact on the quality of educational administration work. Currently, the number of educational administrators in secondary colleges is limited—usually, each secondary college has only two educational administrators, who also have to take on other college-related roles, such as party branch secretary and trade union committee member. These additional responsibilities affect the time arrangement of educational administrators and put certain pressure on their work. Although the work of educational administrators seems less demanding, against the backdrop of the general trend of informatization reform, they need to master necessary informatization operation skills on top of their traditional



basic skills; otherwise, it will be difficult for them to adapt to the development of informatization. Observing the work content of educational administrators reveals that their salaries are generally low, and their personal workload is difficult to quantify and evaluate. The negative impacts arising from these issues lead to inefficiency in their work or even stagnation. This paper takes this as a starting point to explore the work of educational administrators in secondary colleges of universities, aiming to find effective ways to improve their work efficiency based on a clear understanding of the current situation.

## **2. Significance of improving the work efficiency of educational administrators in secondary colleges under the background**

### **2.1. Promote the integration of educational resources and facilitate efficient utilization of resources**

Compared with other schools, universities have relatively abundant educational administration resources. Teachers can use new technical means to collect and organize data in real time, generate real-time data, and thereby achieve visual management of resources. For example, registering and managing experimental equipment in a digital form allows teachers to clearly understand the situation of each laboratory and the status of equipment, so that they can borrow equipment on time according to teaching and research needs, further improving the utilization rate of laboratories. Additionally, by collecting teachers' information and data through data aggregation, teaching tasks can be arranged scientifically, teachers' strengths can be maximized, and the waste of human resources can be reduced <sup>[1,2]</sup>. At the same time, efficient educational administration services also promote interdisciplinary and inter-professional resource sharing, eliminate information silos across disciplines and majors, and build a complementary resource environment, enabling limited educational resources to exert maximum effectiveness <sup>[3]</sup>.

### **2.2. Assist universities in digital transformation and enhance their core competitiveness**

With the rapid development of information technology, informatization construction has become an inevitable trend in the development of higher education, and improving the professional competence of educational administrators has also become an important part of the informatization development of universities. On the one hand, carrying out informatized educational administration work can provide universities with useful information, such as teaching process information, students' academic performance, and teachers' teaching evaluation, which serves as an effective basis for formulating teaching plans, adjusting talent training programs, and standardizing discipline development strategy research <sup>[4]</sup>. On the other hand, efficient educational administration services in an informatized environment can provide a good experience for teachers and students. For instance, students can obtain course information, exam information, and grade information in real time through network terminals; teachers can submit course-related information and teaching project applications via network terminals, simplifying tedious paper-based workflows. High-quality educational administration services not only help improve the image and social status of universities but also attract more excellent teachers, enabling universities to enhance their competitiveness <sup>[5]</sup>.

### **3. The current work situation of academic administrators in secondary colleges of universities in the background of informatization**

#### **3.1. Shortcomings in the application of informatization technology, and insufficient system functions and compatibility**

Although digital platforms for educational management systems are widely used in universities, there are still many technical problems in their application. The software functions of educational management information systems in some universities are relatively simple and fail to meet the actual needs of management work in secondary colleges <sup>[6,7]</sup>. For example, when teachers arrange courses, it is difficult to solve problems such as teachers having to teach across multiple campuses and some courses requiring specific classrooms. As a result, the course schedule has to be manually adjusted multiple times before it is finalized, which causes a great waste of resources and time. In terms of student performance management, some systems lack corresponding intelligent analysis tools and cannot independently generate score trends and subject comparison data, which is not conducive to analyzing teaching effects. In addition, the compatibility of information systems among various departments is still immature, and there are “information silos.” For instance, the teaching management system, scientific research system, and student work system are independent of each other, and system data cannot be interconnected and shared. When teachers need to handle cross-departmental affairs due to students’ transfer, rewards and punishments, etc., they have to constantly switch between systems and input information one by one, which increases the burden on teachers and is more likely to cause data heterogeneity. Furthermore, some outdated systems have poor stability. Once the number of logged-in users surges, the system may freeze or crash, seriously affecting the user experience of teachers and students and the development of educational management work <sup>[8]</sup>.

#### **3.2. Deep-rooted traditional work models and low efficiency in process optimization and collaboration**

For a long time, the academic administration work of secondary colleges in universities has formed a relatively fixed work model through long-term development, which makes it difficult to get rid of the previous fixed thinking mode in the process of digital transformation. Many academic administrators are still accustomed to traditional work methods such as manual data entry and paper-based signatures, and are either not interested in digital work processes or unable to adapt to the current environment. For example, when archiving course resources, academic administrators still prefer to sort out paper files rather than adopt electronic archiving methods. This leads to large storage space requirements, difficult querying, and potential risks of resource loss or damage. Another example is that in teaching work inspections, the methods of random sampling and manual recording are still almost exclusively used, without utilizing real-time information monitoring and automatic alarms, making it impossible to quickly identify problems. The collaboration within secondary colleges and with other departments in the university is ineffective. Although informatization means providing a platform for online communication and collaboration between teachers and students, due to the lack of clear work processes and task division, problems such as buck-passing and information delays occur when completing cross-departmental tasks. For example, when academic administrators are in charge of textbook ordering, they need to communicate with multiple departments. However, due to the lack of information sharing in various links and loopholes in the management mechanism, problems such as delays in textbook procurement and unclear account reconciliation may occur, disrupting teaching order <sup>[9]</sup>.

### **3.3. Urgent need to improve the comprehensive ability of academic administrators, and imperfect training and incentive mechanisms**

Against the background of informatization, modern teaching has higher requirements for the comprehensive quality of academic administrators. However, currently, academic administrators in secondary colleges of universities usually lack computer technology capabilities. Among them, those engaged in educational work are not proficient in the use of office software and academic management systems, and thus cannot give full play to the role of informatization tools <sup>[10]</sup>. For example, some academic administrators cannot flexibly use functions such as Excel formulas and pivot tables to conduct statistical analysis of data, thereby affecting the effectiveness of data processing; when using the academic management system to carry out some tedious work, operational errors often cause system crashes or data errors. In addition, the training and incentive mechanisms for university academic administrators need to be improved, which will weaken their work enthusiasm. The training of informatization skills lacks systematicness and targeting, and the content learned is limited to the basic level, making it difficult to solve specific problems encountered in teaching assistant work <sup>[11]</sup>. From the perspective of performance evaluation and career promotion, the work achievements of academic administrators lack scientific and fair evaluation, promotion is difficult, and there is a lack of effective incentive mechanisms. As a result, some academic administrators have low enthusiasm and lack innovation, leading to a decline in the quality of academic administration work.

## **4. Information technology context: strategies for enhancing work efficiency of academic administrators in secondary colleges of universities**

### **4.1. Upgrade information systems and break down data silos**

To address the inadequacies in the application of information technology in academic affairs management, universities should increase investment and update their academic administration practices, leveraging information technology tools to resolve data-related challenges. First, regarding the optimization of system functions, for the issue of course scheduling, artificial intelligence algorithms should be applied to develop an intelligent course scheduling module to improve scheduling efficiency. This module can integrate information such as teachers' teaching preferences, cross-campus distances, and practical venue requirements, then use algorithms to generate scheduling plans, which are then submitted to academic affairs staff for adjustment and optimization based on actual circumstances. This minimizes the negative impact of manual intervention <sup>[12]</sup>. For grade management, universities can develop intelligent analysis systems that automatically generate statistical trend charts of student exams, information reports on score comparisons of subjects across classes, etc., which help improve the quality of teaching evaluation.

Second, eliminate the "information silo" phenomenon and realize data sharing between various systems. Universities can integrate academic affairs, scientific research, student management and other systems by building a data center, where data information is stored uniformly and shared. For example, when there is a change in a student's academic status, after the academic affairs staff operates on the system, the subsequent information is immediately synchronized to the relevant systems, eliminating the trouble of repeated entry and avoiding data inaccuracies.

### **4.2. Reconstruct work processes and strengthen collaborative cooperation**

The integration of information technology has broken through the traditional academic affairs management



system, which requires colleges and universities to optimize, restructure, and comprehensively sort out their academic affairs processes. This paper suggests that this can be achieved through the following two aspects. First, transform business processes promptly by shifting paper-based and offline businesses to digital and online modes <sup>[13]</sup>. For instance, when archiving materials, establish unified electronic archiving standards, fix file naming rules and storage addresses, and develop electronic archive management tools to enable academic administrators to search for teaching materials online. Meanwhile, academic administrators can also use OCR scanners to directly convert the content of paper documents into electronic documents, improving archiving efficiency and information security. In the teaching review work of colleges and universities, schools can also develop a teaching quality monitoring platform to collect and analyze teaching data in real time online, and set up an automatic early warning mechanism to immediately notify relevant staff to solve problems if any are detected.

Second, clarify departmental responsibilities and further optimize inter-departmental collaboration processes. Compile inter-departmental collaboration guidelines and define work processes and responsibilities for tasks such as textbook procurement and student enrollment management. For example, when subscribing to textbooks, schools can build an online cooperation platform where different departments submit textbook requirements to the school. After being reviewed by academic administrators, the quantity and related requirements are sent to textbook suppliers via the platform. After suppliers quote prices, academic administrators and the finance department are responsible for coordinating the procurement, ensuring the timeliness and efficiency of information transmission.

#### **4.3. Strengthen personnel training and improve comprehensive competence**

Higher education institutions need to formulate and improve training systems based on their actual situations to address the insufficient informatization capabilities of academic administrators. The specific measures are as follows: First, carry out hierarchical and classified education. Given the varying levels of informatization proficiency among academic administrators, training content should focus on basic operations and introductory training for those with relatively weak informatization foundations, while advanced training can be provided for those with certain foundations to consolidate their informatization operation skills. This approach, which emphasizes the practicality and utility of training, is exploratory in terms of training methods. Second, combine multiple training methods. Current training methods include traditional face-to-face teaching and the use of online teaching systems to release teaching videos, practical demonstrations, etc. Schools can choose a combination of online and offline methods based on actual circumstances to provide convenience for academic administrators. Establish a mentor system where teachers with rich experience and high-level IT skills are selected as mentors for recruits to provide targeted guidance in daily work. Schools can also conduct regular assessments of training effectiveness and integrate the results with personal salaries to stimulate academic administrators' enthusiasm for active participation in training and achieve the goal of improving their skills <sup>[14]</sup>.

#### **4.4. Improve the assessment and incentive mechanism to stimulate work motivation**

A sound incentive and evaluation mechanism is a key means to improve the work efficiency of academic administration personnel. The assessment and incentive mechanism mainly unfolds from two aspects: First, in terms of performance assessment. A diversified evaluation standard should be established in performance appraisal, with the completion degree and quality of work as the basis for assessment. However, the level of information technology innovation and application capabilities, and cross-departmental collaboration should not be ignored. For example, personnel should be encouraged to put forward suggestions for improving information

technology-based work processes, and those whose suggestions are adopted can be commended<sup>[15]</sup>. Academic administration personnel should be assessed quarterly or semi-annually to identify their strengths and weaknesses and propose targeted improvement measures.

Second, in terms of the incentive mechanism. Special reward funds should be set up to reward academic administrators who perform well and work efficiently. The development channels for their career promotion should be expanded to provide them with more promotion opportunities. Academic administrators should also be encouraged to undertake research projects related to educational management, and the research results of these projects should be taken as an important basis for teacher professional title evaluation. This will realize a comprehensive and effective evaluation system and promote the subjective initiative and creativity of academic administration personnel.

## 5. Conclusion

In summary, academic administrative work plays a crucial role in university teaching, and the professional competence of academic administrators has the most direct impact on teaching activities. Secondary colleges (or schools within universities) need to build a high-caliber team of academic administrators to enhance the level of teaching management. For their part, academic administrators should carefully analyze the current situation of education and teaching, strengthen their awareness of innovation, provide quality services for university teaching, and ensure the smooth implementation of teaching work. After analyzing the significance of improving the work efficiency of academic administrators in university secondary colleges against the backdrop of informatization, this paper identifies three key issues: shortcomings in the application of information technology, deep-rooted traditional work models, and the urgent need to enhance the comprehensive capabilities of academic administrators. Corresponding suggestions are put forward to address these issues and improve work efficiency, including: upgrading information systems to break down data silos; reconstructing work processes to strengthen collaborative cooperation; enhancing personnel training to improve comprehensive capabilities; and improving the assessment and incentive mechanism to stimulate work motivation.

## Disclosure statement

The author declares no conflict of interest.

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# Study on the Employment-Oriented Education System and Training Model of Local Undergraduate Universities

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**Abstract:** With the proposal of the “Co-creation Initiative” for employment-oriented education, innovating and constructing the employment-oriented education system and training model, as well as promoting high-quality employment and entrepreneurship for college students, have become the main tasks of university employment-oriented education work at this stage. Based on this, this paper deeply explores the significance and strategies of the employment-oriented education system and training model in local undergraduate universities, aiming to improve the quality of students’ employment and serve local economic development.

**Keywords:** Local undergraduate universities; Employment-oriented education; Training model

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## 1. Introduction

The Notice of the Ministry of Human Resources and Social Security, the Ministry of Education, and the Ministry of Finance on Doing a Good Job in the Employment of College Graduates and Other Young People in 2025 clearly states that it is necessary to expand the main channels for enterprise employment, comprehensively use various policies such as post expansion subsidies and social security subsidies for people with employment difficulties, to encourage enterprises to recruit college graduates and other young people. It also requires disclosing the handling procedures of local policies to promote youth employment, clarifying the time limit for handling, vigorously promoting service methods such as “direct subsidy and quick handling” and “policy calculator”, promoting the centralized implementation of various employment policies, and improving the policy implementation rate. Educators should make good use of local entrepreneurship incubation carriers and encourage government-invested incubators to relax the threshold for free admission of key groups, such as college graduates. We will strengthen entrepreneurial service guarantees, include college graduates’ entrepreneurial projects in the key incubation project database, and provide “one-stop” services such as entrepreneurship training, entrepreneurial guidance, entrepreneurship incubation, and policy implementation to

improve the success rate of entrepreneurship. Support the construction of a national college student innovation and entrepreneurship achievement transformation center to promote the incubation and implementation of innovation and entrepreneurship projects <sup>[1]</sup>. Universities should follow the path in line with national development based on national policy documents, to better cultivate talents.

## **2. Significance of the employment-oriented education system and training model in local undergraduate universities**

### **2.1. Facilitating students' personal development**

The employment-oriented education system and training model in local undergraduate universities are of profound significance to students' personal growth and career development. Under the employment-oriented education system, students can receive comprehensive and systematic career guidance. From career planning courses in the early stage of enrollment, which help students understand their own interests, strengths, and career orientations, to pre-graduation employment skills training and interview simulations, every link fully prepares students for a smooth entry into the workplace <sup>[2]</sup>. For example, through career planning courses, students can clarify their future career directions—whether to engage in technological research and development, management work, or entrepreneurship—and thereby improve their professional skills and comprehensive quality in a targeted manner. The training model emphasizes the cultivation of practical abilities and innovative spirit, enabling students to have stronger employability <sup>[3]</sup>.

### **2.2. Serving local economic development**

The employment-oriented education system and training model in local undergraduate universities play an important supporting role in local economic development. Universities adjust their specialty settings and talent training programs according to the needs of local industrial development, providing a large number of professional talents that meet industrial requirements for the local area <sup>[4]</sup>. When new artificial intelligence-related industries emerge locally, universities add course modules such as basic artificial intelligence and machine learning to relevant majors. The trained students can directly work in these industries, filling the gap in industrial talent and promoting industrial upgrading and innovative development. By carrying out industry-university-research cooperation with local enterprises, universities not only provide practical platforms for students but also strengthen the connection between schools and enterprises, promote the transformation and application of scientific research achievements locally, inject new vitality into local economic development, and form a sound pattern where university talent training and local economic development mutually promote and thrive together <sup>[5]</sup>.

## **3. Strategies for the employment-oriented education system and talent cultivation model in local undergraduate universities**

### **3.1. Targeted teaching**

Colleges and universities should establish a “Career Rainbow Chart” (**Figure 1**) based on their own educational philosophy, so as to better solve the problems students encounter in employment and promote their all-around development <sup>[6]</sup>. For freshmen, colleges and universities can help them understand the career fields corresponding to their majors, as well as the development prospects and current situation of the industry, by offering professional introduction courses and organizing career planning lectures. This enables students to initially determine their



career development direction in the process of self-exploration. For sophomores who have acquired certain theoretical knowledge, colleges and universities can enhance their practical abilities and facilitate the integration of theoretical and practical knowledge by arranging their participation in professional internships and model training. For juniors with solid professional foundations and practical skills, colleges and universities can broaden their horizons, foster their innovation capabilities, and help them better adapt to workplace scenarios by encouraging their participation in on-campus and off-campus competitions. For seniors, colleges and universities can improve their professional competitiveness by providing one-on-one interview skills training to enhance their abilities. Only in this way can colleges and universities help students complete the transition from “student to beginner, to competent professional, and finally to proficient expert”, thereby better addressing the issues of career positioning, orientation, and targeting on the path of employment<sup>[7]</sup>.

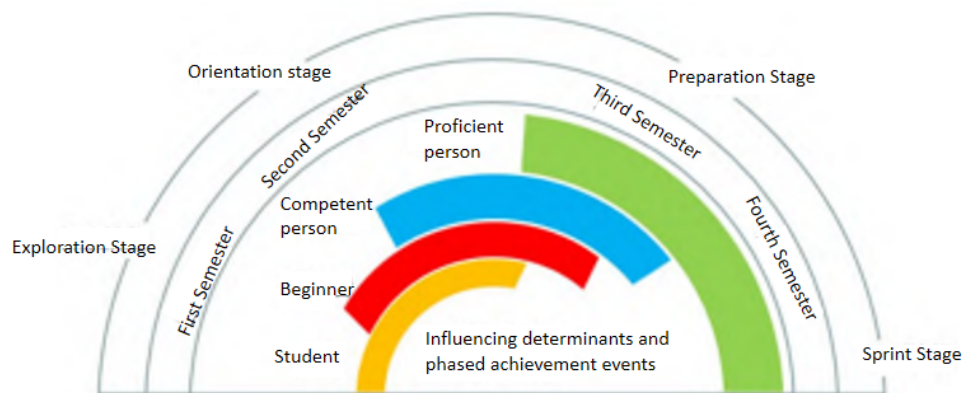


Figure 1. The career rainbow chart.

### 3.2. Internal campus circulation and external off-campus circulation

To better promote the all-round development of students' comprehensive quality, colleges and universities can carry out the initiative through the “dual-drive, dual-circulation and three-integration” employment-oriented education ecosystem, which enables more effective cultivation and education of students. Details are shown in Figure 2.

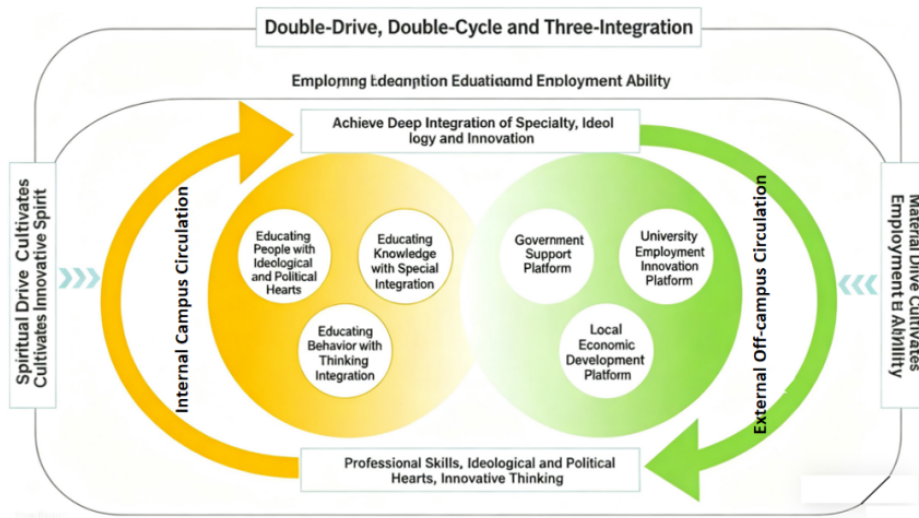


Figure 2. The “Dual-Drive, Dual-Circulation and Three-Integration.”

### **3.2.1. Ideological and political reflections on talent cultivation: Strengthening ideological guidance and consolidating employment values**

To better guide students in establishing correct employment concepts, colleges and universities can invite outstanding enterprise employees and alumni to return to campus to share how they accomplished tasks assigned by leaders step by step under the guidance of socialist core values and ultimately achieved certain accomplishments in their work. This not only sets an example for students but also helps them understand that employment and ideological and political education are inseparable. The more capable one is, the more they should establish a correct concept of career development, so that what they do is beneficial to the country and can better contribute to society <sup>[8]</sup>. For example, an enterprise employee shared a case where an employee performed exceptionally well and had outstanding abilities when first hired, but he applied the company's core technology to another company when he finally resigned, which led to certain legal issues. It is hoped that students can learn from this lesson and establish a correct view of a career <sup>[9]</sup>.

### **3.2.2. Integration of knowledge-oriented special programs: Optimizing knowledge structure and enhancing professional employability**

With the rapid development of the economy, the demand for talent in local industries has shown a diversified trend, which puts forward higher requirements for talent cultivation in undergraduate colleges and universities. In the process of curriculum design, colleges and universities can first investigate the actual needs of local industries and adjust the curriculum based on this to better cultivate talents who meet social needs. For example, in the field of artificial intelligence, colleges and universities can invite enterprise personnel to participate in curriculum design to understand the changes in enterprises, so that students can access the latest technologies and concepts, learn better in courses that meet enterprise needs, and thus promote the development of students' comprehensive quality <sup>[10]</sup>.

### **3.2.3. Integration of practice-oriented thinking: Cultivating practical abilities and shaping innovative employment thinking**

In the process of talent cultivation, colleges and universities can establish a complete teaching system from basic practice to comprehensive practice to improve students' practical abilities and comprehensive quality, so that students can better combine theoretical knowledge with practice, consolidate what they have learned, and improve their hands-on operation abilities <sup>[11]</sup>. For example, teachers will divide students who have completed theoretical knowledge in computer science into different groups. Each group chooses a project they need to complete and clarifies the role of each student. Some students may be responsible for demand analysis, some for front-end design, and others for database connection tasks. Through this method, teachers can not only enable students to better test what they have learned but also help them identify their shortcomings and make better improvements <sup>[12]</sup>.

### **3.2.4. Government support platform: leveraging policy resources to expand employment channels**

When universities learn about employment subsidies and entrepreneurship support policies introduced by the government to promote employment and entrepreneurship, they can disseminate these policies through online platforms such as campus official websites, official WeChat accounts, and bulletin boards to ensure students have access to the latest policy documents. Additionally, universities can organize teachers to discuss their

understanding of these policy documents, form a unified perspective, and then explain the policies to students, helping them better grasp the specific content, scope of application, and eligibility criteria. For example, teachers can clearly explain the application requirements, required materials, and processing procedures for each type of employment subsidy policy, enabling students to apply based on their individual needs and thereby better secure employment <sup>[13]</sup>.

### **3.2.5. University employment innovation platform: Innovating service models for precise employment guidance**

Universities can establish employment innovation platforms to provide students with precise employment guidance. These platforms can comprehensively collect and analyze multi-dimensional information about students, such as their majors, interests, and job search intentions, and match this information with detailed job-related content, including job types, skill requirements, and salary packages. This precise matching improves students' employment success rate; if matching is unsuccessful, the platform will automatically push information about relevant recruiting enterprises to the students. For instance, for computer science students who wish to work in a specific region, universities can screen and push recruitment information from eligible enterprises through the platform, allowing students to make choices based on their needs and thus improving both students' job search efficiency and the university's employment rate.

### **3.2.6. Local economic development demand platform: Connecting with local industries to serve regional development**

Universities should adjust their program offerings based on an understanding of local economic development plans and industrial layouts to better align with local needs. For example, if a region focuses on developing tourism, the tourism industry not only requires grassroots service talents such as tour guides and scenic spot managers but also high-quality talents with professional knowledge in tourism planning, marketing, and hotel management. Based on this, universities can offer related programs such as tourism management and hotel management to cultivate professional talents suitable for the development of the local tourism industry, achieving precise alignment between university talent cultivation and local industrial development <sup>[14]</sup>.

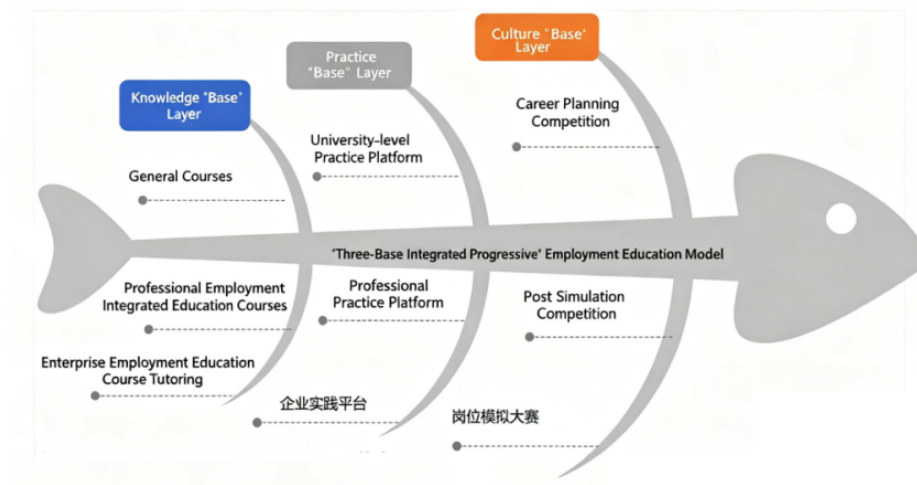
## **3.3. The “Three Foundations Integrated” progressive education system**

Colleges and universities can integrate knowledge, practice, and culture to better enhance students' core competencies, as specifically illustrated in **Figure 3**. Firstly, at the knowledge foundation level, universities can offer general education courses that all students are required to take, covering areas such as humanistic literacy, natural sciences, and information technology, thereby helping students build a solid theoretical foundation. Based on basic courses, they can also set up “major-employment integrated” education courses according to the development directions of different majors and industry trends, enabling students to integrate professional knowledge with employment-related content. Furthermore, they can develop enterprise employment-oriented courses based on enterprises' actual talent demands, namely, introducing case studies from enterprises to allow students to integrate such content with their existing knowledge and form an internalized knowledge system <sup>[15]</sup>.

Secondly, at the practice foundation level, a practice platform involving the university, enterprises, and academic disciplines can be established. Students can first select their major on the platform's login page, then study theoretical knowledge, and subsequently choose enterprise practice cases for hands-on training. This allows students to engage with major-specific practical content, thereby deepening their understanding of theoretical



knowledge and forming a complete circular system. Finally, at the cultural foundation level, universities can organize various competitions to help students gain insight into the application of different majors in diverse scenarios and clarify the skills they need to acquire. This prompts students to reflect on their shortcomings and better improve their capabilities.



**Figure 3.** The “Three Foundations Integrated” progressive employment education model.

## 4. Conclusion

Against the backdrop of the current economic situation and employment environment, optimizing the employment-oriented education system and innovating talent cultivation models should not only be the responsibility of colleges and universities, but also involve the government and enterprises. Only in this way can it better align with the development of local economies and drive industrial upgrading. In the future, colleges and universities should further deepen educational reforms to build a more scientific and efficient employment-oriented education ecosystem.

## Disclosure statement

The authors declare no conflict of interest.

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# AI + Interdisciplinary Teaching: Curriculum Design and Practical Exploration for Cultivating Innovative Talents in Middle Schools

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**Abstract:** Against the backdrop of the rapid development of artificial intelligence (AI) technology, middle school education is tasked with the important mission of cultivating innovative talents. This paper focuses on the “AI + interdisciplinary teaching” model, exploring its curriculum design and practical paths in cultivating innovative talents in middle schools. In particular, it combines areas such as language and characters, literary appreciation, and writing teaching in middle school Chinese instruction to analyze how AI technology can break down disciplinary barriers and stimulate students’ innovative thinking and comprehensive literacy. The research shows that the integration of AI and interdisciplinary teaching can provide a new paradigm for cultivating innovative talents in middle schools, but it is also necessary to address the challenges in the application of technology and its integration with teaching.

**Keywords:** AI; Interdisciplinary teaching; Middle school Chinese; Cultivation of innovative talents

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## 1. Introduction

The Opinions of the Ministry of Education and Eight Other Departments on Accelerating the Advancement of Educational Digitalization clearly states that we should thoroughly implement the spirit of the 20th National Congress of the Communist Party of China, the Second and Third Plenary Sessions of the 20th Central Committee, and the National Education Conference, and fully implement the important requirements on education. In particular, guided by the important instructions on educational digitalization, we should deeply implement the national educational digitalization strategy, adhere to an application-oriented approach and governance as the foundation, uphold connection first, content as the core, and cooperation as the key, focus on integration, intelligence, and internationalization, expand the coverage of high-quality educational resources, promote AI to facilitate educational reform, accelerate the formation of a universally accessible lifelong education system, and help build a learning society where everyone can learn, everywhere can learn, and at all times can learn, to provide strong support for effectively responding to the new round of scientific and

technological revolution and industrial transformation and accelerating the building of a powerful education country. Educators should improve knowledge graphs, construct competence graphs, deepen the application of educational large models, promote the intelligent upgrading of the curriculum system, teaching material system, and teaching system, integrate AI technology into all elements and the entire process of education and teaching, and promote the integration of science and technology education with humanities education. We will comprehensively advance the integration of AI education in primary, secondary, and tertiary schools, develop “general + characteristic” college AI general education courses, build several university smart courses, offer high-quality information technology-related courses in primary and secondary schools, and encourage the opening of AI characteristic courses. Educators will formulate guidelines for the construction and management of digital teaching materials, develop several demonstration high-quality digital teaching materials by field and major, and support local governments, schools, and enterprises in developing digital teaching materials<sup>[1]</sup>. Schools should follow the path in line with national development in accordance with national policy documents, so as to better cultivate talents.

## **2. The application status and value of AI in interdisciplinary teaching**

### **2.1. Application status**

Nowadays, the application of AI technology in teaching is not only reflected in the construction of intelligent teaching platforms, the establishment of personalized learning systems, and the use of virtual experimental tools, but also in the integration of knowledge across different disciplines. For example, in terms of interdisciplinary integration, teachers can use natural language processing technology to analyze historical and cultural information in literary works, thereby better understanding the relationship between the background and emotions in poems. This not only enables students to recognize that knowledge integration is a unified whole, but also helps them integrate knowledge from various subjects more effectively<sup>[2]</sup>.

### **2.2. Value analysis**

On the one hand, the integration of artificial intelligence technology and interdisciplinary teaching can provide students with diverse learning resources, allowing them to learn according to their own interests, thereby better stimulating their learning interest and promoting their learning initiative. On the other hand, this integration enables students to discuss controversial issues, which helps cultivate their critical thinking and problem-solving abilities<sup>[3]</sup>. For instance, in middle school Chinese teaching, teachers will use artificial intelligence technology to integrate knowledge related to the article in fields such as history, art, and information technology, enabling students to understand the emotions expressed in the article from different perspectives<sup>[4]</sup>.

## **3. Problems faced by “AI + Interdisciplinary Teaching”**

### **3.1. Difficulties in integrating technology application with teaching**

Firstly, some teachers, due to their limited receptive ability, find it difficult to effectively integrate artificial intelligence technology with disciplines, resulting in a disconnection between the two; secondly, teachers may lack an in-depth understanding of artificial intelligence technology and be unsure how to select appropriate technical tools based on the characteristics of disciplines, merely introducing them mechanically, which leads to a separation between disciplines and artificial intelligence; thirdly, some teachers, influenced by traditional

teaching concepts and methods, find it hard to accept the use of artificial intelligence technology and thus insist on using traditional teaching methods, missing the opportunity to improve teaching efficiency and quality by applying artificial intelligence technology <sup>[5]</sup>.

### **3.2. Disciplinary barriers and complexity of curriculum design**

Disciplinary barriers are like an invisible wall standing between different disciplines. Each discipline has its unique knowledge system, research methods, and discourse system. Teachers develop disciplinary thinking patterns through long-term professional learning, making it difficult for them to quickly break through disciplinary boundaries <sup>[6]</sup>. For example, science teachers may have an insufficient understanding of the humanistic connotations of liberal arts, while liberal arts teachers may feel unfamiliar with the application of artificial intelligence algorithms. This makes it challenging to integrate knowledge in interdisciplinary teaching and achieve genuine disciplinary crossover. To design courses that integrate artificial intelligence technology with multidisciplinary knowledge, teachers need to not only comprehensively consider the teaching objectives and content logic of each discipline but also assess students' cognitive levels. Only in this way can the designed content align with students' learning interests <sup>[7]</sup>.

### **3.3. Students' dependence on technology and the cultivation of independent learning ability**

With the rapid development of AI technology, it is worrying that some students have become overly dependent on it. Nowadays, regardless of the assignments given by teachers, students habitually rely on AI technology to complete them, which will reduce their independent thinking ability. Assignments are an important way for students to consolidate classroom knowledge and exercise their thinking, requiring them to apply what they have learned, conduct in-depth analysis, and solve problems independently <sup>[8]</sup>. However, the convenience of AI has led many students to abandon independent exploration and directly obtain answers, resulting in lazy and rigid thinking. In the long run, they will find it difficult to truly understand and apply classroom knowledge; knowledge will only be mechanically stored in their minds and cannot be transformed into the ability to solve problems <sup>[9]</sup>.

## **4. Strategies for curriculum design and practical exploration in cultivating innovative talents in middle schools under the background of “AI + Interdisciplinary Teaching”**

### **4.1. Strengthen teacher training to improve technical literacy and interdisciplinary teaching competence**

On campus, schools can help teachers better master the application of artificial intelligence (AI) technology and design curriculum content more effectively through AI technology and interdisciplinary teaching training. For example, schools can invite experts to provide guidance for teachers, enabling them to raise and resolve problems encountered in teaching. After experts and scholars address these issues, each teacher is required to write a corresponding study report. Additionally, regular group meetings should be organized for teachers to reflect on their shortcomings during this period, as well as propose improvement methods and strategies <sup>[10]</sup>. Off campus, schools can adopt a teacher exchange program to allow teachers to learn teaching methods and strategies from different schools and apply them to their own school's teaching. This not only enhances their own teaching



approaches but also enriches those of other teachers. For instance, schools may send outstanding teachers to key provincial and municipal schools to learn not only the teaching content there but also interdisciplinary knowledge and the application of AI, thereby comprehensively promoting teachers' professional development <sup>[11]</sup>.

## **4.2. Optimize curriculum design and establish a scientific interdisciplinary teaching system**

Teachers can develop systematic “AI + Interdisciplinary Teaching” curriculum plans based on the teaching characteristics of different subjects and the goals of cultivating innovative talents. These plans will better clarify the teaching objectives, teaching content, and evaluation standards for each subject, thereby promoting students' all-round development. The following discussion focuses on middle school Chinese.

### **4.2.1. Language and character teaching: AI empowers the interdisciplinary construction of language knowledge**

In Chinese teaching, teachers can integrate language knowledge with subjects such as history, culture, and science using AI technology, helping students better understand Chinese characters in textbooks. For example, teachers can use AI to carry out an interdisciplinary teaching unit themed “Historical Culture in Chinese Characters,” aiming to explore the connection between Chinese characters and historical culture, and cultivate students' language perception and cultural understanding abilities. Specifically, teachers can use an AI Chinese character database to demonstrate the evolution process of characters such as “鼎 (ding, tripod)” and “马 (ma, horse),” while combining knowledge of bronze culture and ancient transportation methods to help students better understand the composition of these characters <sup>[12]</sup>. Subsequently, teachers can divide students into groups and ask them to use AI technology to compare the linguistic characteristics of documents from different historical periods. Some groups may point out that pre-Qin prose is simple and unsophisticated, while others may note that Tang and Song poetry is elegant and magnificent. Through this teaching method, teachers can not only help students deepen their understanding of Chinese characters but also enable them to present their findings more effectively <sup>[13]</sup>.

### **4.2.2. Literary appreciation teaching: AI builds a multidimensional literary interpretation space**

In the process of guiding students in literary appreciation, teachers can use artificial intelligence (AI) technology as a teaching aid. For example, when teaching “Interdisciplinary Appreciation of A Dream of Red Mansions”, teachers can utilize visualization technology in AI to analyze the character relationships and the context of plot development in A Dream of Red Mansions, helping students better understand these relationships. Besides, teachers can also use VR technology to recreate the scenes of the Grand View Garden, making students feel as if they are in a real environment and thus better understand the integration of literature and fine arts. After students have gained a profound experience, teachers will ask them to analyze the emotions expressed in the text from their own perspectives, then compile all the students' analyses and check the alternative thinking directions provided by AI, so as to further deepen the students' comprehension abilities <sup>[14]</sup>.

### **4.2.3. Writing teaching: AI inspires interdisciplinary creative inspiration**

Students can explore new writing directions with the help of AI technology. For instance, teachers can organize teaching activities themed “Interdisciplinary Thematic Writing”, aiming to guide students to integrate knowledge



from different disciplines into their writing through AI. Take the topic “The Collision Between Technology and Humanity” as an example: first, students use the search function of AI to collect materials related to relevant disciplines; second, they analyze and integrate the collected materials, and AI generates a writing outline and framework; finally, students develop their writing based on the outline provided by AI, and upload the first draft to an intelligent essay correction system for revisions. Teachers then provide personalized guidance to students based on AI’s correction results, thereby better promoting students’ understanding of writing knowledge <sup>[15]</sup>.

#### **4.3. Guiding students to use AI technology appropriately and cultivating their independent learning and innovation abilities**

Although artificial intelligence technology has strong data processing and analysis capabilities, and can provide rich learning resources, personalized learning paths, and real-time learning feedback for teaching, it should essentially be regarded as a tool to assist learning rather than the core leading force in teaching, so that teachers can better carry out education. Teachers can use artificial intelligence technology to promote students’ all-around development. For example, teachers can provide students with targeted exercises and explanations through intelligent tutoring systems to help them better grasp key knowledge points; use virtual laboratories to allow students to conduct experimental inquiries in a safe and convenient environment, thereby enhancing their practical abilities. However, if teachers focus all their teaching efforts on the use of artificial intelligence technology, it will not only make teaching lose humanistic care and personalized characteristics, but also make it difficult for students to develop independent thinking abilities. To prevent students from becoming overly dependent on artificial intelligence technology, teachers can stimulate students’ curiosity and desire for knowledge by designing questions so that they can better engage in the teachers’ explanations. In this process, students can not only understand knowledge in depth, but also exercise their critical thinking and problem-solving abilities; teachers can also provide students with a diversified platform for ideological collision through cooperative communication, allowing students to not only share their own views and experiences, but also listen to others’ ideas and learn to look at problems from different perspectives.

### **5. Conclusion**

This paper conducts an in-depth exploration of the application status and value of AI in interdisciplinary teaching, the challenges faced by “AI + interdisciplinary teaching”, and the strategies for curriculum design and practical exploration in cultivating innovative talents in middle schools under the background of “AI + interdisciplinary teaching”. It aims to provide certain references for relevant researchers.

### **Disclosure statement**

The author declares no conflict of interest.

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# Exploration of Talent Training Model for Higher Education Major in Universities Based on OBE Concept

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**Abstract:** Against the backdrop of higher education reform, the traditional education model is clearly no longer suitable for the current talent training needs. The OBE (Outcome-Based Education) concept is an outcome-oriented educational philosophy. Constructing a talent training model for the higher education major based on this concept can optimize the curriculum structure, improve teaching methods, and promote the scientific and professional development of teaching in the higher education major. Based on this, this paper first briefly clarifies the OBE educational concept and its characteristics, sorts out the alignment between this concept and the talent training of the higher education major, and proposes strategies for constructing the talent training model of the higher education major, hoping to provide useful references for relevant educators.

**Keywords:** OBE concept; Higher education major; Talent training model

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## 1. Introduction

In the new era, higher education has increasingly emphasized the construction of undergraduate majors. How to promote the reform and innovation of higher education and improve the quality of talent training has become the focus of attention from all sectors of society. The “Opinions on Deepening the Reform of Undergraduate Education and Teaching to Comprehensively Improve the Quality of Talent Training” issued in 2019 pointed out that it is necessary to comprehensively improve the quality of undergraduate education and teaching and strengthen the function of cultivating talents through scientific research. Similarly, “China’s Education Modernization 2035” proposes to pay attention to prominent issues in education development to promote the high-level and high-quality popularization of education at all levels and types. Against this background, various universities have paid more attention to the construction of undergraduate majors and the reform of talent training, aiming to comprehensively improve the quality of talent training and cultivate high-quality talents who meet the needs of the education industry.

The higher education major is a core major in normal undergraduate education, shouldering the important mission of providing high-quality teachers for primary and secondary schools and promoting the development of education disciplines. The OBE concept centers on students, is oriented by outcomes, and focuses on improving students' practical abilities as well as cultivating their knowledge and literacy. This concept provides a new perspective for universities to cultivate application-oriented talents. Therefore, adhering to the OBE concept and exploring the talent training model for the higher education major in universities is of great significance for the all-round development of students and the improvement of the quality of talents in the higher education major.

## **2. OBE educational philosophy and its characteristics**

### **2.1. Philosophy**

The OBE (Outcomes-based Education) educational philosophy was proposed in 1981, and since then, it has attracted continuous attention and exploration from a large number of experts and scholars. This philosophy has been widely applied worldwide and has gradually formed a comprehensive theoretical system. In the field of higher education and talent cultivation in some developed countries, the OBE educational philosophy has become a mainstream educational concept<sup>[1]</sup>.

As an advanced educational philosophy, the core connotation of OBE can be summarized in five aspects:

- (1) It upholds the concept of “success for all”. The OBE philosophy holds that every student has the potential to succeed, and teachers need to provide students with personalized learning opportunities to help them achieve their learning goals and ensure that all students can achieve success in their studies.
- (2) It implements personalized assessment and respects individual differences among students. The OBE philosophy emphasizes that each student is an independent individual, and teachers should formulate exclusive assessment standards and methods based on students' different learning progress and ability development.
- (3) It focuses on learning proficiency. Teaching evaluation should be based on students' mastery of the learned content, and teachers need to ensure that students fully understand and grasp the knowledge and skills.
- (4) It clarifies performance responsibilities. Under the OBE philosophy, schools and students jointly assume the responsibility for learning outcomes: schools are responsible for providing high-quality teaching resources and environments, while students need to actively participate in learning and pursue learning achievements.
- (5) It adheres to competence-based education. The OBE philosophy holds that education should be oriented towards cultivating students' ability to adapt to future life. In the cultivation of talents in the education major, it is necessary to clearly list the core competencies that students should possess, formulate requirements for each competence, and match corresponding courses, to ensure that what students learn is closely related to industry needs and social development.

### **2.2. Characteristics**

The OBE (Outcome-Based Education) philosophy of education possesses the following characteristics:

- (1) It is student-centered. The OBE philosophy emphasizes highlighting the student's dominant role, and teachers should design teaching sessions based on understanding students' needs and interests<sup>[2]</sup>.
- (2) It is outcome-oriented. The OBE philosophy aims to promote the all-round development of students in terms

of knowledge, literacy, and skills by designing appropriate teaching content and objectives. Teachers need to take the cultivation of students' learning outcomes and practical application abilities as the core teaching goals, and design teaching activities and evaluation methods around these goals. By setting specific learning objectives, constructing a teaching process that matches them, and establishing a corresponding evaluation system, the achievements and performance of students can be objectively measured<sup>[3]</sup>. Based on evaluation feedback, teachers should promptly adjust teaching strategies, optimize teaching methods and content, and ensure that students can truly achieve the expected learning outcomes.

- (3) It takes sustainable development as its purpose. The OBE philosophy emphasizes not only students' current academic performance but also values their long-term development. Therefore, teachers need to consider how to cultivate students' innovative abilities, critical thinking, and collaborative abilities, to lay the groundwork for students' long-term development and promote their all-around development.

### **3. The alignment between the OBE educational philosophy and the talent development of the pedagogy major**

#### **3.1. At the level of training objectives**

The pedagogy major aims to cultivate high-quality talents who possess advanced educational concepts, good professional ethics, and strong educational theoretical literacy, and who are competent in educational teaching, educational management, educational research, and other work. This is to meet the development needs of the education sector and serve society<sup>[4]</sup>. However, the traditional training objectives of the pedagogy major are vague, and there is a disconnect between these objectives and the needs of primary and secondary school teachers. The OBE (Outcome-Based Education) philosophy, which is outcome-oriented and emphasizes meaningful learning, is highly aligned with the core demand of the pedagogy major for cultivating talents that meet industry needs. By clarifying learning outcomes, the pedagogy major can formulate more detailed and precise talent training objectives to meet students' learning needs and society's expectations for graduates of the pedagogy major<sup>[5]</sup>.

#### **3.2. At the level of the curriculum system**

The curriculum system for talent development in the pedagogy major usually consists of three modules: general education, professional education, and personalized education. It aims to cultivate students' basic theoretical literacy, teaching skills, teaching research capabilities, and teaching innovation capabilities<sup>[6]</sup>. The OBE educational philosophy extends its focus beyond the classroom and emphasizes establishing a close connection between curriculum content and real-life needs. This philosophy requires educators to clearly plan the expected learning outcomes of students at the beginning of teaching design, and then design courses, organize teaching, and implement evaluations around this goal. The curriculum system of the pedagogy major needs to address issues such as the positioning of teaching objectives and teaching optimization strategies, and the OBE educational philosophy can provide solutions to these issues. There is an inherent correlation and complementarity between the two, which can promote the development of the curriculum system in a more comprehensive and efficient direction<sup>[7]</sup>.

#### **3.3. At the level of evaluation system**

The talent development evaluation system of the pedagogy major aims to ensure that the quality of



talent development is consistent with the expected objectives. The OBE philosophy aims to ensure the comprehensiveness of the evaluation perspective by establishing an evaluation mechanism involving multiple stakeholders such as employers, schools, and parents. Under the guidance of this philosophy, universities can track the entire process, record students' learning trajectories from enrollment to graduation, conduct precise evaluations based on different course objectives and graduation requirements, and control the quality of talent output. Additionally, it regularly examines the implementation of course exercises and course objectives, and quantifies the contribution of courses to graduation indicator points<sup>[8]</sup>. Integrating the OBE philosophy into the pedagogy major can enhance the authority and objectivity of evaluation results and promote the connection between the talent development of the pedagogy major and social needs<sup>[9]</sup>.

## **4. Construction strategies for the talent training model of the pedagogy major based on the OBE concept**

### **4.1. Highlight reverse design and clarify talent training objectives**

One of the characteristics of the teaching model based on the OBE (Outcome-Based Education) concept is “reverse design”, which means reversely designing training objectives according to learning outcomes and focusing on the actual achievements students gain during the learning process<sup>[10]</sup>. Under the guidance of the OBE concept, the pedagogy major needs to clarify its training objectives based on market demands and the needs of employers. Specifically, first, it should align with the demands of the market and employers, and set talent training objectives and graduation requirements accordingly; second, it should conduct timely research on the labor market, grasp the changes in society's demand for pedagogy professionals, and clarify the training objectives and positioning based on discipline development<sup>[11]</sup>. To this end, the pedagogy major should form an expert team consisting of education industry experts, frontline teachers, and backbone personnel in pedagogy management to refine talent training objectives and graduation requirements, so as to scientifically evaluate the achievement of talent training goals.

### **4.2. Optimize the curriculum system and improve the quality of talent training**

The construction of the curriculum system is the carrier of talent training and the key to achieving talent training objectives. Therefore, in combination with the OBE concept, the curriculum system should be comprehensively optimized based on graduation requirements and training objectives, and a curriculum matrix composed of general education courses, professional basic courses, professional core courses, elective courses, and practical teaching should be built. In the optimization process, the following aspects should be focused on:

- (1) In terms of curriculum structure, the proportion of class hours for theoretical courses can be appropriately reduced, and the class hours for practical courses can be increased accordingly—for example, adding practical course modules such as educational internships and the application of educational technology—to guide students to apply the theoretical knowledge they have learned to real teaching scenarios<sup>[12]</sup>.
- (2) In terms of curriculum content, cutting-edge knowledge should be integrated, such as artificial intelligence, blended teaching, and the latest cases of education and curriculum reform, to ensure that the teaching content is in line with social development.
- (3) In terms of teaching methods, the pedagogy major can implement small-class teaching to increase interaction between teachers and students and create a better learning environment for students. At the same time, introduce project-based learning and problem-oriented learning, with real educational



problems as the driving force, to guide students to carry out independent inquiry and collaborative learning, thereby cultivating their innovative ability and collaborative ability<sup>[13]</sup>.

- (4) Curriculum design should break down professional barriers, build a “university-school” joint training base, promote the integration of theory and practice, as well as the integration of teaching research and teaching, and enhance the diversity and effectiveness of the curriculum.

On this basis, to support the optimized implementation of the curriculum system, it is also necessary to simultaneously build a supporting teaching resource database: select high-quality teaching materials that meet the curriculum objectives, and develop various forms of digital teaching resources such as micro-courses and teaching case databases; strengthen the construction of laboratories and practical bases—for example, building smart education laboratories and co-constructing internship bases with high-quality primary and secondary schools—to provide guarantee for talent training.

### **4.3. Establish a continuous improvement mechanism and improve the quality evaluation system**

Guided by the OBE (Outcome-Based Education) philosophy, a cyclic evaluation mechanism of “evaluation, feedback, improvement, and re-evaluation” can be established to address the drawbacks of traditional teaching models<sup>[14]</sup>.

- (1) For the education major, an evaluation framework should be built covering such dimensions as talent cultivation objectives, graduation requirements, the richness of curriculum resources, and the effectiveness of quality management and monitoring.
- (2) Innovation in evaluation methods should be oriented toward learning outcomes, and more diversified assessment tools should be adopted. Specifically, students can be organized to write research reports, or be encouraged to actively participate in in-class presentations and discussions for assessment purposes. This ensures that the evaluation runs through the entire process of students’ learning. Such an approach not only stimulates students’ innovation capabilities and enhances their practical skills but also enables teachers to track students’ growth and gain a comprehensive understanding of their development.
- (3) The university may set up a dedicated leading group responsible for overall planning and coordinating resources and efforts from various parties. Specifically, the leading group should systematically formulate a development plan for the education major, clarify specific tasks for each phase, implement a target responsibility system, and assign responsibilities to individual staff members.

### **4.4. Jointly promote the dual-mentor system throughout the cultivation process and strengthen the building of the teaching staff**

The dual-mentor system can effectively integrate on-campus and off-campus educational resources, enabling students to achieve all-around development under the guidance of both on-campus and off-campus mentors. Typically, the primary mentor is an on-campus teacher, while the collaborative mentor is an interdisciplinary professional, an off-campus expert, or a practitioner from relevant industries. The advantages of this system lie in improving the quality of student cultivation, promoting cooperation between teaching and research teams, advancing university-enterprise collaboration, and fostering talents that meet the needs of industries<sup>[15]</sup>. To give full play to the advantages of the dual-mentor system, mentors from both sides need to cooperate closely: they should jointly formulate talent cultivation plans, scientifically design the theoretical curriculum system, link theoretical courses with practical courses, and align the curriculum with the needs of educational positions in

schools. Throughout the cultivation process, the two parties must maintain communication, regularly exchange information on students' learning progress and performance, and provide solutions to problems arising during this process. In addition, to improve the professional competence and teaching ability of teachers in the education major and strengthen the teaching team, the university needs to enhance the training of on-campus teachers through special training programs, academic seminars, and other initiatives. At the same time, it should strengthen the introduction of outstanding talents, give full play to the main role of employers, improve the scientificity and targeting of talent introduction, and enrich the existing teaching staff.

## 5. Conclusion

To sum up, the OBE (Outcome-Based Education) concept has currently attracted the attention of a large number of educators and has become a scientific direction for pursuing excellence in education and teaching. Against the backdrop of educational reform, guiding the teaching reform of the pedagogy major with the OBE concept can highlight the dominant position of students, attach importance to their personalized development, and provide them with appropriate learning opportunities. This enables every student to gain knowledge and grow, thereby cultivating more high-quality educational talents.

## Disclosure statement

The author declares no conflict of interest.

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# Analysis of Application Strategies for College Students' Mental Health Education from the Perspective of New Media

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**Abstract:** With the rapid development of new media technology, its application value in the field of education models can hardly meet the diverse needs of contemporary college students. How to give full play to the advantages of new college students' mental health education has become increasingly prominent. Facing the new situation and tasks of mental health education in the new media era, traditional mental health media and innovating the content and forms of mental health education have become a major and urgent issue for educators. Based on this, this paper studies the application of college students' mental health education from the perspective of new media, expounds the positive empowering role of college students' mental health education in the new media era, and proposes targeted application strategies, aiming to provide theoretical reference and practical guidance for optimizing the mental health education model for college students in the new media era.

**Keywords:** New media; College students; Mental health education; Application strategies

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## 1. Introduction

Nowadays, with the rapid development of new media, its characteristics of real-time interaction, interactivity, and diversity have profoundly changed the way college students live and study. As the main user group of new media, college students' mental health status has become more closely linked to their exposure to new media. Therefore, exploring effective methods to scientifically and efficiently leverage the "therapeutic" effect of new media on college students' mental health not only meets the requirements of the times but also constitutes an indispensable link in safeguarding college students' physical and mental health and cultivating talents <sup>[1]</sup>. This study holds significant social implications for strengthening the in-depth integration of psychological education and new media technology, as well as enhancing the effectiveness of education and teaching.

## **2. The positive empowerment of college students' mental health education from the perspective of new media**

### **2.1. It is conducive to expanding college students' social networks**

Based on the social support theory, good social connections can provide individuals with help from multiple perspectives, such as the spiritual and material levels, which has a positive impact on their mental health. The social circles of college students who use new network tools are not restricted by regions and cultures, and they can find people from all over the world on social media or interest-based groups<sup>[2]</sup>. For example, students can use tools like Weibo and Douyin to establish online communities based on their hobbies, share their daily experiences and exchange learning insights. In the process of interacting with each other, they can feel a sense of identity and acceptance, expand their social circles, improve their social skills, and build a strong social support system for their mental health<sup>[3]</sup>.

### **2.2. It is conducive to promoting college students' mental health**

The use of new media enables college students to actively express their emotions and pour out their hearts. According to the emotional catharsis theory, reasonable expression can relieve psychological tension. By sharing troubles through channels such as anonymous social software or message boards, students can avoid the psychological pressure brought by real-world interpersonal interactions and quickly alleviate negative emotions<sup>[4]</sup>. At the same time, through new media resources such as popular science videos on psychological knowledge and mindfulness meditation video tutorials, students can learn methods to deal with psychological problems, improve their psychological resilience, and achieve the goals of self-maintenance and enhanced mental health.

### **2.3. It is conducive to enriching mental health education resources**

With the help of new media technology, various elements such as texts, pictures, and videos are integrated, which greatly expands the scope of teaching and deepens the depth of teaching. Psychology micro-classes collect high-quality courses offered by senior psychologists from all over the world, allowing students to freely learn the basic principles of psychology; in psychology short videos, professional counselors introduce common psychological problems and solutions in simple and vivid ways, visualizing complex psychological knowledge points. This also encourages students to participate in the production and dissemination of content, forming a User-Generated Content (UGC) model, which enriches the diversity of mental health teaching resources and better meets students' personalized learning needs<sup>[5]</sup>.

## **3. Application strategies for college students' mental health education from the perspective of new media**

### **3.1. Integrate new media educational resources to enrich students' learning experience**

From the perspective of new media, higher vocational colleges should focus on building a scientific and diversified mental health education resource system, integrating new media educational resources oriented by students' needs, constructing a "pyramid-shaped" resource structure, and following the "scenario-based" development principle to comprehensively enrich students' learning experience. This resource structure is designed for students at different growth stages and can meet the learning needs of different students. The bottom layer is the compulsory knowledge section, which includes content such as psychological concepts and analysis of common psychological troubles. The basic knowledge of the course is presented in the form



of interesting videos, and obscure concepts are explained in simple and popular language, enabling students to master knowledge more easily and thus fully arousing their learning enthusiasm <sup>[6]</sup>. The middle layer is the knowledge and skills section, which covers content like “how to regulate emotions by oneself” and “how to release pressure”. It is presented through micro-videos and online classroom videos, with more in-depth content, emphasizing the training of students’ practical skills in dealing with psychological problems. The top layer is the personalized knowledge section, targeting students with a strong interest in psychological knowledge, allowing them to choose different content according to their own needs. For example, students in need of job-seeking psychological counseling can obtain career-related knowledge and special consultations, while those troubled by romantic emotions can receive online Q&A and resource access, thereby effectively regulating their emotional problems and ensuring the accurate delivery of psychological services <sup>[7]</sup>.

In line with this resource structure, teachers should focus on integrating relevant resources and make full use of the advantage of integrating resources related to common situations around students to help them adjust to psychological problems. For instance, regarding the university dormitory scenario, teachers can integrate teaching resources on psychological adaptation in interpersonal relationships and design relevant teaching content to help students correctly handle interpersonal relationships. In response to students’ anxiety before final exams, teachers can integrate resources related to students’ test anxiety and record video lectures on “Practical Methods to Relieve Pre-Exam Anxiety” to help students alleviate pre-exam pressure. For the employment anxiety of many college students before graduation, teachers can integrate resources on job hunting and career planning and produce teaching videos on “Psychological Issues Needing Attention in College Students’ Career Planning” to help students clarify their future development paths <sup>[8]</sup>. Under such reforms, mental health education is no longer an empty theoretical explanation, but has become an accessible and operable life experience, which attracts students, greatly enhances the pertinence of teaching resources, and effectively improves students’ cognitive level of mental health.

### **3.2. Organizing diversified educational activities to promote students’ healthy development**

To effectively improve teaching outcomes, teachers should focus on organizing a variety of teaching activities, using interesting activities to attract students, enabling them to gain positive energy through participation and achieve healthy development. The first type is online competition activities. These activities are mainly carried out on new media platforms, featuring strong convenience and interactivity, which can arouse students’ interest in participation and help them accumulate psychological knowledge in the process. Teachers use video open course websites to share short videos on psychological popularization, explaining psychological principles through vivid and interesting animations, feature films and other forms, breaking the boring traditional teaching model <sup>[9]</sup>. In apps, sections such as psychological assessment, online consultation and anonymous communication are designed to facilitate students to obtain psychological counseling services through mobile devices. Online psychological theme discussions and check-in contests are held via WeChat and Weibo, such as the “21-day good habit cultivation” activity, to guide students to share their daily emotions, answer questions for each other, and create a positive online psychological atmosphere.

The second type is immersive experience activities. Through forms such as psychological sitcom performances, psychological group counseling and outdoor development activities, teachers help students relax in role-playing and role interaction scenarios and improve their mental health capabilities. For example, the “Wisdom Theater” is held to encourage students to create their own works and perform reproductions of moods encountered in school life on stage, deepening their understanding of psychological troubles and enhancing their



empathy and self-awareness in the process. In addition, regular mental health lectures are held, where experts and outstanding seniors and sisters share popular online cases to teach about troubles such as love and interpersonal communication, enhancing the interest and effectiveness of teaching content <sup>[10]</sup>.

The third type is online-offline hybrid activities. Teachers integrate digital and traditional teaching resources to plan and implement periodic theme education activities, such as the “Spiritual Growth Theme Month”, which organically combines special reports and interactive experiences in physical classrooms with real-time communication and topic discussions on online platforms, creating a multi-dimensional education system. They guide students to form psychological mutual aid groups and carry out peer support projects through social media, including compiling mental health electronic journals and managing campus psychological self-media accounts, to fully mobilize students’ enthusiasm and enhance the interactivity and sense of belonging of educational practices. Through various forms of educational activities, a comprehensive and three-dimensional mental health promotion mechanism is established to provide strong support for the physical and mental development of young students <sup>[11]</sup>.

### **3.3. Building an online education platform to provide diverse psychological services**

From the perspective of new media, constructing an integrated mental health service platform is a key measure to improve the quality of mental health education services for college students. By integrating functional modules such as psychological assessment, knowledge popularization, interactive Q&A, and course learning, it gives full play to the digital and intelligent advantages of new media to provide students with comprehensive and personalized psychological services. The psychological assessment module relies on big data and artificial intelligence technologies to support the accurate evaluation of students’ mental health status. The platform can introduce standardized psychological assessment scales, such as the Symptom Checklist 90 (SCL-90) and Self-Rating Depression Scale (SDS). Students complete the assessment through online questionnaires, and the system automatically analyzes the data and generates personalized reports, intuitively presenting students’ mental health levels in terms of emotion, cognition, and behavior. Meanwhile, based on the assessment results, the platform can intelligently push corresponding mental health intervention plans or resource recommendations, realizing the early screening and early warning of psychological problems <sup>[12]</sup>.

The knowledge popularization module uses the rich communication forms of new media to build a diversified communication matrix for mental health knowledge. It transforms obscure psychological theories into easy-to-understand popular science content in the form of graphics, short videos, and animations, covering basic mental health knowledge, identification of common psychological problems, psychological adjustment skills, etc. Through platform homepage recommendations, special column displays, and personalized pushes, students can conveniently obtain mental health knowledge and enhance their awareness of mental health care. The interactive Q&A module breaks the time and space limitations of traditional psychological counseling and builds a convenient communication bridge. The platform sets up sections such as online expert Q&A and student mutual assistance communication. Students can not only put forward their puzzles to professional psychological counselors and get one-on-one professional answers, but also share experiences and exchange insights in the student community, gaining emotional support through group interaction. In addition, intelligent customer service responds to common questions in real time to improve service efficiency <sup>[13]</sup>.

### **3.4. Establishing a grid management mechanism to promote home-school-society collaborative education**

In response to the development requirements of the new media era, schools should focus on building a more

comprehensive and grid-based educational management system, strengthen the integration of family and social forces, leverage the guiding advantages of schools, and encourage multiple subjects to play their roles in addressing the limitations and shortcomings of traditional education. In the actual implementation process, schools should improve relevant management mechanisms, invite parents and communities to participate in mental health education, jointly guide students' development, and form a dynamic educational system to effectively enhance the effectiveness of education.

First, implement a hierarchical response intelligent intervention mechanism and grasp the core of grid-based management. Based on the risk levels fed back by the monitoring network, formulate differentiated intervention strategies. For low-risk students, push personalized psychological adjustment resources through new media platforms, such as meditation audios and popular science short videos on emotion management, to guide them in self-regulation; for medium-risk students, professional psychological counselors should intervene to provide counseling through online one-on-one consultations and group guidance; for high-risk students, an emergency intervention process should be initiated, and comprehensive support should be provided in collaboration with school hospitals and external professional institutions<sup>[14]</sup>. In addition, the intelligent intervention mechanism can also utilize the interactive characteristics of new media to continuously track changes in students' psychological states and dynamically adjust intervention plans to ensure the effectiveness of intervention measures.

Second, improve the grid-based educational ecology of school-family-community collaboration and create a closed loop for mental health education. Schools can use new media to build a communication bridge between schools, families, and communities, breaking down information barriers. Schools regularly provide feedback on students' psychological dynamics to parents through parent groups and exclusive APPs, and provide family education guidance suggestions; invite parents to participate in online mental health education activities to enhance their awareness of family mental health education. Schools should establish cooperative relationships with communities and psychological service institutions to share students' psychological data and resources, forming a joint educational force. For example, communities can carry out public welfare mental health activities through new media platforms, psychological service institutions can provide professional training support, and medical institutions can open green referral channels, jointly providing solid guarantees for students' mental health<sup>[15]</sup>. Through the effective operation of the grid-based management mechanism, the precision, collaboration, and long-term effectiveness of college students' mental health education in the new media era can be achieved.

## 4. Conclusion

In summary, new media have brought new opportunities and challenges to college students' mental health education. Schools should focus on optimizing mental health education, promoting the in-depth integration of technology and education, enhancing the adaptability of college students' mental health education to the times, and cultivating new-era college students with sound psychological qualities. In the specific implementation process, schools should give full play to the positive empowering role of new media, integrate educational resources, organize diversified activities, build online platforms, and improve management mechanisms, to effectively enhance the quality and level of college students' mental health education. With the continuous innovation of new media technology, college students' mental health education should further keep pace with the times, deepen its integration with new media, and safeguard the mental health of college students.

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# The Value Implication and Implementation Path of the Integration of Mental Health Education in Primary, Secondary and Tertiary Schools

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**Abstract:** In the traditional model where mental health education in primary, secondary, and tertiary schools operates “independently”, problems such as “delayed” psychological activities, insufficient teaching staff, and overlapping curriculum systems are prominent, resulting in a significant lag between mental health education and students’ actual needs. From the perspective of students’ entire learning career, teachers promote the integrated construction of mental health education in primary, secondary, and tertiary schools in the context of high-quality education and further improve the mental health education system. This is not only an inherent requirement for the advancement of education, but also an important guarantee for building a harmonious campus and guiding students to grow into talents.

**Keywords:** High-quality education; Integration of mental health education in primary, secondary and tertiary Schools; Construction; Practice

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## 1. Introduction

The integrated construction of mental health education in primary, secondary, and tertiary schools is an advanced model that focuses on solving the problem of the vertical connection of mental health education across different school stages. It is premised on respecting the differences in mental health education among primary, secondary, and tertiary schools and strengthening their progressive nature. Compared with the traditional mental health education model, it takes into account both the overall advancement of mental health education and the logical progression of students’ individual growth. It can solve problems such as “delayed” psychological activities, insufficient teaching staff, and overlapping curriculum systems, and promote the construction of an all-round and whole-staff pattern of psychological education.



## **2. Current situation of the integrated construction of mental health education in primary, secondary, and tertiary institutions**

### **2.1. Repetition in curriculum systems**

At present, the integrated construction of mental health education in primary, secondary, and tertiary institutions is still in the exploratory and experimental stage. Although certain achievements have been made, there is considerable room for improvement<sup>[1]</sup>. Tertiary institutions design their mental health education content based on the analysis of mental health teaching data from primary and secondary schools and the current needs of college students, aiming to improve educational quality and safeguard students' mental health. A re-examination of this content reveals that relevant educational activities basically revolve around themes such as emotional regulation, interpersonal relationships, and learning status, which correspond to the individual needs of students pointed out in the Report on the Mental Health Development of Chinese Primary and Secondary School Students<sup>[2]</sup>. These issues should have been addressed in mental health education at the primary and secondary levels. In fact, however, students' such needs persist into the tertiary education stage, requiring university mental health education to fill the gaps left by primary and secondary schools in terms of content. This leads to repetition in the mental health education curriculum systems across primary, secondary, and tertiary institutions<sup>[3]</sup>.

### **2.2. Shortage of teaching staff**

The shortage of teaching staff is a common challenge in the development of mental health education in primary, secondary, and tertiary institutions, particularly in some remote primary and secondary schools. These schools may even lack full-time mental health education teachers, assigning related work to teachers of other subjects on a part-time basis. Due to the heavy workload of these part-time teachers, they struggle to allocate sufficient time to mental health education. Additionally, lacking professional backgrounds in psychology and counseling skills, they often feel inadequate for the task. Under such circumstances, the effectiveness of mental health education courses cannot be guaranteed, and students' mental health issues cannot be resolved promptly—this is extremely detrimental both to students' personal growth and the development of mental health education. Furthermore, low salaries and limited career development opportunities are also key factors contributing to the shortage of mental health teachers in primary and secondary schools<sup>[4]</sup>. Mental health teachers in these schools face difficulties in professional title evaluation and have fewer class hours (often being marginalized), resulting in lower incomes compared to core subject teachers or off-campus counselors. This leads many teachers to prefer teaching core subjects or working as counselors in social institutions. Some schools classify mental health teachers as administrative staff or only provide part-time positions, resulting in unclear career advancement paths and little appeal for potential candidates<sup>[5]</sup>.

### **2.3. The “Delay” in psychological development**

From the perspective of advancing the integrated construction of mental health education in primary, secondary, and tertiary institutions, mental health educators in universities are more proactive in related work. This is not only because universities are at the terminal position in this model, but also because college students' psychological pressure tends to be more complex and younger. The younger age tendency of college students' psychological pressure here has two meanings: first, some college students had a low level of mental health in primary and secondary schools, and their negative emotions failed to be effectively alleviated; second, some college students failed to master corresponding emotion regulation methods and learn how to maintain good interpersonal relationships during their primary and secondary school years. Compared with the urgent need

of primary and secondary school students for mental health education, mental health education in primary and secondary schools is “more noise than action” and becomes a mere formality. In primary and secondary schools, many schools are forced to shelve mental health education work for various reasons, resulting in students’ psychological needs not being met promptly, and they have to learn relevant knowledge through mental health education courses in universities. This phenomenon of “delay” in psychological activities reflects the lack of integrated construction of mental health education in primary, secondary, and tertiary institutions. Relevant schools and teachers should pay more attention to students’ psychological needs, promptly help them eliminate negative emotions, learn how to relieve psychological pressure, and cultivate a positive attitude<sup>[6]</sup>.

### **3. Pathways for the integrated construction of mental health education in primary, secondary, and tertiary schools**

#### **3.1. Improve mechanisms and strengthen guarantees**

Mechanisms are the fundamental guarantee for the integrated construction of mental health education in primary, secondary, and tertiary schools. To address problems encountered in practical implementation, education administrative departments at all levels, schools, and teachers should actively promote mechanism construction. By improving institutional mechanisms at the top-level, they can advance and systematically plan the integrated construction of mental health education in an overall manner, ensuring the orderly progress of various construction tasks. Firstly, it is necessary to strengthen top-level design. Guided by the “integrated” work system, the development of mental health education across all stages of primary, secondary, and tertiary schools should be advanced to achieve a consistent pace and unified thinking. Each school stage should clarify its own positioning in mental health education, carry out reforms towards common goals and directions, and jointly build an “integrated” construction framework, which helps to improve the effectiveness of construction<sup>[7]</sup>.

Secondly, mental health education at all stages should adhere to the principle of overall advancement, to promote balanced development and equal resource allocation of mental health education across different stages. For example, relying on superior management forces and combining the characteristics of different school stages, the allocation of mental health education resources should be comprehensively planned, and practical work standards should be formulated. Finally, emphasis should be placed on institutional constraints to ensure effective linkage and connection of mental health education among various stages. For instance, relying on the power of educational administrative departments at all levels to establish rules and regulations, and supervise and guide the actual construction work, to truly break the situation where mental health education at different stages operates “independently” and promote effective linkage among them. Furthermore, it is necessary to clarify the obligations and responsibilities of different stages in the process of linkage and connection, and provide health education services according to the actual needs of students at different stages to avoid “delays” in mental health activities<sup>[8]</sup>.

#### **3.2. Strengthen team building and consolidate the foundation for construction**

Administrators, teachers, and family members at all school stages are the main bodies promoting the integrated construction of mental health education in primary, secondary, and tertiary schools, as well as important forces for promoting the high-quality development of mental health education. Therefore, in the process of integrated construction of mental health education, efforts should be made to strengthen team building from the following three aspects to consolidate the construction foundation.

Firstly, it is necessary to enhance ideological awareness. Student growth is a continuous process that requires full-process mental health education and participation of all parties. Relevant subjects are required to actively link up and earnestly implement construction work, and create a good atmosphere for mental health education through multiple channels and forms <sup>[9]</sup>.

Secondly, professional literacy should be improved. The professional literacy of the team is an important factor affecting the integrated construction of mental health education. Mental health education teachers at all stages should not only strengthen vertical communication and linkage with each other but also enhance horizontal linkage with students' family members. They should guide family members to scientifically analyze the psychological characteristics and common psychological needs of students at different stages and help them master correct methods for family education.

Finally, administrators and teachers at all stages should strengthen educational research. Through seminars, lectures, research projects, and other forms, they should conduct in-depth research on the integrated construction of mental health education in primary, secondary, and tertiary schools, and improve their ability to intervene in students' mental health <sup>[10]</sup>.

### **3.3. Optimizing curriculum resources and strengthening prevention and intervention**

Curriculum resources serve as the primary carrier for the integrated construction of mental health education in primary, secondary, and tertiary institutions, and constitute a key factor influencing the role of mental health education across various educational stages in preventing and intervening in students' negative emotions <sup>[11]</sup>. Therefore, teachers should prioritize the development of curriculum resources, continuously enhancing their effectiveness and relevance to meet the standards and requirements for construction. Specifically, teachers can develop curriculum resources from the following three aspects.

First, curriculum resources should be developed in line with students' development laws, ensuring that the development of mental health education curriculum resources from primary school to university is progressive, logically clear, and holistically designed, in accordance with the physical and mental growth characteristics of students at different stages <sup>[12]</sup>.

Second, they should reflect diversity and meet practical needs. The development of curriculum resources not only emphasizes holistic design but also requires differentiated consideration of the actual needs of students at each stage. This demands that teachers strengthen the analysis of teaching data from four aspects: students' interpersonal relationships, academic pressure, personality development, and physical and mental growth, and develop curriculum resources with a focus on students' psychological needs at different periods.

Third, a problem-oriented approach should be highlighted to ensure the relevance of curriculum resource development. For example, in primary and secondary schools, family environment, parent-child relationships, and academic difficulties are major factors leading to students' negative emotions or even psychological crises, so corresponding curriculum resources can be developed around these themes. For the various psychological pressures faced by college students due to further study and career choices, employment guidance and mental health education courses can be integrated to develop comprehensive curriculum resources <sup>[13]</sup>.

### **3.4. Improving file information and enhancing construction effectiveness**

There is certain repetition in the content of mental health education courses across primary, secondary, and tertiary institutions. Given the limited class hours for mental health education at the university level, excessive repetition may prevent in-depth teaching of content such as life education and love psychology due to time

constraints. Therefore, improving file information, constructing a unified integrated curriculum system for mental health education in primary, secondary, and tertiary institutions, and establishing corresponding evaluation mechanisms are important measures to promote the efficient operation of mental health education courses and achieve ideal implementation effects<sup>[14]</sup>. Sound file information can provide a basis for “linked” intervention and “relay” education in mental health education at different stages, helping to form a synergetic effect and educational joint force. Teachers should establish mental health files for each primary school student, recording changes in their mental health status. In particular, for students with low mental health levels, detailed records of background causes, manifestations, and intervention measures should be included in the files to guide subsequent mental health education work<sup>[15]</sup>. Furthermore, information in students’ mental health files should be transferable, with continuous records of changes in their mental health status throughout their academic journey from primary school to university, to achieve long-term, standardized, and institutionalized file management<sup>[16]</sup>.

## 4. Conclusion

To summarize, the integrated development of mental health education across primary, secondary, and tertiary education emphasizes both the differences and progression of mental health education at different stages, making it an advanced model that strengthens vertical connection. In response to current problems in mental health education, such as the “delay” in psychological intervention, shortage of qualified teachers, and overlapping curriculum systems, teachers can take measures including improving mechanisms, strengthening teacher team building, optimizing curriculum resources, and perfecting file information management. These actions will break the fragmented state of mental health education that exists separately in primary, secondary, and tertiary stages, establish a new pattern of mental health education, and effectively promote the high-quality development of mental health education.

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# A Study on Subtitle Translation of The Good Stuff from the Perspective of Skopos Theory

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**Abstract:** The film *The Good Stuff*, directed by female director Shao Yihui, tells the story of two women with vastly different personalities and life circumstances who meet and become friends. Guided by Skopos Theory, this paper studies the subtitle translation strategies of *The Good Stuff*. The study finds that when translating the subtitles of *The Good Stuff*, the translator fully considered the deep expressive intentions behind the language and applied adjustments based on cultural differences to achieve vivid and effective linguistic conversion of the lines, thereby promoting the dissemination of the film.

**Keywords:** Skopos theory; *The Good Stuff*; Subtitle translation

**Online publication:** November 3, 2025

## 1. Introduction

The film *The Good Stuff*, written and directed by Shao Yihui, tells the story of Wang Tiemei, a single mother who moves to a new home with her child, Wang Moli and meets her neighbor Xiao Ye. The two women have distinctly different personalities: one is tough and the other is gentle; one is good at protecting others and the other is good at forgiving others. Facing old traumas and new challenges, they warm and comfort each other. The film achieved great success both at the box office and in terms of critical acclaim in 2024<sup>[1]</sup>. The dissemination of good content is inseparable from accurate and ingenious subtitle translation, and the English subtitles of *The Good Stuff* have achieved this effect.

Skopos Theory was developed and proposed by Katharina Reiss and Hans J. Vermeer of the German functionalist school based on functionalist theory<sup>[2]</sup>. To address the shortcomings of linguistically oriented theories and other translation theories based on formal equivalence, they put forward a functionalist theory centered on sociocultural purposes<sup>[3]</sup>. The primary principle of this theory is the Skopos Theory, which means that the purpose of translation determines the translation process and thus the target text that achieves the intended function. In other words, the motivation behind translation greatly influences the translation methods and techniques used.

## 2. Overview of Skopos Theory

In the 1970s, German Scholars broke away from the text-centered approach of traditional translation studies and shifted the focus to the target language culture. They began to pay attention to the functions of the target language and the purpose of translation, thereby expanding the perspective of translation studies <sup>[4]</sup>. Katharina Reiss took the lead in classifying texts into three categories based on their functions: informative, expressive, and operative. She pointed out that each category has a different emphasis on the purpose of writing, and translators should adopt different methods to achieve equivalence between the source text and the target text in terms of conceptual content, form, and communicative function. Hans J. Vermeer further argued that translation is a target text created for specific target audiences and purposes in a given context. He emphasized that translators should take the intended purpose of the target text as the starting point of the translation process and choose the optimal translation method based on various contextual factors, rather than focusing on equivalence with the source text. In other words, the “Skopos Theory” is not an option but must guide the translator’s translation strategy.

Vermeer regarded translation as a complex activity. In this activity, translators use new functions, cultural models, and linguistic models in a new context to convey the source language information, while preserving formal features as much as possible. It is not a simple interlingual coding process of words or sentences. On this basis, he proposed the main principles of Skopos Theory: the Skopos Theory, the coherence principle, and the fidelity principle <sup>[5]</sup>.

The Skopos Theory mainly means that the target text should conform to the readers’ understanding and reading habits in the target culture and context. However, this principle does not mean that “a good translation must therefore conform to or adapt to the behavioral patterns or expectations of the target language culture” <sup>[6]</sup>. According to the translation purpose and the recipients’ expectations, translators can either reproduce the source language cultural norms or domesticate them into the target language cultural norms. The degree and form of fidelity depend macroscopically on the requirements of the translation purpose.

The coherence principle, also known as intratextual coherence, requires that “the information produced by the translator (the target text) must be interpretable in a way that is coherent with the target recipient’s situation” <sup>[7]</sup>. That is to say, the recipients should be able to understand the target text, which should have a certain meaning in the communicative environment and culture in which it is involved. Only when people consider the received information to be quite consistent with their environment can the information exchange be said to be successful.

The fidelity principle, also called intertextual coherence, similar to the Skopos Theory, emphasizes that intertextual coherence should exist between the source text and the target text, and its form depends on the translator’s understanding of the source text and the purpose of the translation. The fidelity principle is determined by the translation purpose; it can be a certain connection between the target text and the corresponding source text, or it can be a maximum faithful imitation of the source text.

Skopos Theory holds that the fidelity principle is subordinate to the coherence principle, and both the fidelity principle and the coherence principle are subordinate to the Skopos Theory. “If the purpose of translation requires changing the function of the text, the translation standard is no longer intertextual coherence with the source text, but appropriateness or suitability for the purpose.” If the translation purpose requires the target text to reproduce the characteristics and style of the source text, then the fidelity principle is consistent with the Skopos Theory, and the translator will make every effort to reproduce the style, content, and characteristics of the source text <sup>[8]</sup>.

## 3. A study on film subtitle translation

In recent years, the film industry has undergone a rapid transformation, which has facilitated the cross-border and

cross-regional dissemination of ideas and cultures. The demand for the rapid release of films has made dubbing unable to meet audiences' expectations, accelerating the emergence and development of subtitle translation. Consequently, research on film subtitle translation has emerged as a response<sup>[9]</sup>.

By comparing the differences between film lines and written language, Qian Shaochang proposed that “the social impact of film translation is no less than that of literary translation, as its audience scale is far larger than the latter”. He pointed out that film language possesses five characteristics: audibility, immediacy, comprehensiveness, popularity, and non-annotativeness<sup>[10]</sup>. Li Yunxing, on the other hand, conducted research on subtitle translation from three key dimensions: time and space constraints, the functions and stylistic features of subtitles, and cultural vocabulary in subtitle translation. He argued that the effectiveness of subtitle translation depends on the ability to provide the most relevant information in the most efficient way, that is, balancing time and space constraints while ensuring the accuracy and cultural adaptability of the translation<sup>[11]</sup>. Yang Yan analyzed the technical constraints of subtitle translation and put forward corresponding strategies. She believed that the key to successful film subtitle translation lies in properly balancing the artistic nature of language and the needs and preferences of the target audience. By adopting translation methods that take both aspects into account, cultural exchange can be promoted and existing cultural differences can be bridged<sup>[12]</sup>.

In general, as a special cultural carrier, films bear a wealth of cultural information, and the differences between Chinese and Western cultures pose certain challenges to the Chinese-to-English translation of subtitles for domestic films. Meanwhile, translators need to consider the linguistic expression habits of the film audience.

## **4. The application of Skopos Theory in subtitle translation of the film *The Good Stuff***

In *The Good Stuff*, director Shao Yihui once again sets the story in Shanghai, focusing on the lives of several tenants in a Western-style mansion. The film emphasizes character portrayal through dialogue between people, with lines that are colloquial, concise, humorous, and close to real life. It involves the expression of some social and cultural information, and the translator's handling complies with the three basic principles of Skopos Theory. The translated lines naturally connect the plot and effectively drive its development, highlighting the growth of the characters' personalities.

### **4.1. The Skopos Theory**

As the name suggests, the primary principle of Skopos Theory is to clarify the communicative purpose of the source text and adopt appropriate translation strategies to ensure the target text achieves the same purpose. Let's look at an example below.

Example 1

Source text: “小孩儿”

Target text: Momo

In the film, 10-year-old Wang Moli is called “小孩儿” (literally “child”) by her parents, neighbors, and music teacher. However, in English-speaking countries, parents do not often call their children “kid”; thus, a literal translation is inappropriate. Director and screenwriter Shao Yihui explained the origin of this address in a public interview: She is from Taiyuan, Shanxi Province, and her mother used to call her this way when she was a child. In Shanxi, especially in areas like Taiyuan, Jinzhong, and Yangquan, elders use “孩子” (child) or “娃子” (kid) to address children affectionately, which are used far more frequently than given nicknames. Relatives and

friends also use these two terms instead of children's names when talking about them. Through this address, Shao Yihui is also paying tribute to her mother indirectly. Objectively, this form of address serves another purpose—it weakens gender and highlights the subject. “茉莉” (Moli, Jasmine) is a specific address that even reveals gender, but “小孩儿” refers to a child in general; children around the world are “小孩儿” (children) without specific reference to anyone, and it obscures the gender function. Therefore, what the child says is an expression from an independent individual, unaffected by any gender perspective, deconstructing the bias of adults who have been disciplined in a structured society.

To sum up, the address “小孩儿” (literally “child”) in the film stems from the director's own growth experience and also serves the functions of de-gendering and enhancing children's right to speak. Having clarified the purpose of the source text, the translator made a choice. Foreign audiences are not familiar with the linguistic habits of Shanxi and are likely unaware of the story between the creator and her mother, so this layer of meaning would be hard to perceive even if retained. However, as a typical feminist work, the film aims to break the framework of male gaze in mainstream culture and reverse the traditional gender power structure<sup>[13]</sup>. Women and children are vulnerable groups in the traditional power structure, and enhancing their right to speak is a common theme in Chinese and foreign films. Therefore, the target text “Momo” also weakens the gender implication of Wang Moli's name and highlights the theme of “breaking gender constraints”.

## 4.2. The coherence principle

Translators need to maintain not only coherence within the target text but also connect the translation to the audience's cultural context, ensuring the coherent transmission and understanding of information. The application of this principle is exemplified in two film translation cases below.

### Example 2

Original Text: “谁知道你家这儿这么麻烦啊。”

Target Text: Didn't realize your building was Fort Knox.

This line is an exclamation from Xiao Ye after she is stopped by security guards when visiting her date, Dr. Wang, at his apartment for the first time. A straightforward translation would be to add “it's so troublesome to get in” and render the sentence literally. However, to make the translation more vivid and resonate with foreign audiences, the translator used the American place name “Fort Knox”, ordinarily translated into Chinese as “Nuòkèsībǎo” (诺克斯堡), Fort Knox is a U.S. military base in Kentucky. It serves as the home of the U.S. Army Armor Center and the U.S. Army Recruiting Command. Additionally, it is renowned for housing the U.S. Bullion Depository, which stores a vast amount of gold reserves and acts as a key repository for America's national gold stockpile. It goes without saying that its security measures are extremely strict—foreign audiences will instantly grasp this cultural reference and smile in understanding.

### Example 3

Original Text: “你也堕落了。”

Target Text: How the mighty have fallen.

This line is spoken by a former subordinate of Tie Mei. Tie Mei, once a prominent investigative journalist in China, was forced to join her former subordinate's We-Media company to host live-streaming sales due to the decline of the print media industry. While the original line contains no complex culture-specific terms and could be translated literally, the translator chose to quote the English proverb “How the mighty have fallen” to enhance



the humor of the dialogue. This proverb originates from 2 Samuel 1:19 in the Old Testament of the Bible. In the story, Saul, the first king of Israel, and his son Jonathan were killed in battle against the Philistines. Upon learning of their deaths, David was overwhelmed with grief and composed an elegy that included the line “how the mighty have fallen”—used to lament the passing of the once-powerful Saul and Jonathan, and express sorrow over Israel’s loss of its heroes<sup>[14]</sup>. Later, this phrase evolved into an idiom, used to describe the sudden downfall or decline of a person, enterprise, organization, or even a country that was once powerful, successful, or influential. By referencing this cultural allusion from Anglo-American culture, the translator retained the literal meaning of the original text while successfully conveying the humorous effect of the line to Western audiences.

### 4.3. The fidelity principle

The so-called “fidelity” means that translation activities should establish a connection and responsibility between the source text and the target text based on a purpose-oriented approach. However, this fidelity is not an absolute duplication of the source text’s linguistic form in the traditional sense, but a dynamic functional correspondence. This principle is not the top priority in literary translation; when it conflicts with the Skopos Theory, translators may appropriately “betray” the source text and make reasonable adjustments in the translation. The following case illustrates the translator’s flexible adoption of the fidelity principle.

#### Example 4

Source text: “家人们”

Target text: people

Tie Mei addresses the audience in the live stream as “家人们” (jiārénmen), a common practice among live streamers intended to build an intimate relationship with the audience and enhance interaction stickiness. This not only weakens the commercial atmosphere, making the audience feel like they are part of the streamer’s inner circle and reducing the sense of distance in transactions, but also satisfies consumers’ emotional needs and evokes resonance. However, this effect only holds in a specific cultural context.

The concept of “家和万事兴” (jiā hé wàn shì xīng, meaning “harmony in the family leads to prosperity in all undertakings”) is deeply rooted in China. Chinese people value family harmony and stability, and emphasize amicable relationships among family members. Therefore, the cultural association brought by “家人们” is usually positive and warm. In contrast, Western culture is based on individualism, emphasizing personal freedom, rights, and development<sup>[15]</sup>. Adult children generally leave their parents to live independently, and parents also encourage their children to achieve financial and ideological independence as early as possible to avoid excessive dependence on the family. Westerners pursue personal happiness and rarely sacrifice their personal feelings to maintain family harmony. Due to this cultural background difference, the address “家人们” may not evoke familiarity and affection among Westerners; instead, it might make them feel alienated or even vigilant. Therefore, the translator adjusted the translation to “people,” a term commonly used by Westerners, similar to the Chinese “大家” (dàjiā).

## 5. Conclusion

In recent years, as Chinese culture continues to go global and spread further worldwide, excellent domestic films have also gained more and more foreign audiences. The Good Stuff, as one of the highest-rated domestic films of 2024, embodies the creators’ in-depth thinking on women’s issues and has sparked discussions among audiences. By analyzing the subtitle translation strategies of this film, this paper finds that under the guidance of Skopos



Theory, the translator accurately comprehended the original creators' intentions and skillfully applied Western cultural allusions. This effectively tells Chinese stories to the West and promotes the dissemination of excellent contemporary Chinese culture.

## Disclosure statement

The author declares no conflict of interest.

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# Exploration and Practice Path of Teaching Model Reform for Education Majors in Undergraduate Universities

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**Abstract:** With the continuous advancement of educational reform, the demand for educational talents from the country and society is constantly rising. As a key base for cultivating high-quality education talents, undergraduate universities should keep pace with the times, promote the teaching reform of education majors, optimize talent training models, improve the quality of talent cultivation, and drive the development of China's education cause. Against this backdrop, this paper explores the teaching model of education majors in undergraduate universities. Starting from the characteristics of current education majors' students in undergraduate universities, it briefly analyzes the current situation of the teaching model, and then deeply discusses relevant teaching paths. The purpose is to optimize the teaching model of education majors, improve teaching quality, promote the development of students' professional abilities, cultivate high-quality education talents, and contribute to the development of China's education cause.

**Keywords:** Undergraduate universities; Education major; Teaching model

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## 1. Introduction

In the new era context, the limitations of the traditional teaching model for education majors have become increasingly prominent. It can neither meet the social demand for interdisciplinary talents nor satisfy students' diversified learning needs. Thus, teaching reform has become an important approach for the development and construction of education majors. The traditional teaching model tends to focus on students' mastery of theoretical knowledge while neglecting the development of their other competencies and qualities. The education cause is calling for interdisciplinary and application-oriented talents. Adopting the writing approach of identifying problems, analyzing problems, and solving problems, this paper progresses from teaching dilemmas to talent standards, and then delves into specific strategies. It aims to cultivate high-quality education majors and provide meaningful references for the development of education majors in other undergraduate universities.

## **2. The practical dilemmas of teaching reform in pedagogy majors at undergraduate institutions**

### **2.1. Teaching content needs innovation**

The teaching content of pedagogy majors is relatively theoretical, covering multiple disciplines such as Principles of Pedagogy and Research on Educational Methods. Although students acquire a large amount of knowledge, they tend to face problems such as insufficient depth of learning and superficial understanding. In addition, teachers mainly rely on textbooks for teaching, resulting in relatively fixed teaching content and a single way of presentation. Some teachers find it difficult to flexibly adjust the content according to actual teaching needs and students' learning conditions, leading to low effectiveness and practicality of the teaching content. The knowledge students learn is not aligned with the development of the times and cannot truly meet social demands. Furthermore, classroom teaching of pedagogy majors also suffers from poor interactivity: teachers focus on students' understanding and memorization of knowledge points while neglecting the need to develop their practical abilities, which hinders students' all-around development.

### **2.2. Teaching methods are slightly singular**

Currently, pedagogy majors in some undergraduate institutions mainly adopt large-class teaching. With a large number of students, teachers struggle to cater to the diverse development needs of each student and adopt a “one-size-fits-all” teaching method, which hinders students' personalized development. Influenced by traditional teaching concepts, teaching in some pedagogy majors has the limitation of “valuing theory over practice”—classroom teaching and assessment often focus on theoretical knowledge while ignoring students' needs to develop their practical abilities. Classroom teaching dominated by abstract professional theories tends to create a dull atmosphere, which is difficult to stimulate students' interest and enthusiasm, resulting in insufficient classroom participation and affecting learning effectiveness. Under this model, students do not have a prominent dominant position in classroom activities; instead, they are in a passive and mechanical learning state, showing a tendency to cram for education, and the problem of singularity is relatively serious <sup>[1]</sup>. In addition, with the increasing trend of informatization, some classroom teaching of pedagogy majors has insufficient application of digital technology, still staying at the level of simple electronic courseware display, failing to give full play to the maximum value of digital technology and thus being unable to fully arouse students' enthusiasm for professional learning.

### **2.3. Practical links are relatively insufficient**

The knowledge of pedagogy majors tends to be theoretical, and teachers also focus on students' mastery of theoretical knowledge while neglecting the cultivation of their practical abilities in the teaching process. In terms of teaching methods, they mainly focus on knowledge explanation and case analysis, rarely adopt practical teaching methods, or only set up some simple practical links. There is a lack of practical channels and the cultivation of students' problem-solving abilities. In terms of assessment methods, the focus is on understanding and memorizing knowledge, leading students to concentrate their learning on professional theoretical study, which is not conducive to cultivating students' innovative thinking, critical thinking ability, etc. The teaching method that separates theory from practice may result in students' incomplete understanding of theoretical knowledge and superficial mastery of teaching skills, making it difficult to build a bridge between practice and theory and thus affecting learning effectiveness <sup>[2]</sup>.

### **3. Characteristics of talent cultivated by undergraduate programs in education**

Undergraduate education programs aim to cultivate high-quality talents who master relevant educational theories, possess good practical abilities, and have a certain level of educational literacy, to better integrate with society and actively engage in the cause of education.

First, they have good educational and practical abilities. Education is a discipline that emphasizes the cultivation of practical abilities. Students should not only have solid theoretical knowledge but also develop the ability to apply theoretical knowledge to practice<sup>[3]</sup>. Students majoring in education not only have the ability to engage in basic education in schools, but also should master the capabilities required for work in departments such as educational administration and educational research.

Second, they have a strong sense of innovation. Education is in constant development, but the update of teaching content and methods is relatively slow. Therefore, students majoring in education should have a certain sense of innovation, break free from the limitations of outdated teaching models, dare to innovate teaching methods, develop educational resources, explore new teaching models, and continuously improve teaching quality.

Third, they have a rich knowledge reserve. Education is not an isolated discipline but is closely connected with many other disciplines, such as psychology and sociology, which enable better handling of problems in practical educational work. Based on mastering the content of their major, students majoring in education should continuously learn relevant knowledge to maintain the richness of their own knowledge reserve and the advancement of their knowledge vision<sup>[4]</sup>.

### **4. Reform and practical paths of the teaching model for pedagogy majors in undergraduate universities**

#### **4.1. Clarify teaching objectives and optimize the teaching system**

Undergraduate universities can readjust their teaching objectives based on their school-running characteristics and the actual talent needs of the market, to provide guidance for professional courses and make talent cultivation more in line with the needs of the times. Before formulating teaching objectives, university management should gain a detailed understanding of the actual situation of current social development, such as changes in talent demands for positions corresponding to pedagogy. Then, combined with the university's own reality, such as its professional characteristics, teaching advantages, and faculty level, it should clarify the orientation of professional education and define teaching objectives. Specifically, for talent cultivation targeting basic education positions, emphasis can be placed on developing students' theoretical foundation and social adaptability to meet the needs of teaching and management positions in primary and secondary schools. For students oriented towards research positions, efforts can be made to strengthen their academic research capabilities to cultivate professional talents. To adapt to the new teaching objectives, universities should also appropriately adjust the teaching system and provide a more scientific curriculum structure for teachers and students based on the development of disciplines. The construction of the teaching system for pedagogy majors should reflect professionalism, practicality, and applicability. It can be optimized by dividing it into different modules, with detailed classifications covering aspects such as the theoretical foundation module, professional discipline construction, and practical teaching links<sup>[5]</sup>. It should be noted that teaching objectives and curriculum systems are not static; instead, they should be adjusted based on actual conditions. This requires universities to always pay attention to the development of education, adjust teaching models, improve the quality of talent cultivation, and enhance the adaptability of talent



cultivation to market demands.

## **4.2. Enrich teaching content and improve teaching effectiveness**

Rich teaching content can broaden students' horizons, consolidate their knowledge foundation, and ultimately achieve the goal of improving teaching effectiveness. First, attach importance to the important role of textbooks in classroom teaching. Textbooks are an important basis for pedagogy teaching. Enriching teaching content can start with textbooks—developing high-quality school-based textbooks to help improve classroom teaching quality. Before compiling school-based textbooks, teachers should deeply study the laws of pedagogy textbook compilation, take existing textbooks as the foundation, conduct in-depth interpretation and development, and lay the groundwork for teaching and research work<sup>[6]</sup>. Universities should establish special textbook compilation teams to work together to undertake the task of selecting and developing school-based textbooks. At the same time, they should strengthen academic exchange activities, such as organizing team members to conduct in-depth learning in excellent universities or enhance academic and teaching exchanges with outstanding foreign universities. By continuously learning advanced experiences and excellent research results, they can contribute to textbook compilation and lay a solid foundation for disciplinary development and construction<sup>[7]</sup>.

Textbook compilation should be comprehensively considered from different perspectives and dimensions to ensure practicality. First, it should reflect the development trend of the discipline; second, it should be consistent with the talent cultivation objectives of undergraduate universities; third, it should meet students' needs; and finally, it should reflect the university's educational philosophy and pursuit<sup>[8]</sup>. More importantly, textbooks are important tools to serve teachers and students, so they should be compiled based on teachers' actual teaching needs. With the assistance of textbooks, teachers can better formulate teaching plans, optimize classroom teaching, handle classroom problems, and comprehensively improve teaching quality<sup>[9]</sup>. Second, introduce more time-sensitive teaching content. The education industry is constantly developing, so teachers should uphold the teaching philosophy of keeping pace with the times and continuously introduce new, extended materials, such as modern educational concepts and the latest teaching cases, to broaden students' knowledge horizons and cultivate their awareness of lifelong learning. Interdisciplinary knowledge, such as psychology and sociology, can also be introduced to enable students to better solve practical problems in their future work.

## **4.3. Make full use of information technology and innovative teaching methods**

With the development of Internet technology, information-based teaching has increasingly become an important means of teaching reform. In the teaching of education majors in undergraduate institutions, we should also actively explore the effective application of information technology, innovate teaching methods, stimulate students' learning interest, improve classroom participation, and enhance teaching effectiveness<sup>[10]</sup>.

Firstly, make use of digital teaching resources. The Internet contains a huge number of teaching resources, which are shared, open, and highly timely. It can provide teachers with diversified teaching resources and multiple presentation forms. On the one hand, teachers can provide students with teaching resources in various forms, such as pictures, videos, and virtual scenes, fully mobilizing students' multiple senses, presenting the abstract professional knowledge of education in a concrete form, helping students consolidate the foundation and improve learning effectiveness<sup>[11]</sup>. On the other hand, teachers can timely search for corresponding teaching resources according to teaching needs, optimize classroom interaction, and enhance the interest of teaching. It should be noted that teachers of education majors should improve their information integration ability, be able to quickly collect and screen high-quality teaching resources, and apply them to various links such as lesson



preparation and teaching. This can not only improve teachers' work efficiency and reduce work burden, but also help students better understand professional knowledge and improve learning effectiveness.

Secondly, adopt innovative teaching methods. Teachers of education majors should abandon traditional and outdated teaching concepts, and actively explore newer teaching methods and means to enhance the attractiveness of professional classroom teaching <sup>[12]</sup>. Teachers can introduce modern teaching means, such as artificial intelligence technology, to form personalized learning situation files for individual students, covering their learning situation, future career development direction, learning habits, etc., and intelligently push corresponding teaching videos and extended materials to students. It can also cultivate students' ability to reasonably use modern teaching technology in practical problems, improve students' information literacy, and enhance their competitiveness. Teaching means such as blended teaching method and the flipped classroom can also be adopted to enhance the flexibility of professional teaching. Students can carry out autonomous learning according to their actual situation, greatly improving learning efficiency and teaching effectiveness.

#### **4.4. Strengthen practical teaching and improve comprehensive quality**

In the process of optimizing the teaching mode of education majors, teachers can start by strengthening the cultivation of students' practical ability, setting up various practical courses to help students improve their practical level. Colleges and universities can contact local primary and secondary schools to provide students with sufficient off-campus training opportunities, or build training bases on campus to provide students with sufficient training opportunities and venues. In the process of personal operation, students can consolidate the theoretical foundation, build a bridge between theory and practice, and achieve the double improvement of theoretical foundation and practical ability <sup>[13]</sup>. Colleges and universities should build high-quality teaching teams for students' practical teaching, cultivate excellent teachers with equal emphasis on theoretical teaching and practical guidance ability, and provide real-time guidance for students' practical activities, enhancing students' awareness of the sacred responsibility of education work and helping students accumulate practical experience. Transform textbook content into practical skills, cultivate students' good innovative spirit, collaborative ability, application skills, etc., and finally achieve all-around development <sup>[14]</sup>. In addition, when optimizing the curriculum system, the latest achievements of the development of the education discipline should also be combined, such as the latest theoretical research results of education, national policy documents, etc. On this basis, the proportion of practical courses should be further increased, a more superior practical research environment should be constructed for education majors, and more abundant educational internship opportunities should be provided, so that students can organically combine the learning of theoretical courses with the learning activities of comprehensive practical courses.

### **5. Conclusion**

With the continuous deepening of teaching reform, the teaching mode of education majors in undergraduate institutions is also facing new challenges. The demand for talent in the field of education is constantly increasing. Students should not only have a solid foundation of knowledge, but also have good practical ability, innovative forms, rich knowledge reserves, etc., to adapt to the development trend of education in the new era. However, the traditional teaching mode of education majors has problems such as a single teaching method, poor timeliness of teaching content, and relatively insufficient practical activities. It is becoming more and more difficult to meet the diversified development needs of students, and cannot meet the actual needs of the era for

education talents. Teaching reform is imperative<sup>[15]</sup>. Undergraduate institutions and professional teachers should uphold the teaching concept of keeping pace with the times. By clarifying teaching objectives, introducing digital technology, enriching teaching content, strengthening practical links, etc., optimize the teaching mode of education majors, improve teaching quality, stimulate students' learning interest, promote the all-around development of students' comprehensive abilities, and contribute to the development of China's education cause.

## Disclosure statement

The author declares no conflict of interest.

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# Study on the Characteristics and Guiding Strategies of College Students' Online Social Circling

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**Abstract:** The development of new media technology has promoted changes in the campus environment, among which college students' online social activities have shown an increasingly obvious tendency of "circling". Social circles are characterized by stability and autonomy, making it difficult to accurately convey mainstream values and grasp college students' ideological trends. In response to these issues, colleges and universities need to attach importance to guiding activities, improve students' abilities, encourage their participation in interpersonal communication, and effectively break through the predicament of circling. Starting from the perspective of college students' online social interaction, this paper analyzes the characteristics of circling and proposes specific guiding strategies, aiming to improve the level of college students' online social interaction and provide a reference for subsequent education activities.

**Keywords:** College students; Online social interaction; Circling

**Online publication:** November 3, 2025

## 1. Introduction

With the advent of the information age, community relations have gradually been reconstructed, and new online community models have emerged. In real life, people are incorporated into specific "groups," giving rise to the concept of "circling." In the online society, college students play the role of participants and are easily influenced by online trends, with their thinking, values and behaviors showing obvious circling characteristics. Circling is the social state and living form of college students in cyberspace, which can guide online public opinion and play a role in promotion and integration. However, improper governance and guidance may easily lead to extremism and stereotyping of college students' public opinion expression. By managing college students' online social activities and grasping the characteristics of circling, the effectiveness of education can be improved.

## 2. Characteristics of the clique formation in college students' online social interactions

### 2.1. Stability of online cliques

Cyberspace can mirror real society and play an extended role—for example, stable real-world relationships can

remain relatively stable online. From the perspective of college students' online social cliques, students with shared interests, behavioral habits, and value orientations tend to join the same clique <sup>[1]</sup>. In actual campus life, many college students enter online social circles that interest them; although the information within these circles is similar, they still actively receive the information and content due to their high level of interest. A small number of students believe that the homogeneous information within cliques restricts their information exposure, so they actively try to obtain information through channels other than social media <sup>[2]</sup>. Members of the same online social clique share commonalities: their interests and needs are highly consistent, the information they focus on is strongly homogeneous, and the main body's cohesion continues to increase through actual communication activities, making the clique relationship more stable.

## **2.2. Closure in information acquisition**

The emergence of social cliques has, to some extent, hindered college students' ability to acquire information; only information they pay attention to is allowed to enter the clique, while uninteresting information is usually blocked outside. The unique clique structure can lead to mutual exclusion between different groups and even refusal to communicate <sup>[3]</sup>. In college life, many students engage in social activities within fixed circles and are keen to obtain information and viewpoints from these circles. Some students have a repulsive attitude towards heterogeneous information and are in opposition to those with different views <sup>[4]</sup>. As a result, clique formation tends to confine college students in a closed space where they only receive single and fixed information, focus on information that interests them, and prefer interacting with others who share the same hobbies. This creates "information silos" and makes effective ideological exchanges difficult.

## **2.3. Autonomy in clique selection**

When it comes to choosing online circles, college students demonstrate a strong sense of autonomy. They are capable of understanding cyberspace, building circles independently, and deciding on their own to join or leave a circle <sup>[5]</sup>. Generally, college students will join a social circle based on their own interests and needs, engage in communication and interaction, and form a unique social network. Most college students' online social circles are joined proactively. In the process of circle selection, college students can express their individuality, meet their own subjective needs, make independent judgments based on their personal circumstances, clarify their level of participation in different circles, and thus carry out free communication and interaction, demonstrating good independence and autonomy.

## **3. Negative impacts of online social circles on college students' interpersonal relationships**

Against the backdrop of online social circles, college students are often confined to small cliques, lacking communication with people from diverse backgrounds. This problem leads to narrow interpersonal relationships among college students, making it difficult for them to understand different cultures and accept divergent views. In addition, due to over-reliance on the internet, the social activities they engage in tend to weaken their abilities. With insufficient interpersonal skills, they usually feel confused when faced with real-world social environments. In response, colleges and universities need to pay attention to the negative impact of social stratification and adopt reasonable measures to provide proper guidance and make improvements.



## **4. Guiding strategies for the cliquishness of college students' online social circles**

### **4.1. Integrate era characteristics and cultivate information literacy**

First, attach importance to the offering of information literacy courses. Teachers need to improve curriculum plans and standards, enrich teaching content by incorporating elements such as artificial intelligence and Python programming, to enhance students' information literacy, encourage their active participation in course learning, and foster their abilities in information searching, evaluation, and organization <sup>[6]</sup>. At the same time, attention should be paid to adjusting educational activities to develop college students' comprehensive abilities, improve their information technology knowledge and skills, as well as information ethics, integrate information literacy into these activities, implement comprehensive quality evaluation, focus on the development of educational activities, and carry out diversified teaching practices. The construction of an information-based teaching platform enables students to conduct independent learning and cooperative communication, effectively improves their thinking abilities, and helps college students meet the needs of the times.

Second, carry out information literacy teaching. On the one hand, colleges and universities need to clarify the value of information literacy, attach importance to the realization of the goal of moral education, innovate educational models, formulate scientific information literacy evaluation systems, adopt large-scale tests, and carry out targeted education and training. In the process of education, teachers should emphasize college students' ability to apply disciplinary knowledge, help them solve practical problems, enhance their digital competitiveness, and cultivate comprehensive talents for the new era <sup>[7]</sup>. On the other hand, through continuous exploration, information, knowledge interest groups should be established to infiltrate information literacy into daily study and life, effectively narrow the digital divide, expose college students to cutting-edge knowledge, and practically improve their information literacy.

Third, teachers need to encourage college students to participate in practical activities to effectively improve their information literacy. Teachers should attach importance to students' information literacy, carry out practical activities, and, through adequate consideration and investigation, pay attention to the improvement of college students' information literacy, integrate it into the annual work of colleges and universities, clarify its key points, and truly carry out relevant activities from the school level <sup>[8]</sup>. Teachers can also clarify teaching themes, carry out information-based teaching activities combined with practice and innovation, and adjust project settings, including digital creation, artificial intelligence and programming design, to promote the achievement of the goal of moral education, cultivate college students' information literacy, stimulate their enthusiasm for innovation and improve their practical abilities.

### **4.2. Enhancing communication skills by connecting with real life**

The internet, characterized by virtuality, tends to make college students develop an addictive mentality which leads to personality alienation. Some college students are extremely active on online social platforms, but in real life, they appear introverted and silent, finding it difficult to form a wide social circle. They overly crave emotional and spiritual support in the online world. When college students can effectively express their emotions online, they will develop trust in and dependence on social platforms.

To address the aforementioned issues among college students, higher education institutions need to integrate with real life and carry out a series of teaching practices to help students break free from the constraints of the internet and truly return to real life <sup>[9]</sup>. First, colleges and universities can organize diverse cultural activities to encourage students to step out of their comfort zones, break through the limitations of the internet, and actively engage in real life. When teachers and students participate in offline activities together, it can narrow the distance

between them, help college students make more friends, and effectively expand their social circles. For example, universities can hold various competitions such as sports, singing, and academic contests, which provide students with more opportunities to showcase themselves and build healthy self-confidence.

Second, colleges and universities can encourage students to participate in social practices, such as volunteer services and voluntary teaching <sup>[10]</sup>. Through these activities, students can go to the grassroots level, conduct visits, provide quality social services, broaden their horizons, and continuously enhance their abilities. By participating in the above activities, college students can not only make contributions to society but also integrate into real life, constantly improve their interpersonal skills, reduce their excessive dependence on the internet, and develop a healthy lifestyle.

### **4.3. Promoting social networks and carrying out cross-circle activities**

First, attach importance to the construction of cross-circle social groups. Universities should first clarify the theme and set clear objectives for social groups. Social groups can take specific fields, interests, or cultures as their themes and emphasize communication between different circles. Then, they should enrich group members by recruiting through social media, forums, and other channels to attract people from different circles. At the same time, clear social rules should be established <sup>[11]</sup>. Social groups need to formulate rules such as respecting others and posting appropriate content to maintain harmony and stability within the group. Universities can also hold regular activities such as online and offline gatherings and seminars to facilitate in-depth exchanges of achievements between different circles and deepen mutual understanding <sup>[12]</sup>. Finally, it is necessary to improve the mutual assistance mechanism. Social groups can improve this mechanism to play roles in resource sharing and problem-solving, encouraging members from different circles to conduct in-depth cooperation and communication. These efforts can promote exchanges and interactions between college students from different circles, deepen their understanding of each other, and lay the foundation for in-depth cooperation in the future.

Second, actively carry out cross-circle social activities. Cross-circle activities organized by universities can accelerate the integration of social networks. Teachers can pay attention to students' preferences during activities, select topics they are interested in, such as music and travel, and invite students from different circles to participate, providing them with opportunities for communication and sharing to effectively narrow the distance between each other. Meanwhile, teachers can strengthen activity organization by forming small interest groups, such as reading clubs and yoga groups, to encourage college students from different circles to participate together, engage in pleasant topic discussions, and immerse themselves in activities they enjoy <sup>[13]</sup>. These activities not only help enrich students' spare time but also enable them to meet more friends through participation. In addition, teachers need to organize cross-circle exchange activities, inviting college students from different fields to share their experiences and insights. These teaching practices can help students from different fields interact and cooperate, effectively broaden their horizons, and gain a deeper understanding of knowledge and information. In the face of curriculum teaching activities, teachers should grasp students' needs and objectives, help students from different groups communicate and interact, promote the integration of social networks, and contribute to the healthy development of society.

### **4.4. Emphasizing online ideological and political education to enhance educational affinity**

In ideological and political education at colleges and universities, emotional resonance plays a crucial role. To improve the effectiveness of talent cultivation, teachers need to consider the circled characteristics of college students' online social interactions and attach importance to value guidance. College teachers should focus on

innovating traditional teaching methods, pay attention to college students' emotional needs, strengthen interactive communication with them, and build an equal and harmonious relationship <sup>[14]</sup>. The implementation of the above activities can be more closely aligned with college students' daily lives and practical experiences, thereby promoting the innovation of teaching methods and achieving the goal of "weeding through the old to bring forth the new".

In addition, in ideological and political teaching activities, teachers need to pay attention to college students' daily lives, collect teaching materials from them, carry out effective exploratory activities, and explore language and behavioral styles that meet the needs of college students, so as to make teaching satisfy students' demands. By conducting online ideological and political teaching, we can stimulate college students' interest in learning, enhance the stickiness of ideological and political education, meet the needs of social circling, and make education more affinity <sup>[15]</sup>. At the same time, in online ideological and political teaching, it is necessary to integrate the characteristics of the times and create a good educational environment. By integrating traditional discourse with online discourse, teachers can effectively transform the content of discourse and express it clearly. Through the implementation of the above teaching activities, the integration of professional theories into daily life can be enhanced, making students feel a sense of familiarity and effectively narrowing the distance between teachers and students. The greater efforts made by teachers can make online ideological and political education more penetrating, play a good guiding role, and truly be deeply rooted in people's hearts.

## 5. Conclusion

In summary, the development of new media technology has driven the formation of the circled pattern in college students' online social interactions, and the educational environment has undergone significant changes. Colleges and universities need to pay attention to the circled characteristics of college students' online social interactions, focus on breaking through online information barriers and the constraints of rigid circles, effectively promote circle integration, and enable good communication and connection between circles. To address the above issues, colleges and universities need to integrate the characteristics of the times, adjust talent cultivation activities, and optimize social networks to help students break through social circles. Through the implementation of talent cultivation practices, a good educational environment can be created, a normalized mechanism can be established, risks associated with the circled online social interactions can be effectively addressed, and a good role in political and value guidance can be played.

## Disclosure statement

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# Exploration on the Teaching Path of Higher Vocational Mechanical Major under the Integration of Post-Class-Competition-Certificate

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**Abstract:** In recent years, with the country's high attention to vocational education and the in-depth promotion of the "Post-Class-Competition-Certificate" integration model, the teaching reform of higher vocational mechanical majors has also ushered in new development opportunities. The teaching model integrating "Post-Class-Competition-Certificate" can further improve the talent training model through the methods of "designing courses based on posts, integrating courses with certificates, complementing courses with competitions, and promoting construction through competitions". It not only shows important value in improving teaching quality, but also effectively enhances students' professional skills and comprehensive abilities. This not only meets the requirements of modern vocational education development but also makes positive contributions to students' personal growth and social development. In this regard, this paper explores the teaching path of higher vocational mechanical majors based on the integration of "Post-Class-Competition-Certificate", in order to provide a reference for improving the quality of mechanical professional talent training.

**Keywords:** "Post-Class-Competition-Certificate"; Integration; Mechanical major; Teaching reform

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## 1. Introduction

The development of higher vocational colleges should implement the talent training model of "Post-Class-Competition-Certificate" integration according to the current situation of social talent demand and the needs of students' comprehensive development. Only in this way can the effect of vocational education talent training be truly improved<sup>[1]</sup>. Higher vocational mechanical majors mainly cultivate vocational and technical talents needed by society in mechanical manufacturing, mechanical design, etc. Teachers should focus on strengthening students' comprehensive quality and employment competitiveness in teaching, and help students better clarify the direction of their future career paths. Therefore, teachers of higher vocational mechanical majors should actively explore innovative reform strategies based on "Post-Class-Competition-Certificate", so as to further improve teaching quality and educational effectiveness.



## **2. Connotation and internal logic of the integration of “Post, Curriculum, Competition, and Certificate”**

### **2.1. Analysis of the connotation of the integration of “Post, Curriculum, Competition, and Certificate”**

The concept of integrating “Post, Curriculum, Competition, and Certificate” originates from the modern apprenticeship concept. It emphasizes the organic combination of enterprise work posts, professional curriculum teaching, vocational skills competitions, and vocational qualification certificates to build a new type of multi-subject collaborative education teaching model. Compared with traditional teaching concepts, this concept has successfully broken the separation between “education and industry” and “school and enterprise” in vocational education, realizing the cross-border integration of the education sector and the industrial sector. Specifically, “Post” refers to enterprise work positions, representing the actual work skill requirements and vocational skill standards of enterprise positions; “Curriculum” refers to school professional courses, which shoulder the educational responsibility of imparting theoretical knowledge and basic professional skills; “Competition” refers to industry vocational skills competitions, which can effectively train students’ practical abilities; “Certificate” refers to vocational qualification certificates, which are authoritative certifications of students’ vocational skill levels<sup>[2]</sup>.

### **2.2. Internal logic of the integration of “Post, Curriculum, Competition, and Certificate”**

The four elements of “Post”, “Curriculum”, “Competition”, and “Certificate” are not simply parallel, they have certain internal connections<sup>[3]</sup>.

- (1) “Post”: Enterprise post practice can provide students with more opportunities for practical operations, enabling them to intern and train in real production environments, which is conducive to promoting students to internalize the theoretical knowledge they have learned into professional skills.
- (2) “Curriculum”: Professional curriculum teaching can help students master professional theoretical knowledge and technical skills, which is the premise for students to enter enterprises for post practice and an important foundation for students’ future career development.
- (3) “Competition”: Vocational skills competitions can not only create conditions for the further improvement of students’ practical ability and professional awareness, but also the professional benchmarks (such as new concepts, new skills, etc.) determined in the competitions can point out the direction for the optimization of the school’s professional curriculum system and the reform of talent training models.
- (4) “Certificate”: Vocational qualification certificates are authoritative; they are recognition and affirmation of students’ abilities, and also a powerful credential for students’ employment and career development. When students take exams for relevant certificates, they can test their mastery of knowledge and skills, which is conducive to pointing out a targeted direction for subsequent professional curriculum learning<sup>[4]</sup>.

## **3. Significance of teaching reform in higher vocational mechanical major based on the integration of “Post-Class-Competition-Certificate”**

### **3.1. Conducive to promoting the efficient combination of theory and practice**

Under the “Post-Class-Competition-Certificate” model, the teaching reform of mechanical major aims to eliminate the gap between theory and practice, and adopts post training, classroom teaching, professional competitions, and acquisition of skill level certificates as means to achieve the goal of “unity of knowledge and

action”<sup>[5]</sup>. In this model, students can not only acquire theoretical knowledge in the classroom, but also apply the learned knowledge and skills to practical work. Meanwhile, skill competitions can consolidate and deepen the effect of theoretical teaching, and enrich students’ practical experience. In the process of preparing for skill level certificates, students can systematically review and integrate the theoretical knowledge they have learned, thereby achieving the purpose of combining theory with practice. Therefore, this can help students construct a sound knowledge system, improve their practical application ability, and lay a solid foundation for better carrying out related work in the future<sup>[6]</sup>.

### **3.2. Conducive to improving students’ professional quality and comprehensive ability**

With the implementation of the “Post-Class-Competition-Certificate” teaching model, while focusing on theoretical teaching, it strengthens the cultivation of students’ professional quality and ability. Through this teaching model, students can apply the learned knowledge and skills in various work scenarios to solve different problems, better understand the rules of the industry, improve their professional quality and awareness, and enhance their teamwork and interpersonal communication skills. In addition, participating in various skill competitions can cultivate students’ innovative spirit and competitive awareness, which is of positive significance to their personal development. It enables students to achieve all-round improvement in professional skills, critical thinking, interpersonal communication, and self-management, so that they can better adapt to future work needs and post-challenges<sup>[7]</sup>.

### **3.3. Conducive to enhancing students’ practical application ability**

Practical teaching provides students with opportunities to get in touch with real job positions in the machinery industry. Traditional classroom teaching methods usually only impart some abstract theoretical knowledge to students, but lack the introduction of real practical cases. In practical teaching, however, students can personally experience the specific job contents of the machinery industry and understand the practical problems and challenges they will face in this major in the future. The integrated “Post-Class-Competition-Certificate” model emphasizes practicality. Through practical teaching, students can gain a deeper understanding and application of the theoretical knowledge of the mechanical major, thereby enhancing their practical application ability.

## **4. Teaching reform strategies for higher vocational mechanical majors under the “Post-Course-Competition-Certificate” integration model**

### **4.1. Reconstructing the curriculum system based on the “1+X” certificate standards**

The formulation of talent training programs in higher vocational colleges should be closely aligned with the level requirements of the “1+X” certificate, adhere to the basic orientation of vocational education reform, and organically integrate the concept of “Post-Course-Competition-Certificate” integration into the curriculum system to better meet the demand for high-quality technical and skilled talents. By reasonably arranging the curriculum structure and teaching content, it is possible to not only scientifically organize teaching management and implementation but also flexibly adjust teaching methods, enhance the pertinence of talent training, and cultivate students’ social adaptability. The integration of “1+X” certificate requirements into curriculum content needs to break free from the constraints of disciplinary logic and eliminate curriculum boundaries. For example, courses such as Mechanical Drawing and Fundamentals of Mechanical Design can be integrated to form modular curriculum clusters. Specifically, the main content of the vocational skill level standards for CNC turning and

milling can be taken as a module, split and supplemented in the course CNC Machining Programming and Operation, and embedded into relevant teaching sessions, with the addition of practical training content for processing typical parts to strengthen students' production practice capabilities. In addition, innovations should be made in the arrangement of curriculum logic based on students' growth trajectory: basic courses and knowledge are offered in the early stage to lay a solid foundation, followed by comprehensive practical training. This ensures seamless connection between skill standard assessment and job requirements, truly enabling students to acquire what enterprises need at school and enhancing their adaptability to enterprise recruitment and the industry<sup>[8]</sup>.

#### **4.2. Focusing on the reform of teaching methods to enhance the effectiveness of professional curriculum construction**

Currently, curriculum construction is the core of promoting the "Post-Course-Competition-Certificate" integration. Higher vocational mechanical majors should promote teaching reform from multiple aspects such as curriculum content, teaching methods, and teaching forms, truly focusing on skill improvement and employment orientation, and promoting the organic integration of multiple teaching methods, including theory and practice, online and offline, and on-campus and off-campus, to smooth the talent training path of "Post-Course-Competition-Certificate"<sup>[9]</sup>. At the same time, when carrying out teaching reform in mechanical majors, teachers should give full play to the leading role of classroom teaching and advocate the comprehensive application of teaching methods such as situational, blended, project-based, inquiry-based, cooperative, and interactive teaching. This allows students to explore and learn professional knowledge and skills in specific and real industry environments, thereby integrating knowledge imparting, skill training, and value guidance, and promoting them to apply diverse knowledge, concepts, and skills in practice to effectively enhance their comprehensive quality. For instance, teachers can construct relatively real professional scenarios by playing multimedia videos, simulating vocational scenarios in the machinery industry, and assigning post tasks. Each student is assigned a specific post, enabling them to choose post tasks that match their comprehensive abilities. Students then analyze and discuss project tasks in groups, which effectively improves their professional knowledge, vocational skills, professional literacy, and employability<sup>[10]</sup>. In addition, the emergence of MOOCs (Massive Open Online Courses) allows students to independently learn relevant theoretical knowledge online before class, while class time can be used for research, practice, and problem-solving. This helps students deepen their understanding and application of knowledge more efficiently. Moreover, teachers' adoption of more modern teaching methods can also improve learning efficiency and interest, and provide students with broader and more diverse development paths for their future careers.

#### **4.3. Innovating teaching models to improve the quality of practical teaching**

Innovating teaching methods is key to deepening the quality of practical teaching. The "integration of posts, courses, competitions, and certificates" requires teachers of higher vocational mechanical majors to update their concepts: instead of adopting the "cramming" teaching model, they should use various advanced teaching methods. Firstly, teachers can adopt project-based teaching, taking actual mechanical products or production projects as the teaching carrier and guiding students to complete the design, production, and acceptance of products. For example, in CNC programming teaching, teachers can assign a task of processing complex components of a mechanical product, requiring students to use CNC programming knowledge and machine operation skills for product programming, processing, and measurement. Through completing projects, students not only acquire professional skills but also develop innovative thinking and problem-analysis abilities.

Secondly, case-based teaching can be frequently used, introducing typical cases from enterprise production into the teaching process. With the help of given cases, teachers guide students to analyze and solve problems, thereby cultivating their ability to address practical issues. For instance, in mechanical fault diagnosis teaching, teachers can cite fault cases of enterprise mechanical equipment, allowing students to analyze, discuss, and handle the faults. This helps improve students' practical problem-solving capabilities, professional skills, and career adaptability. Thirdly, cooperative learning can be implemented by dividing students into study groups. Students communicate and assist each other within groups to jointly complete learning tasks or projects. For example, students may be required to collaborate on specific projects in group learning; through project implementation, they jointly accomplish learning objectives, thereby enhancing their professional skills and teamwork abilities.

Meanwhile, teachers can leverage modern information technologies such as VR and AR. For example, in the operation teaching of large-scale and expensive equipment, VR technology can be used to create a virtual operation environment, enabling students to practice equipment operation in a virtual setting and avoiding equipment damage caused by misoperation. AR technology, on the other hand, can integrate virtual information with real scenes. For example, when explaining the structure of mechanical parts, AR devices can help students intuitively view the internal structure of parts, enhancing learning effectiveness, making up for the shortage of training equipment and venues, and improving the quality of practical teaching.

#### **4.4. Establishing mechanical training bases to create an integrated atmosphere**

As an important carrier for the integration of “posts, courses, competitions, and certificates”, the construction level of training bases directly affects teaching effectiveness. To this end, colleges should raise funds through multiple channels, and plan training bases at a high starting point based on the development trend of mechanical majors and the actual needs of enterprises. In terms of site layout, simulate enterprise production workshops and divide functional areas such as processing areas, assembly areas, and testing areas, so that students can become familiar with enterprise production layouts and processes during training. In terms of equipment configuration, not only should conventional mechanical processing equipment (such as lathes, milling machines, and drilling machines) be provided, but also cutting-edge industry equipment, such as advanced CNC machining centers, 3D printers, and industrial robots, should be introduced to enable students to access and master the latest technologies. Secondly, colleges can introduce enterprise management systems and culture into mechanical training bases to create an integrated atmosphere. In specific implementation, the 5S management (SEIRI, SEITON, SEISO, SEIKETSU, SHITSUKE) can be implemented, requiring students to regularly sort and organize training equipment and tools, keep the training site clean and tidy, and cultivate good work habits and professional qualities<sup>[11]</sup>. At the same time, post enterprise slogans in the training base and set up cultural walls to display the enterprise's development history and advanced technological achievements, allowing students to be imperceptibly influenced by corporate culture.

In addition, colleges can cooperate with local machinery manufacturing enterprises to build off-campus training bases, providing students with opportunities to participate in real project practice. For example, students can be arranged to participate in actual enterprise production projects, engaging in the entire process from part processing to product assembly. Enterprise technicians and college teachers can jointly provide guidance, enabling students to deepen their professional knowledge and improve their practical abilities through practice. This truly achieves in-depth integration between colleges and enterprises, and creates a strong atmosphere for the integration of “posts, courses, competitions, and certificates”<sup>[12]</sup>.



#### **4.5. Promote the construction of “Dual-Qualification” faculty teams and strengthen talent support**

Teachers are a key factor in the teaching reform of higher vocational mechanical majors under the integration of “posts, courses, competitions, and certificates”. Schools should provide adequate training for existing teachers, strengthen the development of teaching staff, and conduct teacher training in a planned manner<sup>[13]</sup>. Teachers should be selected to participate in practical training in enterprises regularly, with a duration of 2–3 months per academic year, to gain an understanding of the latest production technology levels, technological processes, and management methods from the frontline of enterprises, thereby accumulating rich practical experience. Schools should encourage teachers to participate in professional training programs, seminars, and skills competitions. For example, teachers can be selected to attend numerical control processing technology training and mechanical design innovation competitions, to continuously update their knowledge structure and professional skills<sup>[14]</sup>.

In addition, schools can focus on hiring technical experts and skilled craftsmen with extensive practical experience from enterprises as part-time teachers. These part-time teachers can undertake certain practical teaching tasks, bringing enterprise production experience and new technologies into the classroom. For instance, inviting enterprise numerical control programming experts to explain the programming skills and experience related to complex parts to students can make teaching content more in line with actual enterprise production. Schools also need to focus on establishing a reasonable teacher evaluation system to motivate teacher development. During the implementation process, for example, teachers’ practical teaching ability, enterprise practice experience, and achievements in guiding students’ practice should be taken as important evaluation indicators. Specifically, the weight of practical teaching ability assessment in teacher performance evaluation can be increased from the current 30% to 40%<sup>[15]</sup>, covering aspects such as practical teaching organization, guidance on students’ practical operations, and the effectiveness of practical teaching.

Teachers who actively participate in enterprise practice and guide students to win awards in skills competitions should be recognized and rewarded, so as to encourage teachers to actively engage in practical teaching reform and the development of their own “dual-qualification” capabilities, thereby providing strong talent support for the teaching reform of higher vocational mechanical majors under the integration of “posts, courses, competitions, and certificates”.

### **5. Conclusion**

In summary, the integration model of “posts, courses, competitions, and certificates” provides new ideas and methods for the teaching reform of higher vocational mechanical majors. By basing on the “1+X” certificate standards to reconstruct the curriculum system, focusing on the reform of teaching methods to enhance the effectiveness of professional course construction, refining vocational ability training to improve students’ post competitiveness, and promoting the construction of “dual-qualification” faculty teams to strengthen talent support, we can effectively improve students’ comprehensive quality and employment competitiveness, and inject inexhaustible impetus into the development of the machinery industry.

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# A Study on the Strategies of Integrating Traditional Art Elements into College Art Teaching

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**Abstract:** Traditional art is not only a manifestation of Chinese art, but also a precious resource in contemporary Chinese humanities education. Applying it to the teaching and practice of college art education can not only enable college students to experience the inherent cultural charm of college art education, but also combine professional knowledge of multiple disciplines with traditional art for creative application. This thereby enables students to continuously improve their artistic appreciation and humanistic literacy, enhance their ability to learn and perceive artistic knowledge, further promote the development of higher education majors and courses, and thus foster their sense of cultural pride and identity. Therefore, this paper deeply analyzes the significance of integrating traditional art elements into college art teaching and proposes corresponding teaching strategies, aiming to expand the application of traditional art in college art education majors and enhance the humanistic educational value of college art education.

**Keywords:** Traditional art elements; College art education; Application strategies

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## 1. Introduction

The goal of college art education is not only to cultivate students' interest in learning language, culture and art, but also to develop their humanistic literacy, emotional attitudes and values, which constitutes an important part of art education. The Guidelines for Public Art Courses in Institutions of Higher Learning overlap with other art course contents in many aspects. When teaching, college art teachers should emphasize the humanistic and artistic nature of knowledge as much as possible, so that college students can have a deeper understanding of it, so as to make up for the deficiencies in the previous vocational education model from the perspective of literacy and artistry. In college art education, the application of traditional art elements is an excellent teaching practice method. In this teaching context, college students can not only devote more spirit and emotion to art learning, but also deepen their understanding of the country and art, realizing the transformation from knowledge to ideology<sup>[1]</sup>.

## **2. The significance of integrating traditional art elements into fine arts teaching in colleges and universities**

### **2.1. Carrying forward national culture and enhancing cultural confidence**

In today's era of increasing globalization, cultural diversity and nationality are particularly important. Carrying forward national culture can not only enhance our cultural confidence but also help the world better understand Chinese culture. As a crucial approach for students' aesthetic education and the cultivation of aesthetic ability, fine arts teaching in colleges and universities urgently needs to integrate traditional art elements. By incorporating these elements into college fine arts teaching, students can gain a deeper understanding of their national culture, thereby enhancing cultural confidence and national pride<sup>[2]</sup>. Specifically, in college fine arts classes, teachers can guide students to appreciate traditional artworks such as Chinese painting, calligraphy, and ceramics, while explaining their historical backgrounds, artistic characteristics, and aesthetic values. Through such teaching, students can better grasp the unique charm and profound heritage of Chinese culture, thus cherishing and taking pride in their national culture. Meanwhile, this kind of teaching also helps foster students' patriotism and national spirit, enabling them to spread and promote Chinese culture more confidently in their future life and work.

### **2.2. Cultivating aesthetic concepts and improving art appreciation ability**

Traditional art elements contain rich artistic forms and aesthetic concepts, such as the artistic conception of Chinese painting, the artistic charm of calligraphy, and the craftsmanship of ceramics. These traditional art forms are not only demonstrations of skills but also unique understandings and perceptions of nature, life, and society. Integrating these traditional art forms into college fine arts teaching can help students develop unique aesthetic views and art appreciation abilities. Specifically, teachers can guide students to appreciate the charm of brush and ink in Chinese painting, the beauty of lines in calligraphy, and the craftsmanship of ceramics in teaching. Through such instruction, students can gradually comprehend the unique charm and aesthetic value of traditional art, thereby developing distinct aesthetic concepts and art appreciation skills. At the same time, this teaching also contributes to improving students' artistic literacy and humanistic quality, making them pay more attention to artistic cultivation and cultural heritage in their future life and work<sup>[3-5]</sup>.

### **2.3. Broadening the vision of aesthetic education and enhancing comprehensive quality**

In contemporary society, having a broad vision and comprehensive quality is a goal everyone should pursue. Integrating traditional art elements into college fine arts teaching allows students to learn about diverse cultures, broaden their horizons, and improve their comprehensive quality. Specifically, traditional art elements are not merely artistic forms or aesthetic concepts but also accumulations of culture and history. By incorporating them into college fine arts teaching, students can understand the history, culture, and social background of the Chinese nation during their studies, thereby better understanding and respecting the cultures of other nations<sup>[6]</sup>. Additionally, this kind of teaching helps cultivate students' cross-cultural communication skills and international perspective, enabling them to better adapt to the trend of globalization in their future life and work.

## **3. Strategies for integrating traditional art elements into fine arts teaching in colleges and universities**

### **3.1. Designing fine arts courses and expanding learning channels**

In traditional fine arts education, it has been extremely challenging to incorporate traditional art elements into

teaching practices. Therefore, colleges and universities can offer elective courses themed on traditional art elements, which not only enable students to gain a comprehensive understanding of the content of traditional art elements but also provide them with access to learning theoretical knowledge related to traditional art. In daily fine arts teaching, teachers can also introduce appropriate traditional art elements, presenting them in the form of teaching materials or extended assignments<sup>[7]</sup>. For example, teachers can combine paper-cutting with spatial composition in fine arts, introducing paper-cutting artworks in class to give students an opportunity to learn about such traditional art elements.

After setting up targeted fine arts courses, schools must also allocate corresponding teachers to ensure that the application of traditional art elements in fine arts teaching does not remain superficial or become a mere formality. Cultivating a dedicated team of fine arts teachers in colleges and universities can create favorable conditions for the organic integration of traditional art elements into regular art courses. We still take paper-cutting art as an example here. Due to its strong practical and artistic nature, colleges and universities can combine paper-cutting art with students' interests, offering it as an elective fine arts course and designing its teaching system, process, and plan based on specific categories of paper-cutting. Specifically, paper-cutting art includes various forms such as flat paper-cutting and three-dimensional paper-cutting. When offering paper-cutting art courses, colleges and universities can align them with the entire semester's schedule, designing course content according to the difficulty levels of paper-cutting and the types of paper-cutting that students prefer, thereby expanding college students' scope of artistic knowledge. College fine arts teachers should innovate and reform their concepts of fine arts education, adjust the content and methods of fine arts teaching, strengthen efforts to develop traditional art elements in fine arts education, and build a fine arts education system that is more suitable for students<sup>[8]</sup>.

In addition, fine arts teachers can collaborate with local professional experts in traditional art to discuss the challenges faced in inheriting traditional art, and on this basis, formulate feasible fine arts teaching plans. This will maximize the preservation of the originality and artistry of traditional art elements, realize the optimization and improvement of folk crafts, and thus ensure the effective integration of traditional art elements into college fine arts teaching. In recent years, some local colleges and universities have offered courses on bamboo weaving, paper-cutting, and clay sculpture, all of which have achieved excellent results. Administrators of colleges and universities that have not yet added such courses can learn from their successful experiences, establish a teaching system of traditional art elements with their own characteristics, continuously strengthen the integration of traditional art elements with contemporary art courses, and offer specialized fine arts education courses. They should also regularly invite relevant off-campus experts to provide guidance, enhance students' understanding of traditional art elements, and continuously improve students' recognition of traditional art.

### **3.2. Conduct practical activities and appreciate artworks**

Art education does not merely require teachers to impart relevant theoretical knowledge to students; it also demands that teachers attach importance to the practical teaching of art. Traditional art elements boast strong regional characteristics, and in the process of using these resources for teaching, emphasis should be placed on practical education. In teaching, teachers can organize activities related to traditional art elements, enabling students to continuously improve their aesthetic literacy while appreciating and participating in these activities. From a professional perspective, teachers should select appropriate traditional art materials based on the subject categories that students need to learn. In addition, they should pay attention to the regional characteristics of traditional art elements, focus on exploring the traditional art of the region where the school is located, and treat



it as an independent art teaching topic. Students are encouraged to learn based on understanding the creative ideas and methods of traditional art elements, and to engage in practice by combining their understanding of relevant cultures. When organizing students to participate in practical activities and appreciate traditional art elements, teachers should take note of the diverse forms embodied in these elements, and actively encourage students to carry out artistic creation based on their own understanding of the works after appreciating traditional art pieces<sup>[9-11]</sup>. For example, after leading students to appreciate New Year painting art, teachers can not only ask students to create New Year paintings using conventional art techniques but also integrate New Year painting art with animation creation, stage design, embroidery craftsmanship, etc., allowing New Year painting art to demonstrate different values in various application forms. In this regard, the author believes that innovation can be carried out on this basis by introducing woodblock New Year painting elements into clothing design to achieve creative practice. At the same time, teachers should provide students with sufficient creative materials to ensure the smooth progress of the practical process, thereby promoting the application of traditional art elements in art teaching in colleges and universities.

### **3.3. Selecting representative works for art education**

Patterns in traditional art are mainly composed of traditional folk art symbols. Over time, these patterns have evolved into a variety of designs and become valuable traditional art elements in art teaching at colleges and universities. Traditional art patterns are the crystallization of the wisdom of the broad masses of Chinese people and can reflect various aspects of social life. Chinese folk opera masks are characterized by bright colors. Since the roles of sheng (male lead), dan (female lead), jing (painted-face male), mo (middle-aged male) and chou (clown) represent different character traits and positions, their masks vary in color and pattern. For example, white masks reflect the suspicious character of the roles in the opera; purple masks are often used to depict righteous characters; black masks highlight the solemn character of the figures; red masks represent loyalty and integrity; gold masks are usually used for depicting solemn immortals; and finally, blue masks tend to represent unruly people. Therefore, when using traditional art elements in college art teaching, teachers can select some cultural patterns with unique characteristics to help students understand the knowledge of color matching in traditional art and its connotations.

### **3.4. Exploring color elements for art education**

Among the numerous traditional Chinese art elements, the colors used in many artworks not only bear distinct regional cultural characteristics but also carry certain epochal features, such as Sichuan Mianzhu New Year paintings. The “woodblock” in Mianzhu, Sichuan, also known as “Mianzhu (woodblock)”, is a traditional craft mainly based on woodblocks, and its production adopts a purely manual “angshi” technique<sup>[12]</sup>. In terms of color application, craftsmen often mix colors according to the principle of “first black, second white, third golden yellow.” “First black” refers to the use of black line blocks; “second white” means the hands, faces, and shoe uppers of the characters are white; “third golden yellow” indicates that the characters’ costumes, clothing, and the objects they hold are in yellow. In addition, there are many other colors, such as yellowish red and pinkish red. Through such bright color combinations, Mianzhu New Year paintings appear vivid and full of charm. When festivals come, they create a warm and festive atmosphere and also reflect the Mianzhu people’s yearning for a better life. Therefore, in college art education, teachers can take Mianzhu New Year paintings as traditional art resources to let students learn the colors used in them and integrate such color knowledge into daily life. In the teaching of painting creation, teachers can present students with paintings that showcase the distinct color

characteristics of Mianzhu New Year paintings, and guide students to select appropriate patterns to match colors according to their specific situations, to achieve a balance between contemporary and traditional styles. Through imitation and creation, students will gradually develop their unique ways of artistic creation.

### **3.5. Learning traditional crafts to enhance personal skills**

Among China's traditional art resources, some artworks have high technical requirements for their creators, and their production methods are also diverse. For example, when coloring lacquerware, lacquer must be applied layer by layer; woodblock New Year paintings require multiple engraving and printing processes to maintain the layering of colors. In addition, the engraving techniques used in arts such as paper-cutting and shadow puppetry, and the thread-setting techniques in embroidery are all unique craft technologies in Chinese traditional culture. Therefore, when college art teachers use traditional art elements in teaching, they should guide students to analyze the creative process, try to learn the production techniques of traditional artworks, and create through imitation and reference. In teaching, teachers can instruct students to organically integrate modern technology with traditional crafts. For instance, students can use lacquer coloring techniques to make kitchenware and jewelry boxes<sup>[13,14]</sup>. Teachers can also analyze the color-matching schemes in traditional art elements to help students understand the different artistic characteristics reflected by various color-matching methods.

### **3.6. Integrating into products to unleash product charm**

The inheritance of traditional art is closely linked to the design and development of artistic products. In college art education, students' awareness of inheriting and innovating traditional culture can be cultivated by exploring traditional art elements and designing related artistic products. In the new era, to highlight the individuality of art teaching, teachers must combine traditional art elements with the design of artistic products, and guide students to integrate traditional art elements into daily life artistic products for creative design. For example, students may be required to use the tie-dyeing technique of blue printed cloth to design artworks. After students complete their designs, teachers can exhibit their excellent works and communicate with local intangible cultural heritage art museums and art product manufacturers to bring their art product designs to the public's attention. Through the design of traditional art products, students can gain a deeper understanding of the characteristics and value of traditional art elements, thereby better inheriting and carrying forward traditional art<sup>[15]</sup>.

## **4. Conclusion**

The inheritance of traditional art is closely linked to the design and development of artistic products. In art education at colleges and universities, students' awareness of inheriting and innovating traditional culture can be cultivated by exploring traditional art elements and integrating them into the design of related artistic products. In the new era, to highlight the uniqueness of art teaching, teachers must combine traditional art elements with artistic product design, and guide students to integrate traditional art elements into daily-life artistic products for creative design. For example, students may be asked to use the tie-dye technique of blue calico to design artworks. After students complete their designs, teachers can exhibit their excellent works and communicate with local intangible cultural heritage art museums and art product manufacturers, so that their art product designs can enter the public eye. Through the design of traditional artistic products, students gain a deeper understanding of the characteristics and value of traditional art elements, thereby better inheriting and carrying forward traditional art<sup>[15]</sup>.

## Disclosure statement

The author declares no conflict of interest.

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# Study on the Talent Training Model of Pedagogy Major in Colleges and Universities in the New Era

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**Abstract:** Against the backdrop of the new era, the innovation of the talent training model for pedagogy majors in colleges and universities has become an important path to respond to the call of the strategy of building a powerful education country. Based on this, the author will, in this paper, focus on the national educational strategic needs and the development laws of the education discipline, put forward corresponding countermeasures for the problems existing in the current talent training of pedagogy majors in colleges and universities, hoping to provide some references and help for readers.

**Keywords:** Pedagogy; Talent training; Higher education

**Online publication:** November 3, 2025

## 1. Introduction

As socialism with Chinese characteristics enters a new era, education has increasingly highlighted its strategic position as a fundamental plan for the country and the Party. The report of the 20th National Congress of the Communist Party of China clearly put forward the general requirements of “accelerating the construction of a powerful education country” and “comprehensively improving the quality of independent talent cultivation”, pointing out the direction for the reform and development of higher education. In this context, the pedagogy major in colleges and universities, as the core position for cultivating professional talents in the field of education, its talent training model not only undertakes the mission of inheriting educational theories and innovating educational practices, but also shoulders the era responsibility of responding to the needs of national educational modernization and serving the high-quality development of education<sup>[1]</sup>.

## 2. Practical dilemmas in the talent training model for pedagogy majors in the new era

### 2.1. Lack of an interdisciplinary competence development mechanism

The talent training model for pedagogy majors in the new era faces multiple practical dilemmas due to the lack of an interdisciplinary competence development mechanism. Currently, the curriculum system of pedagogy



majors is still dominated by traditional disciplinary knowledge frameworks. Although content from related disciplines such as psychology, sociology, and neuroscience has been incorporated, it mostly exists in the form of fragmented knowledge points, lacking a systematic interdisciplinary curriculum design. This makes it difficult for students to establish knowledge connections between different disciplines and form an integrated analytical framework for educational issues. The limitations of such curriculum settings mean that when students face complex practical educational problems, they tend to be confined to a single-disciplinary mindset and struggle to propose innovative solutions from a multi-disciplinary perspective<sup>[2]</sup>.

In terms of the construction of the teaching staff, the lack of an interdisciplinary competence development mechanism is reflected in the singular knowledge structure of teachers. Most pedagogy teachers have long focused on a single disciplinary field and lack an in-depth understanding of cutting-edge theories and research methods in other related disciplines, making it difficult for them to guide students in interdisciplinary thinking during teaching. At the same time, the mechanism for communication and cooperation between teachers of different disciplines within institutions is inadequate, and there is a lack of regular platforms for interdisciplinary teaching and research activities. This makes it difficult to effectively integrate interdisciplinary knowledge into teaching practice, thereby affecting the cultivation of students' interdisciplinary thinking<sup>[3]</sup>.

The inadequacy of interdisciplinary competence development is even more prominent in practical teaching. Currently, the practical teaching of pedagogy majors is mostly limited to traditional school education scenarios, and there is a lack of a linkage mechanism with interdisciplinary practice sites such as psychological counseling institutions and social education organizations. Students thus lack opportunities to apply interdisciplinary knowledge to solve problems in diverse educational contexts. The singularity of this practical model makes it difficult to effectively cultivate students' interdisciplinary application abilities, failing to meet the demand for interdisciplinary talents in the field of education in the new era<sup>[4]</sup>.

## **2.2. Lag in the cultivation of digital literacy in the times**

The talent training model for pedagogy majors in the new era also faces multiple practical dilemmas due to the lag in the cultivation of digital literacy in line with the times. Currently, the integration of digital knowledge into the curriculum system of pedagogy majors remains at the level of technical tool operation. Cutting-edge digital content, such as the educational application of artificial intelligence, learning data analysis, and educational metaverse, lacks systematic curriculum design and is mostly presented in fragmented forms, such as elective modules or lectures. This makes it difficult for students to construct an analytical framework for educational issues in the digital age and form a holistic understanding of “technology empowering education”<sup>[5]</sup>. The lag in such curriculum settings means that when students face practical scenarios such as smart classroom construction and online education operation, they tend to fall into a superficial understanding of “tool use” and struggle to propose innovative solutions from the deep logic of educational digital transformation. Moreover, the lag in the cultivation of digital literacy is even more obvious in practical teaching. Currently, the practical teaching of pedagogy majors is mostly limited to the application of digital tools in traditional classrooms, and there is a lack of a linkage mechanism with digital practice sites such as smart education laboratories and online education enterprises. Students thus lack opportunities to apply digital knowledge to solve problems in cutting-edge scenarios such as virtual simulation teaching and educational big data analysis<sup>[6]</sup>.

## **2.3. Lack of construction of a diversified evaluation system**

Currently, the evaluation system for education majors still centers on standardized tests, with assessments



of students' knowledge retention accounting for over 70%. However, evaluation indicators for new-era core competencies, such as interdisciplinary application ability, educational innovation thinking, and digital practice, are severely lacking. This leads to a structural mismatch between evaluation orientations and the talent demands of the education industry<sup>[7]</sup>. The singularity of this evaluation system forces students to focus most of their energy on memorizing theoretical knowledge during their studies, making it difficult for them to independently develop problem-solving and innovative practical abilities required in educational scenarios. Consequently, a problematic "score-focused, ability-neglected" training cycle has formed.

At the course evaluation level, the absence of a diversified evaluation system is reflected in the imperfect evaluation mechanisms for interdisciplinary and practical courses. Most institutions still use traditional term papers or closed-book exams to assess innovative education courses, lacking scientific evaluation of students' practical outcomes, such as curriculum design proposals and educational case analysis reports. As a result, new teaching models like "project-based learning" and "interdisciplinary workshops" become mere formalities due to the lack of supporting evaluation systems, failing to truly cultivate students' comprehensive literacy. Meanwhile, the subject of course evaluation is singular, relying solely on professional teachers, with insufficient participation from industry experts, practical mentors, and other diverse subjects. This makes it difficult for evaluation results to fully reflect the achievement of course objectives<sup>[8]</sup>.

In the dimension of teacher evaluation, the lack of a diversified evaluation system restricts the direction of teachers' development. Currently, the evaluation of education major teachers mainly focuses on indicators such as the number of research papers and the level of project approvals, while lacking quantitative evaluation standards for teachers' digital teaching capabilities, interdisciplinary curriculum development skills, and practical teaching guidance proficiency. This leads teachers to prioritize academic achievements in their professional development while neglecting the improvement of educational and teaching innovation capabilities. Such an evaluation orientation makes it difficult for the teaching team to form internal motivation to promote the reform of talent training models, further widening the gap between theoretical teaching and practical needs<sup>[9]</sup>.

### **3. Talent training paths for university education majors in the new era**

#### **3.1. Constructing an interdisciplinary integrated curriculum ecosystem**

To build an interdisciplinary integrated curriculum ecosystem for university education majors in the new era, it is necessary to take "Educational Science +" as the core concept to break down traditional disciplinary barriers. While retaining basic theoretical courses in education, interdisciplinary modules should be systematically integrated, and curriculum group construction should be used to transform knowledge from fragmented accumulation to systematic integration, thereby cultivating students' ability to construct multi-dimensional frameworks for analyzing educational issues. Currently, education curriculum systems are often dominated by a single disciplinary knowledge structure. Relevant content from psychology, sociology, neuroscience, and other fields mostly exists as fragmented knowledge points, lacking a systematic interdisciplinary design, which makes it difficult for students to establish connections between disciplinary knowledge. Therefore, reconstructing the curriculum system needs to break through this limitation. For example, courses such as Introduction to Educational Neuroscience, Learning Data Analysis and Application, and Intelligent Education System Design can be offered to systematically integrate interdisciplinary content, such as neuroscientific research on learning mechanisms, data science analysis of educational behaviors, and artificial intelligence optimization of teaching scenarios, enabling students to approach educational phenomena from multi-disciplinary perspectives<sup>[10]</sup>. In

terms of teaching models, a combined form of “theoretical modules + interdisciplinary workshops + project-based learning” should be adopted. Around real educational issues such as “digital transformation of rural education” and “design of inclusive education programs for children with special needs,” students are organized to integrate multi-disciplinary knowledge from education, psychology, data science, etc., to design solutions. This interdisciplinary integrated curriculum ecosystem not only equips students with diverse knowledge reserves but also cultivates their ability to propose innovative educational solutions from an interdisciplinary perspective. It effectively addresses the challenges posed by complex issues in new-era educational practice to talent training and promotes the transformation of education majors from knowledge receivers to interdisciplinary problem solvers<sup>[11]</sup>.

### **3.2. Establishing a diversified and multidimensional educational evaluation ecosystem**

To build a diversified and multidimensional educational evaluation ecosystem for pedagogy programs in colleges and universities in the new era, it is necessary to break through the limitations of standardized tests and construct an evaluation system featuring “competency framework + growth portfolio + industry certification”. Through multi-dimensional indicators, multi-subject participation, and dynamic assessment, this system aims to scientifically measure students’ comprehensive qualities and provide positive guidance. The traditional evaluation system, centered on standardized tests, lacks indicators for assessing new-era core competencies such as interdisciplinary application ability and digital literacy. This disconnects evaluation orientation from the demands of the education industry. Therefore, the first step is to develop a competency indicator database covering dimensions like interdisciplinary application, digital practice, and educational innovation thinking, shifting the evaluation focus from knowledge memorization to capability building. For example, practical tasks such as “designing a teaching plan for educational robot programming” can be used to assess students’ ability to integrate knowledge of pedagogy, psychology, and information technology, thereby changing the single closed-book examination format<sup>[12]</sup>. In terms of evaluation methods, a combined model of “classroom performance + project outcomes + situational tests” is adopted. Classroom performance focuses on students’ collaborative ability and the quality of questions raised in interdisciplinary workshops; project outcomes emphasize practical outputs such as educational program designs and case analysis reports; situational tests simulate real educational scenarios like smart classroom management and home-school communication to assess students’ on-the-spot adaptability and problem-solving skills. For instance, a situational test on “handling unexpected classroom conflicts” can evaluate students’ practical application of educational psychology and class management knowledge. In addition, it is necessary to introduce industry certification standards, such as teacher qualification certificates and educational data analyst certifications, integrating external evaluations into the training quality monitoring system. By aligning with industry standards, the quality of talent cultivation can be driven to improve<sup>[13]</sup>.

### **3.3. Strengthening the full-cycle cultivation of digital literacy**

In the traditional training model, the cultivation of digital literacy faces problems such as fragmented courses, lagging practice, and simplistic evaluation. To address these issues, a compulsory course “Fundamentals of Educational Technology” should be offered at the enrollment stage, systematically teaching basic content such as the operation of intelligent teaching tools and online course design, to help students establish a cognitive framework of “technology empowering education”. For example, learning skills like interactive courseware production and the use of educational resource platforms can lay the operational foundation for digital teaching. In the senior years, elective courses such as “Smart Education Innovation Practice” and “Educational Big Data

Analysis” should be offered, introducing cutting-edge content like educational metaverse and learning behavior prediction models. This forms a stepped course group from basic application to innovative practice, ensuring the in-depth progression of digital knowledge throughout the learning process. In the practical teaching link, a three-level system of “virtual simulation – on-campus training – industry practice” should be constructed. On campus, smart education laboratories should be built, equipped with tools such as educational large model application platforms and learning behavior analysis systems, allowing students to simulate operations like smart classroom design and educational data visualization in virtual scenarios<sup>[14]</sup>.

## 4. Conclusion

In summary, to address practical dilemmas such as insufficient interdisciplinary ability, lagging digital literacy, and a simplistic evaluation system in talent cultivation for pedagogy programs in colleges and universities in the new era, a systematic thinking approach is required. By constructing an “educational science +” interdisciplinary curriculum ecosystem, knowledge from disciplines such as psychology and data science can be transformed into methodologies for solving educational problems. Relying on the diversified evaluation system of “competency framework + industry certification”, an evaluation transformation from “score-oriented” to “literacy-oriented” can be realized. Through the stepped course group and three-level practical system, a full-cycle cultivation closed loop for digital literacy, “from foundation building at enrollment to improvement after employment”, can be formed<sup>[15]</sup>. This path not only responds to the demand for compound talents in the strategy of building a strong education country but also promotes the transformation of pedagogy professionals from knowledge inheritors to constructors of an educational innovation ecosystem through the collaborative reform of courses, evaluation, and practice, providing sustainable talent support for the development of educational modernization.

## Disclosure statement

The author declares no conflict of interest.

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# Exploration on the Teaching of Veterinary Microbiology under the Background of New Agricultural Sciences

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**Abstract:** With the development of the construction of New Agricultural Sciences, animal medicine majors have entered a new stage of educational reform. Colleges and universities should adhere to the basic goal of “fostering virtue through education and strengthening agriculture to revitalize agriculture”, conduct an in-depth analysis of the reform needs of the Veterinary Microbiology course in terms of interdisciplinary integration, practical reform, and the integration of ideological and political education into courses. On this basis, they should promote the update of teaching content, the innovation of teaching methods, the reconstruction of the experimental teaching system, and the optimization of the assessment and evaluation mechanism, to create favorable conditions for the cultivation of compound talents in animal medicine majors. Against this research background, this paper expounds the requirements put forward by New Agricultural Sciences for the teaching reform of Veterinary Microbiology, summarizes the reform dilemmas faced by the teaching of Veterinary Microbiology, and proposes the teaching reform strategies of Veterinary Microbiology under the background of New Agricultural Sciences, to provide support for colleges and universities to cultivate outstanding talents with both professional capabilities and feelings for agriculture, rural areas and farmers.

**Keywords:** New agricultural sciences; Veterinary microbiology; Teaching reform

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## 1. Introduction

Under the background of the construction of New Agricultural Sciences, the cultivation of talents in animal medicine majors emphasizes interdisciplinary integration, the integration of production and education, and the service for rural revitalization. Therefore, in the teaching reform of the Veterinary Microbiology course, teachers should rely on the background of the construction of New Agricultural Sciences to promote the reform and innovation in aspects such as course content, teaching methods, experimental activities, and assessment and evaluation, solve the problems existing in the current teaching model, and achieve the goal of coordinated development and in-depth integration of Veterinary Microbiology teaching with industrial needs, cutting-edge



scientific research, and ideological and political education.

## **2. The requirements of the new agricultural disciplines for the teaching reform of veterinary microbiology**

The development of New Agricultural Disciplines has put forward new requirements for the cultivation of talents in animal medicine majors. As a core course for animal medicine majors, the teaching reform of Veterinary Microbiology must also follow the basic concepts of the development of New Agricultural Disciplines. Specifically, colleges and universities as well as teachers, should carry out innovation and optimization from the following aspects:

- (1) Adhere to the integration of interdisciplinary knowledge. The development of New Agricultural Disciplines adheres to the principle of “interdisciplinary integration between agriculture and engineering, and integration of agriculture and science”. Therefore, it is necessary to integrate knowledge such as bioinformatics, molecular biology, and big data analysis into the Veterinary Microbiology course, to achieve the goal of cultivating interdisciplinary talents through interdisciplinary integration<sup>[1]</sup>.
- (2) Adhere to the goal of cultivating practical and innovative capabilities. The New Agricultural Disciplines emphasize the cultivation of comprehensive talents with practical skills. This requires teachers to focus on the development of students’ experimental skills, scientific research thinking, and problem-solving abilities based on the concept of “learning by doing”.
- (3) Adhere to the principle of social service orientation. The New Agricultural Disciplines aim to promote the development of China’s agricultural industry and rural revitalization through talent cultivation. This requires teachers to base themselves on the actual needs of animal husbandry production and the development requirements of the regional agricultural economy, and promote the innovation of course content and teaching methods<sup>[2]</sup>.
- (4) Adhere to the reform and development of information-based teaching. Teachers should give full play to the advantages of information-based teaching methods, such as virtual simulation experiment platforms and online course platforms, break through the temporal and spatial limitations of traditional teaching, and create an open and independent learning environment for students.
- (5) Adhere to the orientation of the fundamental task of fostering virtue through education. Colleges and universities should take the cultivation of “feelings for agriculture, rural areas and farmers” as the foundation, integrate ideological and political elements such as “biosafety” and “ecological civilization” into curriculum teaching, to provide a platform for practicing the fundamental task of fostering virtue through education and promote the development of students’ professional quality, craftsmanship spirit and scientific research spirit.

## **3. The dilemmas of veterinary microbiology teaching reform in the background of new agricultural sciences**

### **3.1. Backward construction of the curriculum system**

With the continuous upgrading of relevant technologies and research equipment, frontier research in the field of veterinary microbiology is developing rapidly. However, there is a lag in the veterinary microbiology textbooks currently used by colleges and universities. On the one hand, the curriculum content mainly focuses

on microbiology theories, lacking sufficient practical projects, experimental activities, and real scientific research cases. On the other hand, cutting-edge research achievements have not been integrated into the curriculum system. For example, there is a lack of detailed explanation and introduction to technologies such as gene editing and synthetic biology <sup>[3]</sup>. In addition, the experimental courses of veterinary microbiology also have certain defects. For instance, most of the experimental projects are “confirmatory” experiments, lacking comprehensive design-oriented experimental projects, and the introduction of clinical research cases is also relatively scarce.

### **3.2. Single and outdated teaching methods**

In the teaching of veterinary microbiology courses, some teachers have formed fixed teaching habits and long-termly adopted the teaching mode of “lecture + confirmatory experiment.” On the one hand, they teach theoretical knowledge relying on PPT courseware; on the other hand, they require students to complete practical exploration step by step. This leads to a lack of platforms and opportunities for students to participate independently, practice cooperatively and express their subjective opinions in teaching activities. It not only results in insufficient interaction between teachers and students, but also affects students’ initiative and enthusiasm <sup>[4]</sup>. In addition, in the construction of ideological and political education in courses, teachers have not adopted scientific teaching methods either, leading to a weak connection between ideological and political cases and professional knowledge. Even resistance from students may arise in the implicit ideological and political education, making it difficult to achieve the goal and effect of implicit education.

### **3.3. Poor effect of industry-education integration**

Industry-education integration is an important trend in the cultivation of animal medicine professionals in the background of New Agricultural Sciences, and also a key means for the reform of veterinary microbiology courses. However, at present, the measures taken by colleges and universities in industry-university-research collaboration have achieved poor results. On the one hand, university-enterprise cooperation mainly focuses on the construction of internship bases, and enterprises do not have sufficient space and platforms to deeply participate in links such as curriculum design, teaching content selection, and experimental project design, which makes industry-education integration lack practical effects <sup>[5]</sup>. On the other hand, colleges and universities have relatively few cooperations with relevant scientific research institutions, failing to connect the latest scientific research achievements with the existing curriculum system, and also unable to provide students with scientific research channels for independent experimental exploration.

### **3.4. Poor orientation of the evaluation system**

In addition, there are also obvious problems in the construction of the evaluation system. Firstly, in the assessment and evaluation of veterinary microbiology, teachers mainly score based on students’ final exam results, failing to establish a diversified evaluation subject and process-oriented evaluation links <sup>[6]</sup>. Secondly, there is a lack of a sound evaluation system and index requirements, ignoring the development of students’ literacy in various aspects such as experimental design ability, scientific research thinking ability and teamwork ability. Thirdly, the guiding role of teaching evaluation is ignored, and suggestions for students’ improvement and optimization are not put forward based on the evaluation results, resulting in insufficient application effects of evaluation.

## **4. Teaching reform strategies for veterinary microbiology in the context of the new agricultural sciences**

### **4.1. Optimizing the curriculum system to highlight the guiding role of the new agricultural sciences**

Against the backdrop of the development of the New Agricultural Sciences, the core goal of the teaching reform for Veterinary Microbiology should be to cultivate students' interdisciplinary thinking, practical abilities, and innovative capabilities. Based on this goal, the curriculum system should be optimized and designed.

- (1) Colleges and universities should keep pace with the development of cutting-edge technologies and establish three curriculum modules: “Fundamentals”, “Cutting-edge”, and “Application”. The Fundamentals Module focuses on classic microbiological knowledge such as bacteria and viruses, aiming to consolidate students' theoretical foundation. The Cutting-edge Module sets up key knowledge topics related to the frontier of veterinary microbiology development, such as “microbiome technology” and “gene editing and microbial modification”, to broaden students' cognitive horizons<sup>[7]</sup>. The Application Module should align with the development needs of regional industries and develop project cases for students' practical learning based on the actual situations of enterprises, such as practical projects like “surveillance of antimicrobial resistance in pathogenic microorganisms of livestock and poultry” and “development of fermentative microbial resources”.
- (2) Colleges and universities should adhere to the concept of interdisciplinary development, with “the integration of agriculture and engineering, and the combination of agriculture and science” as the basic guiding principle. They should integrate knowledge from disciplines such as bioinformatics, molecular biology, and big data analysis into the Veterinary Microbiology course. For example, in the teaching module of animal disease prevention and control, relevant content such as microbiome technology and gene sequencing data analysis can be introduced, and based on this, extended learning modules like “the mechanism of interaction between microorganisms and hosts” and “genomics of microbial antimicrobial resistance” can be developed<sup>[8]</sup>.
- (3) Colleges and universities should also insist on the in-depth integration of ideological and political education into professional education, and highlight the infiltration and guiding role of ideological and political elements in the existing curriculum system. For instance, in the relevant courses of “immunological prevention”, teachers can explain the basic ideas and strategies adopted by China in the fight against the epidemic to students, so as to strengthen students' awareness of the “community with a shared future for life”<sup>[9]</sup>.

### **4.2. Improving teaching models and developing diversified teaching methods**

Against the backdrop of the construction of the “New Agricultural Sciences”, universities should further implement the fundamental educational principles of “student-centeredness” and “teaching students in accordance with their aptitude”. On this basis, they should promote the application and implementation of diversified teaching methods in the teaching of Veterinary Microbiology, to create an open and independent learning space for students.

First of all, teachers should promote the development and application of information-based teaching. On the one hand, they should promote the construction of the flipped classroom model and implement teaching tasks through both online and offline channels. Before class, basic theoretical teaching guidance can be provided through resources such as MOOCs (Massive Open Online Courses) and micro-courses; during class, these

platforms can be used for student discussions, experimental design, and collaborative exploration, thereby enhancing the interaction between teachers and students and fostering students' practical abilities<sup>[10]</sup>. On the other hand, teachers should leverage the auxiliary teaching advantages of tools such as virtual simulation technology and computer equipment. For example, the KoPaWiFiEDU microscopic digital system can be used to share the observation results of bacterial morphology in real time, and animation technology can be employed to visually present the physiological structure and life activities of viruses, helping students gain a better understanding and comprehension<sup>[11]</sup>.

Secondly, teachers should promote the popularization of teaching methods such as problem-driven teaching, project-based teaching, and task-based teaching, and introduce real scientific research problems or enterprise work tasks into the classroom. For instance, project activities like "Tracking the Mutation of Avian Influenza Virus" and "Optimizing the Detection Technology of African Swine Fever Virus" can be carried out. By organizing students to conduct group-based literature research, collaborative discussions, and comprehensive presentations, their independent learning abilities can be strengthened<sup>[12]</sup>.

In addition, teachers should also improve experimental teaching strategies. Based on traditional confirmatory experiments, more design-oriented experiments should be developed to cultivate students' scientific research capabilities. For example, an experimental project titled "Investigation on Toxoplasma Gondii Infection in Stray Cats on Campus" can be designed. All experimental steps, including sample collection, PCR detection, and data analysis, are assigned to student teams for independent design and completion, so as to achieve a better educational effect through experiments<sup>[13]</sup>.

#### **4.3. Adhere to collaborative education and deepen the university-enterprise-research institute cooperation mechanism**

Against the background of the integration of industry and education, universities should also promote the teaching reform of Veterinary Microbiology from the perspective of university-enterprise-research institute cooperation, so as to provide students with more diversified learning resources and practical platforms.

Firstly, universities should actively cooperate with veterinary drug enterprises, livestock farms, and other relevant entities. On one hand, they can jointly establish cooperative laboratories, where senior university teachers and corporate researchers collaborate to develop new technologies and create opportunities for students to participate in related projects. On the other hand, based on the actual conditions of enterprises, universities can build an "Enterprise Real Case Resource Library".

Secondly, universities can also cooperate with vaccine manufacturers and develop specialized content, such as "Avian Influenza Vaccine Production Technology" into experimental teaching projects. This enables students to engage in the entire vaccine production process, from "strain cultivation to finished product quality inspection"<sup>[14]</sup>.

Furthermore, universities should promote the training of "dual-qualified teachers" (teachers with both academic expertise and industry experience) through university-enterprise-research institute cooperation. On one hand, they can hire corporate technical experts and researchers as part-time course instructors, who will participate in educational activities such as experimental teaching, practical projects, and special lectures. On the other hand, universities can jointly establish teacher enterprise practice mobile stations with enterprises, allowing teachers to participate in various links of enterprises, including scientific research, production, marketing, and management, thereby enhancing their comprehensive capabilities.



#### 4.4. Conducting diversified evaluation and building a process-oriented assessment model

Against the backdrop of the “New Agricultural Sciences” initiative, universities should further promote the innovation and optimization of the teaching evaluation model for Veterinary Microbiology, while advancing reforms in diversified evaluation subjects and process-oriented evaluation.

First, in terms of assessment methods, teachers should divide the evaluation content into four dimensions. Among them, students’ exam scores account for 40%, which assesses their ability to apply knowledge. Experimental assessment accounts for 30%, focusing on evaluating students’ logic in experimental design and data analysis capabilities. Research proposals account for 20%, which assesses students’ ability to write research plans and experimental reports. Daily academic performance accounts for 10%, mainly evaluating students’ learning enthusiasm, teamwork skills, and contribution to group work<sup>[15]</sup>.

Second, in terms of assessment subjects, modules such as teacher evaluation, students’ self-evaluation, group evaluation, and mutual evaluation among students should be established. In addition, a “defense system” can be introduced for the final assessment, requiring students to present their learning achievements through PPT, with joint review by judges (teachers) and enterprise experts.

### 5. Conclusion

To sum up, the “New Agricultural Sciences” initiative provides a new direction and development trend for the teaching reform of Veterinary Microbiology. Based on this, universities should carry out optimization in aspects such as the curriculum system, teaching model, integration of industry and education, and evaluation system. This will drive the course towards higher-level, more creative, and practical development, thereby cultivating compound veterinary talents that meet the needs of contemporary agriculture.

### Disclosure statement

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# The Current Development Status and Path Selection of China's Ice and Snow Infrastructure Under the Background of the Beijing Winter Olympics

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**Abstract:** With the successful hosting of the Beijing Winter Olympics, ice and snow sports in China have attracted greater attention from the public, and the construction of relevant infrastructure should also be further optimized. We should actively introduce new technologies and infrastructure to promote the further development of China's ice and snow infrastructure. In view of this, this paper analyzes the development of China's ice and snow infrastructure in the background of the Beijing Winter Olympics and puts forward some strategies, which are for reference only by colleagues in the field.

**Keywords:** Beijing Winter Olympics; Ice and snow infrastructure; Development; Current status and path

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## 1. The significance of the development of China's ice and snow infrastructure against the background of the Beijing Winter Olympics

### 1.1. Conducive to the construction of a sports power

With the successful hosting of the Beijing Winter Olympics, ice and snow sports in China have entered a new stage of development. A growing number of people have participated in ice and snow sports, which has laid a solid foundation for China to build itself into a sports power. Ice and snow infrastructure is an important part of China's strategic development; to a certain extent, it has also enabled the breakthrough and innovation of China's competitive sports technology, and laid a solid foundation for the grand goal of "300 million people participating in ice and snow sports"<sup>[1]</sup>. The construction of the Winter Olympics venue cluster has achieved a breakthrough in traditional sports facilities, making the single function and positioning more diversified. It can invisibly promote closer integration between public sports services and international event standards, and form a new sports space model with strong demonstration effects. Under this model, in addition to innovating

the previous forms of sports and training, it can also cultivate more high-quality talents for the country's ice and snow sports. Through the extension of some inclusive infrastructure, the national strategy of nationwide fitness can be better implemented <sup>[2]</sup>. In this process, the technological content, technical level, and service level of ice and snow infrastructure have become important criteria for the modernization of sports, and the quality of infrastructure development is closely related to China's goal of becoming a sports power.

### **1.2. Conducive to the dissemination of ice and snow culture**

Against the background of the Winter Olympics, the development and construction of ice and snow infrastructure can enable people to spread ice and snow culture more effectively, allowing ice and snow culture to have a more far-reaching impact on more people invisibly. During the Winter Olympics, the construction of regional ice and snow sports centers and the use of technologies such as indoor ice rinks and artificial snowmaking can break the restrictions of geographical and climatic factors on ice and snow sports. This physical expansion can not only further expand the scope of ice and snow sports, but also enable more people to gain a new understanding of ice and snow sports, making activities originally limited to winter accessible throughout the year <sup>[3]</sup>. This year-round participation can help more people develop new interests in and understanding of ice and snow sports, encouraging them to more actively explore the culture and skills of ice and snow sports, creating more high-quality cultural communication scenarios, and enabling ice and snow sports to penetrate from professional competitions into daily life. This cultural transformation can not only upgrade people's concept of sports consumption but also invisibly enhance national cultural confidence, allowing ice and snow culture to penetrate into daily life at a higher level. Thus, it can invisibly build a sports culture system in the new era and provide a better path for the dissemination of ice and snow culture.

### **1.3. Conducive to enhancing modern governance capacity**

Against the backdrop of the Beijing Winter Olympics, the development of ice and snow infrastructure can, to a certain extent, enhance the modern governance capacity of relevant authorities. This enables more rational utilization of ice and snow infrastructure and the establishment of a new institutional system with greater demonstration value. The cross-regional collaboration approach allows for wider application of ice and snow infrastructure, facilitating a higher level of integration between resources and the market. The Beijing-Tianjin-Hebei region can foster an environment characterized by industrial collaboration and joint ecological governance, laying a solid foundation for the implementation of various subsequent initiatives <sup>[4]</sup>. Furthermore, other northern regions can learn from the ice and snow infrastructure development experience of the Beijing-Tianjin-Hebei region, adapt it to their local realities, carry out reforms and optimizations, and replicate successful practices. By experimenting with different operation models, deeper integration between market resources and government public services can be achieved. This also helps establish a green technology standard system, promote low-carbon construction models, and set a demonstration example for the utilization of large-scale public facilities. These institutional achievements can not only be applied to ice and snow sports but also be practically used in other projects, providing new ideas and methods for the construction and governance of public-domain facilities.

## **2. Current development status of China's ice and snow infrastructure**

### **2.1. Stock advantages and transformation dilemmas of Winter Olympic heritage**

Against the backdrop of the Beijing Winter Olympics, China's ice and snow infrastructure faces certain issues

regarding transformation and stock advantages. After the Beijing Winter Olympics, there has been an oversupply in the number of such infrastructure facilities, which inadvertently consumes significant resources and incurs high maintenance costs. Failure to utilize ice and snow infrastructure reasonably will greatly hinder its future development<sup>[5]</sup>. In the construction of ice and snow infrastructure, intelligent management systems and modular design concepts have been applied, providing a certain foundation for the subsequent transformation of these facilities. However, there is a discrepancy between the positioning of many professional ice and snow venues and the actual needs of the general public, which easily leads to low utilization rates of ice and snow infrastructure. For some small and medium-sized ice and snow infrastructure facilities, seasonal fluctuations result in situations of insufficient supply and resource idleness. From a deeper perspective, a large number of people have not yet developed the habit of participating in ice and snow sports, and the public's initiative to engage in such sports is relatively low. These factors also inadvertently impede the development of ice and snow infrastructure.

## **2.2. The practical contradiction between ecological constraints and technological dependence**

To a large extent, people can break through the limitations of natural conditions by using artificial snow-making. However, this also gives rise to new environmental challenges to a certain degree. Excessive development of natural ski resorts in northern China will lead to problems such as soil erosion and damage to mountain vegetation. In the long run, this will form a comprehensive ecological pressure together with the heat island effect and refrigerant pollution caused by artificial ice rinks in southern China, exerting an extremely adverse impact on the environmental development of our country<sup>[6]</sup>. Moreover, in the process of constructing ice and snow infrastructure, there are also issues like excessive consumption of water resources and energy. The daily water consumption of some ski slopes can reach hundreds of tons, and the corresponding refrigeration systems will invisibly increase the regional energy load, even affecting the electricity use of surrounding residents. This development model has a significant impact on the natural ecology and is inconsistent with China's concept of sustainable development. How to reduce the impact on the environment while developing ice and snow infrastructure has become an important issue that needs to be addressed urgently. Some regions have solved the problem of insufficient water resources by collecting rainwater, and can also use models such as photovoltaic power generation to address the issue of energy shortage. However, large-scale promotion is still restricted by technology and costs.

## **2.3. Structural defects in the safety guarantee system**

In ice and snow sports, safety is a key issue that requires attention. During the development of ice and snow infrastructure, there is a problem of insufficient safety guarantee systems. Accidents often occur in actual ice and snow sports, which greatly hinders the application of ice and snow infrastructure. Ice and snow sports themselves carry relatively high risks. If the safety guarantee capacity of infrastructure is insufficient, it will have a major impact on the development of subsequent work<sup>[7]</sup>. In the construction of ice and snow infrastructure, there is an imbalance between safety and professionalism. These problems are mainly reflected in the unreasonable setting of slope gradients, insufficient design of buffer zones, and the lack of corresponding protective devices—all of which reduce the safety of people participating in ice and snow sports. In addition, in the construction of many ice and snow infrastructure projects, professional rescue personnel are not equipped, and the update of various first-aid equipment is also insufficient. This makes it difficult to rescue the injured on time when dangers occur, which also increases the psychological threshold for participating in ice and snow sports to a large extent. If

safety problems occur at ice and snow venues, the operating entities may be involved in legal disputes, which will also hinder the popularization of ice and snow sports to a certain extent.

### **3. Development paths of China's ice and snow infrastructure**

#### **3.1. Establishing a full-cycle sustainable development mechanism**

Against the background of the Beijing Winter Olympics, to further promote the development of China's ice and snow infrastructure, it is essential to establish a more rational and scientific sustainable development mechanism. This will lay a solid foundation for future work and ensure the rational use of resources. To this end, relevant departments can establish a more reasonable management system, well manage the planning, operation, and evaluation of ice and snow infrastructure, and provide more flexible space for venue planning, which can further optimize the venues. In practice, a modular approach can be adopted for the construction and development of ice and snow infrastructure to enhance its adaptability. To further improve the application effect of ice and snow infrastructure, it is necessary to adhere to the concept of "four-season operation" in design and related work. By introducing projects such as land curling and roller skating, the seasonal fluctuations of venues can be reduced, ensuring the rational use of ice and snow infrastructure in all seasons<sup>[8]</sup>. In addition, we also need to optimize and expand the evaluation system, so that more resources can be reasonably used in the construction of ice and snow infrastructure, enabling ice and snow venues to exert greater social benefits. At the same time, in the evaluation process, the scope of evaluation content should be further expanded, and factors affecting the ecology should be included in the evaluation items. This can realize the dynamic monitoring of the ecological environment and form a better feedback mechanism. Based on local actual conditions, the government can foster some new ice and snow consumption industries. By integrating ice and snow sports with rehabilitation and education, the multi-dimensional expansion of the value of ice and snow infrastructure can be achieved.

#### **3.2. Promoting the parallel development of green technology innovation and ecological compensation**

Against the background of the Beijing Winter Olympics, to further improve the development effect of ice and snow infrastructure, we should promote the application of green technology. This can realize ecological protection, thereby achieving the parallel development of green technology and ecological protection. In the construction of ice and snow infrastructure, attempts can be made to introduce some low-energy water snow-making systems, which can significantly reduce resource waste and thus improve the green level of ice and snow infrastructure. In addition, we can also try to introduce biodegradable antifreeze agents and natural cold source technology into the development of ice and snow infrastructure. This can realize the carbon footprint tracking of ice and snow infrastructure and ensure the rationality and scientificity of the construction of ice and snow infrastructure<sup>[9]</sup>. In some ecologically sensitive areas, the method of building area replacement can be used to carry out work. While constructing ice and snow venues, some ecological restoration projects can be carried out to provide certain recovery resources for the ecosystem. Moreover, we can also try to establish a regional water resource quota trading mechanism, adjust water demand through market-oriented means, integrate green technology into spatial territorial planning, formulate red lines for ecological protection, ensure the rational layout of the ice and snow industry, and make the environmental carrying capacity compatible with ice and snow sports.



### **3.3. Improving the standardization of the safety assurance system**

To further enhance the development effectiveness of ice and snow infrastructure, we should attach importance to the construction of a safety assurance system, formulate a more reasonable and scientific equipment safety plan, ensure that personnel allocation meets relevant national requirements, and establish a safety certification system based on venues of different levels. In addition, we need to actively promote intelligent protection systems and use technologies such as the Internet of Things (IoT) and big data to monitor the ice quality of ice and snow venues, personnel conditions, equipment status, etc., to promptly address potential risks<sup>[10]</sup>. In practice, a higher-quality rescue team should be introduced to ensure that more professional rescue forces fully cover ice and snow venues. This can significantly improve the safety of ice and snow sports and lay a solid foundation for the development of various ice and snow sports in the future. Different ice and snow venues can also develop specific insurance mechanisms based on their sports programs, and improve the level of sports safety and the risk resistance capacity of the venues through cooperation with insurance companies<sup>[11]</sup>. For employees working in ice and snow infrastructure, timely safety training and drills should be provided to greatly enhance their safety awareness and risk response capabilities.

### **3.4. Cultivating interdisciplinary talents and developing an innovative education system**

Against the backdrop of the Beijing Winter Olympics, ice and snow sports in China have achieved long-term development, and the demand for various types of related talents has increased significantly. This requires us to cultivate more interdisciplinary talents and further optimize the talent cultivation and innovation system<sup>[12]</sup>. To this end, schools can offer more disciplines related to ice and snow sports and ice and snow facility management, and achieve a more in-depth integration of disciplinary knowledge with ice and snow sports, which can greatly improve the effectiveness of talent cultivation. Vocational colleges can establish majors related to ice and snow sports and develop a certain hierarchical certification system, and inject more talent into ice and snow sports through school-enterprise cooperation<sup>[13]</sup>. For basic education, more activities like “Ice and Snow Sports Entering Campus” can be carried out. By means of AI technology, Internet technology, etc., students can be taught about the history, types, and culture of ice and snow sports, breaking the constraints of region and season, and enabling students to gain a deeper understanding of ice and snow sports<sup>[14]</sup>. In addition, retired ice and snow athletes can transition into teachers in schools, which allows them to better play their roles and cultivate more talent for ice and snow sports.

### **3.5. Establish a multi-dimensional ice and snow culture dissemination network**

To further enhance the development level of ice and snow technical infrastructure, we should strive to promote the dissemination of ice and snow culture, which also serves as the foundation and prerequisite for encouraging more people to participate in ice and snow sports. With the continuous advancement of China’s Internet technology, we can leverage virtual reality (VR) technology to support the dissemination of ice and snow culture, creating high-quality experiential scenarios. This approach can significantly boost people’s acceptance of ice and snow sports and lower the cognitive threshold for participation<sup>[15]</sup>. Ice and snow venues can collaborate with schools to organize winter camps for students, helping them gain a deeper understanding of ice and snow culture and enhance their awareness of ice and snow sports.

## **4. Conclusion**

In summary, against the backdrop of the Beijing Winter Olympics, to further improve the development

effectiveness of ice and snow infrastructure, we can analyze and implement measures from the following aspects: establishing a full-cycle sustainable development mechanism; advancing the parallel implementation of green technology innovation and ecological compensation; improving the standardized construction of safety guarantee systems; fostering interdisciplinary talents and innovating education systems; and establishing a multi-dimensional ice and snow culture dissemination network. These efforts will implicitly drive further improvements in the development quality of ice and snow infrastructure.

## Disclosure statement

The author declares no conflict of interest.

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# Exploration on the Reform of Practical Teaching in the Course of Traditional Chinese Veterinary Medicine in Colleges and Universities

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**Abstract:** As an important part of the traditional Chinese medicine of the Chinese nation, Traditional Chinese Veterinary Medicine (TCVM) has a development history of thousands of years and has accumulated rich theoretical and practical experience in the prevention and treatment of animal diseases, animal health care, and other aspects. This paper conducts an in-depth discussion on the practical teaching of the TCVM course in colleges and universities, and analyzes the existing problems in current teaching, such as outdated practical content, a single teaching method, and an imperfect assessment and evaluation system. By introducing diversified teaching models such as case teaching, simulated diagnosis and treatment, and school-enterprise cooperation, and optimizing practical teaching content and assessment mechanisms, this paper aims to improve students' practical operation ability and clinical thinking level, promote the organic integration of traditional TCVM theories and modern veterinary clinical practice, and provide teaching reform ideas and practical references for cultivating high-quality TCVM professionals who meet the needs of the new era.

**Keywords:** Colleges and universities; Traditional Chinese veterinary medicine course; Practical teaching; Teaching reform; Talent cultivation

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## 1. Introduction

In recent years, with the increasing emphasis on green breeding and animal welfare, as well as the recognition of traditional medical culture, Traditional Chinese Veterinary Medicine (TCVM) has shown great application potential and development prospects in the modern animal husbandry and veterinary industry due to its unique theoretical system, advantages of natural medicines, and the thinking mode of holistic view and syndrome differentiation and treatment. However, the current teaching of TCVM courses in colleges and universities has problems such as the disconnection between theory and practice and the imperfection of the practical teaching system, resulting in insufficient practical ability of students, which makes it difficult for them to meet the industry's demand for professionals<sup>[1]</sup>. Therefore, carrying out the reform of practical teaching in college TCVM

courses and constructing a scientific and reasonable practical teaching system are of great significance for inheriting and innovating TCVM culture, cultivating TCVM professionals with a solid theoretical foundation and strong practical ability, and promoting the modernization development of the TCVM industry.

## **2. Current situation and problems of practical teaching in veterinary courses in colleges and universities**

### **2.1. Outdated practical teaching content, disconnected from industry needs**

At present, the teaching of Chinese veterinary medicine in colleges and universities mainly focuses on traditional theoretical verification experiments, such as the verification of Chinese veterinary prescription compatibility and the demonstration of traditional Chinese medicine processing methods. Although these operational experiments are conducive to students' mastery of basic theories, they are far from meeting the needs of modern animal husbandry for Chinese veterinary diagnosis and treatment of difficult and diverse symptoms, as well as the increasing emphasis on green and environmental protection treatment and the regulation of animal sub-health<sup>[2]</sup>. However, colleges and universities have not timely integrated the innovative applications of Chinese veterinary medicine in modern agriculture into teaching content, such as the use of traditional Chinese medicine in non-pharmaceutical production and breeding, the application of acupuncture in animal sports injury recovery. As a result, students' knowledge and skills cannot be well applied to practical work<sup>[3]</sup>.

### **2.2. Single teaching method, low students' enthusiasm for practice**

The traditional teaching form of Chinese veterinary medicine is single, usually featuring teacher demonstration and student imitation, lacking interactivity and interest. In the teaching process of drug identification, teachers generally let students observe the shape and properties of drugs and explain their efficacy, while students only passively accept knowledge without opportunities for independent exploration and personal experience. This boring and one-way teaching method is difficult to arouse students' learning enthusiasm, making students feel tedious in practice, hard to master and flexibly apply Chinese veterinary medicine knowledge, thus affecting the effect of experimental teaching.

### **2.3. Insufficient practical teaching resources and limited training conditions**

Improving the quality and effect of Chinese veterinary academic education requires sufficient educational resources, such as traditional Chinese medicine samples, acupuncture tools and diagnostic instruments. However, due to funding constraints, some schools have limited and outdated traditional Chinese medicine samples, and acupuncture instruments are also scarce, which cannot meet students' experimental needs. In addition, the school's laboratory equipment is not perfect, failing to provide a sufficient simulated diagnosis and treatment environment, making it difficult for students to complete diagnosis and treatment work in a real atmosphere. Furthermore, these schools have not established close connections with off-campus internship bases, and the internships are not systematically and targetedly designed. As a result, most students only watch instead of personally participating, which affects the improvement of their practical skills<sup>[4-6]</sup>.

### **2.4. Imperfect assessment and evaluation system, failing to fully reflect students' practical abilities**

At present, the assessment of Chinese veterinary training mainly relies on experimental reports and practical skill



tests, emphasizing students' mastery of theoretical knowledge and the standardization of operating procedures, while ignoring their clinical thinking ability and innovative ability<sup>[7]</sup>. In the practical skill test, students get corresponding scores after operating according to the prescribed procedures. They are not required to analyze or evaluate the problems encountered in the operation process and possible solutions, which cannot fully and objectively reflect their training level and comprehensive quality. This is not conducive to the improvement of students' practical skills and teaching quality.

### **3. Strategies for the reform of practical teaching in veterinary Chinese medicine courses in colleges and universities**

#### **3.1. Optimizing practical teaching content to keep up with industry development needs**

Nowadays, veterinary Chinese medicine is rapidly developing towards green and intelligent directions, and the traditional content of veterinary Chinese medicine courses has long been unable to meet the practical needs of the times. Colleges and universities need to reform the teaching methods of veterinary Chinese medicine courses on the basis of inheriting the culture of traditional Chinese medicine (TCM), so as to meet the requirements of serving the development of real industries and promote the application of veterinary Chinese medicine in modern production<sup>[8]</sup>.

Firstly, it is necessary to fully grasp the current development trend of the animal husbandry industry, which has shifted from prioritizing experience accumulation in the past to prioritizing technological development now. In addition to imparting conventional knowledge in veterinary Chinese medicine courses, it is also necessary to rebuild a new teaching content system for veterinary Chinese medicine courses. For example, the “integration of production, education, research and application” teaching method should be applied in the teaching of Chinese herbal medicines in TCM. Taking the research on drugs for treating classical swine fever as an example, students should not only complete the TCM technical operation of formulating appropriate drugs based on basic TCM theories, but also use advanced HPLC and GC-MS chromatographic detection equipment to determine the quantitative analysis of active ingredients in the raw materials of Chinese medicines.

Secondly, a case database of veterinary Chinese medicine knowledge should be established, covering large-scale farm epidemics, pet hospital difficulties, etc.<sup>[9-11]</sup> Multiple teaching methods can be used in the diagnosis and treatment of dairy cow mastitis: infrared thermal imaging can be used to analyze and display the thermal distribution in mastitis-inflamed areas, and a tongue image analyzer can be used to collect information on tongue color and coating. The etiology can be identified based on data collected through different diagnostic methods. This helps to strengthen students' diagnostic and treatment thinking that integrates veterinary Chinese medicine and improves their ability to handle clinically difficult problems. In the teaching of animal health protection and environmentally friendly breeding, the “one livestock, one strategy” plan can also be adopted. For laying poultry, based on the TCM theories of “kidney governing reproduction” and “spleen governing transportation and transformation”, a comprehensive health care and treatment plan can be implemented, combining TCM prescriptions with sunlight conditioning and administration of probiotics. At the same time, green breeding methods should be promoted, such as animal welfare breeding and the development of non-pharmaceutical technologies. For instance, moxibustion at the Baihui acupoint can be used during beef cattle breeding to enhance gastrointestinal peristalsis; massage can be applied to promote digestion in beef cattle and alleviate fatigue from long-distance transportation, thereby achieving the goal of antibiotic-free breeding and helping students become practitioners of modern green breeding technologies.

### **3.2. Innovating teaching methods to stimulate students' learning interest**

A single educational model cannot meet students' knowledge needs. It is necessary to reform and innovate the teaching methods of traditional Chinese veterinary medicine technology and skills training, and use flexible and diverse teaching methods to build an interactive and dynamic classroom learning environment. This enables students not only to understand the basic theories and skills of traditional Chinese veterinary medicine, but also to develop their thinking and abilities in independent learning, research, and exploration, thereby improving their clinical skills.

First, establish a “three-level progressive case teaching” approach: basic case learning to consolidate fundamental knowledge, complex case learning to reinforce basic skills, and forward-looking case learning to broaden horizons. At the basic stage, common cases such as canine wind-heat cold can be used for teaching, allowing students to master the basic diagnosis and treatment steps of “observation, auscultation & olfaction, inquiry, pulse-taking & palpation – syndrome differentiation – prescription selection and medication”. At the complex case stage, complicated cases, such as equine acute abdominal syndrome, are added to guide students to identify different types of cases. A team discussion model is adopted to help students learn and understand the causes and mechanisms of different diseases. Forward-looking cases focus on TCM health preservation for animals, such as the treatment of canine hip dysplasia with acupuncture combined with rehabilitation training, to stimulate students' deeper interest and research motivation in the course.

Second, advanced case simulation diagnosis and treatment teaching towards intelligence and immersion. Through the establishment of a real-time update mechanism for case databases, clinical cases provided by front-line units such as enterprises and animal hospitals are continuously incorporated to ensure the timeliness and advancement of teaching cases. With virtual reality medical systems, students can enter scenes of virtual breeding houses or pet hospitals through head-mounted devices, and use fingertip recognition technology to complete medical consultations and acupuncture treatments for animals and plants. For example, when piglets have diarrhea in a virtual pig farm, students can determine prevention and control plans through virtual sampling, laboratory testing, and diagnostic analysis. The system records students' operations and generates skill reports, which help teachers accurately identify students' knowledge weaknesses. In addition, the online-offline blended teaching method should also build an “OMO” (Online-Merge-Offline) ecological environment. Online services include a 3D traditional Chinese veterinary medicine sample database, VR videos of acupuncture points, and digital textbooks of classic traditional Chinese veterinary medicine. Students can access and view learning resources such as the microscopic structure of medicines and meridian operation through their mobile phones at any time. On campus, “question chain” teaching is adopted in classrooms. For example, when teaching “TCM prevention and treatment of animal stress syndrome”, teachers can set progressive questions such as “What are the TCM etiologies of stress?” and “How to conduct synergistic intervention through traditional Chinese medicine and acupuncture?” to guide students to search online resources in groups, carry out experimental research, and finally present their learning results through offline reports, to achieve the goal of acquiring knowledge and improving abilities<sup>[12]</sup>.

### **3.3. Strengthen the construction of practical teaching resources and improve practical training conditions**

Practical educational resources are the guarantee of teaching quality. To address the predicament of outdated on-campus facilities and short-term off-campus internships, it is necessary to vigorously integrate resources and pursue technological innovation, and build a practical learning platform with a linkage between on-campus and

off-campus, to provide students with a high-level practical teaching environment and consolidate practical skills training. Specifically, on-campus laboratories follow the principle of “functional differentiation and functional integration”. The Chinese Medicine Specimen Museum is built as a “one museum, three zones and one platform”: the specimen exhibition area displays dried specimens and soaked specimens; the digital interaction area is equipped with a panoramic projector, which can fully present the morphology and efficacy of medicinal materials; the rare medicinal materials replacement research area explores artificial breeding methods for animal medicinal materials; and the specimen database platform realizes intelligent specimen retrieval and enhanced display functions. The acupuncture teaching laboratory has introduced a simulated acupuncture system, which uses force sensors to reflect the intensity of acupuncture manipulation and myoelectric signal sensors to sense the strength of acupoint stimulation. Students can repeatedly practice needle withdrawal, reinforcing twirling, reducing twirling, reinforcing lifting and thrusting, reducing lifting and thrusting, etc., on virtual animal models, and the computer will automatically give scores and improvement suggestions. The clinical training room is equipped with 5G telemedicine equipment, which can contact cooperative farms, pet hospitals, etc., in the first place, to carry out remote diagnosis teaching and integrate students into clinical conditions. The “dual-tutor system + project internship” means that school teachers and company experts implement a dual-tutor system for off-campus internship bases. When students intern in companies, school teachers and company experts provide special teaching assistance to students to complete designated tasks, forming a joint force<sup>[13]</sup>. A set of internship quality monitoring measures based on online submission of internship diaries, phased teacher evaluations and internship result displays shall be established to ensure the quality of internships.

### **3.4. Improve the assessment and evaluation system to comprehensively evaluate students' practical abilities**

Scientific assessment and evaluation an important means to test teaching outcomes. Higher vocational colleges should establish a diverse assessment system and adopt industry-recognized standards to more comprehensively and objectively evaluate students' professional competence, so as to more effectively guide their career development<sup>[14]</sup>.

First, school teachers should design a “three-dimensional and five-link” assessment system. The three dimensions refer to: the basic dimension (understanding of Traditional Chinese Veterinary Medicine), the ability dimension (practical skills and clinical thinking ability), and the character dimension (professional ethics and team spirit); the five links mean: 20% for classroom learning, 20% for laboratory assignments, 25% for simulated diagnosis and treatment, 25% for internship operation, and the remaining 10% for technological innovation. Scores for classroom learning will use online classroom platforms to monitor students' participation; laboratory assignments will be subject to anonymous random checks, with grading jointly conducted by school and enterprise teachers; standardized patient (SP) technology will be applied, where trained personnel simulate animal owners to evaluate students on multiple indicators such as communication skills and accuracy in diagnosis and treatment locations; blockchain technology will be used in internship assessment to ensure its immutability; technological innovation will be evaluated based on students' applications for entrepreneurship patents, publication of papers, participation in competitions, etc.

In addition, industry standards can be introduced to design a set of standards for recognizing the level of practical ability in Traditional Chinese Veterinary Medicine. Based on the national vocational certification National Vocational Skill Standard - Animal Disease Prevention and Control Worker and combined with the characteristics of Traditional Chinese Veterinary Medicine, three-level evaluation indicators are proposed:

primary (basic operations), intermediate (clinical diagnosis), and advanced (technological innovation). The evaluation includes practical operation assessments of TCM (Traditional Chinese Medicine) identification, acupuncture techniques, and clinical case discussions. After achieving these goals, students will obtain industry-recognized qualification certificates<sup>[15]</sup>. Furthermore, the evaluation results should be fed back to students, and personalized study suggestions should be given based on their shortcomings. For example, if students' practical operations are not up to standard, corresponding video tutorials should be provided; if students lack clinical thinking ability, they should learn to analyze a database of typical cases. In this way, the assessment can give full play to its advantages, not only guiding the direction of student training but also improving students' abilities, thus laying a solid foundation for their future employment.

## 4. Conclusion

In summary, the reform of practical teaching for TCVM courses in colleges is a key link in cultivating high-quality TCVM professionals. Through reform measures such as optimizing practical teaching content, innovating teaching methods, strengthening the construction of practical teaching resources, and improving the assessment and evaluation system, the quality of TCVM practical teaching can be effectively improved. These measures help cultivate students' practical operation abilities and clinical thinking levels, and promote the integration and innovation of traditional TCVM theories and modern veterinary clinical practice.

## Disclosure statement

The author declares no conflict of interest.

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# Research on Constructing a “Four-Dimensional Collaboration” Education Mechanism for College Students’ Ideals and Beliefs in the New Era

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**Abstract:** Against the backdrop of the new era, the education of college students’ ideals and beliefs is crucial to their growth and the realization of the goal of “fostering virtue through education.” Regularization emphasizes the daily and sustainable nature of education, while institutionalization is mainly reflected in regularity and standardization. Although they focus on different aspects, they complement each other. To construct an education mechanism for college students’ ideals and beliefs, it is necessary to follow the basic educational principles such as institutionalization and standardization, innovation, and inheritance. In the practice of education, a “four-dimensional collaboration” model can be built, which includes the collaboration of educational subjects, resources, models, and environments, to accelerate the regularization of college students’ ideal and belief education. Starting from the perspective of the education mechanism for college students’ ideals and beliefs, this paper analyzes the principles to be followed in education under the background of “four-dimensional collaboration,” and puts forward specific strategies for the construction of the education mechanism, aiming to help college students strengthen their ideals and beliefs and accumulate experience for subsequent teaching practice.

**Keywords:** New era; College students; Ideal and belief education

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## 1. Introduction

Ideals and beliefs play an important role in nurturing and supporting the struggle of a nation, and serve as a valuable spiritual nourishment. In the process of social development, college students play a vital role, and whether they have firm ideals and beliefs is related to the effectiveness of building a powerful modern socialist country. In the context of the new era, colleges and universities need to clarify the significance of college students’ ideal and belief education, correctly view the existing problems in education, such as being superficial and lacking effectiveness, explore scientific ways of ideal and belief education, and carry out scientific guidance to help college students understand the laws of historical development. Through the implementation of ideal and belief education, students can strengthen their own beliefs, actively participate in future study and life, and grow

into aspiring young people who meet the needs of society.

## **2. Principles to be followed in constructing the “Four-Dimensional Collaboration” education mechanism for college students’ ideals and beliefs in the new era**

### **2.1. Emphasize the unity of inheritance and innovation**

In the ideal and belief education in colleges and universities, inheritance and innovation are fine traditions. From the perspective of teaching methods, approaches such as theoretical teaching and education through the environment are still adopted <sup>[1]</sup>. In response to the challenges and problems faced in the current era, to promote the implementation of ideal and belief education, it is necessary to implement the concept of innovation, take the thought of socialism with Chinese characteristics as the teaching guideline, adjust the traditional ideal and belief education, and explore an education model that meets the needs of college students in combination with practical situations <sup>[2]</sup>. In addition, to realize the regularization and institutionalization of college students’ ideal and belief education, it is essential to attach importance to practical activities to test the final results. However, the development and changes of practice determine that ideal and belief education is not static, but an activity of inheriting successful experience and developing innovation.

### **2.2. Implement the unity of institutionalization and standardization**

Against the backdrop of the new era, the implementation of college students’ ideals and beliefs in education needs to be constrained by systems, which can standardize college students’ behavioral rules and play a good guiding role <sup>[3]</sup>. At the same time, institutionalized means can be used to standardize the content and form of ideal and belief education, helping colleges and universities to carry out ideal and belief education better and highlight its characteristics of standardization and efficiency. Based on this, in the implementation of ideal and belief education, colleges and universities should attach importance to the construction of relevant systems, standardize the education subjects, follow the education procedures, and implement the principle of unifying institutionalization and standardization to effectively improve the teaching quality.

### **2.3. Promote the unity of practice and life**

According to the connotation of regularization, it is usually related to students’ daily life and gradually becomes familiar and recognized by them; that is, regular things are closely connected with daily life <sup>[4]</sup>. In the process of college students’ ideal and belief education, colleges and universities should strengthen the connection with college students’ practice, deeply explore the life-oriented resources contained in belief education, and actively carry out practices to promote the realization of ideal and belief education <sup>[5]</sup>. To give play to the role of students’ good values, it is necessary to integrate them into social life, encourage them to actively participate in practical activities, and deepen their perception of values. Based on this, to effectively improve the quality of education and promote the formation of positive values among college students, it is necessary to attach importance to the life-oriented nature of ideal and belief education and encourage active participation in practical methods to help them establish ideals and develop firm beliefs.

### **2.4. Realize the unity of systematization and collaboration**

In the face of college students’ ideal and belief education, it is necessary to integrate forces from all parties to build a systematic and collaborative education system. Based on system theory and synergy theory, to advance

various elements within the system, it is necessary to focus on improving the overall efficiency, thereby effectively enhancing the educational effect. Among them, ideal and belief education activities are inseparable from the joint action of subsystems and various elements; if the elements are separated from each other, it will be difficult to effectively exert the overall efficiency<sup>[6]</sup>. At the same time, the implementation of college students' ideal and belief education often involves various aspects of education, such as teachers, students, and various departments, and it also attaches importance to the interactive communication among subjects such as society, family, and students.

### **3. Practical strategies for constructing the “Four-Dimensional Collaboration” education mechanism for college students’ ideals and beliefs in the new era**

#### **3.1. Carry out collaborative education activities between counselors and ideological and political teachers**

First, attach importance to giving play to the role of counselors. From the perspective of counselors, on the one hand, they can use their theoretical literacy to answer questions encountered by students, restrict their own words and deeds, influence and inspire students, and lay a foundation for the smooth development of college students' ideal and belief education. On the other hand, they need to attach importance to ideological and political education activities, understand students' ideological status, and provide appropriate guidance and help<sup>[7]</sup>.

Second, highlight the educational value of ideological and political education. In the process of ideal and belief education, ideological and political teachers need to pay attention to teaching practice, constantly exert their own role, provide good guidance, enable students to clearly understand the future development of our country, and actively conduct positive guidance to help students establish ideals and beliefs. At the same time, teachers should pay attention to teaching practice activities, actively try diversified methods to enhance students' enthusiasm for knowledge learning, and cultivate their optimistic attitude and firm beliefs<sup>[8]</sup>. By carrying out collaborative education activities between counselors and ideological and political education, colleges and universities can promote the regularization of ideal and belief education, effectively perform their duties and tasks, carry out good collaborative education work, improve the effect of organizational leadership, effectively establish reasonable systems, synthesize college students' behavioral performance, and thus carry out accurate and effective teaching work.

#### **3.2. Attach importance to the construction of an environmentally collaborative education mechanism**

Colleges and universities can carry out the construction of a campus cultural environment to effectively promote the regularization of ideological and belief education. A good campus environment can facilitate the implementation of ideal and belief education, optimize the educational atmosphere, provide diversified platforms, and foster a positive class atmosphere and academic atmosphere, thus laying a spiritual foundation for students to establish firm ideals and beliefs<sup>[9]</sup>. On the one hand, carry out campus cultural activities to improve cultural standards. Colleges and universities should emphasize the diversification of cultural activities, highlight the hierarchy and charm of these activities, and achieve education through recreation. For the theoretical knowledge courses of ideal and belief education, students' leading role can be brought into play to design activity forms, enrich college students' after-school life, enhance their cultural identity, and achieve good educational results<sup>[10]</sup>. On the other hand, pay attention to the standardization of campus institutional culture. The construction of a high-level cultural system can form

strong cohesion and appeal. For example, school mottoes and school songs, colleges and universities can make good use of the construction of campus institutional culture to effectively improve the internal atmosphere and external image of the cultural environment. This plays a role as a spiritual sustenance, enabling students to pursue truth and innovation, and imperceptibly carry out ideal and belief education.

In addition, it effectively improves the online education environment. Colleges and universities need to improve online media to promote the regularization of college students' ideal and belief education, carry out positive publicity through the internet, and create a positive and uplifting online education atmosphere. First, ensure the teaching orientation and carry out educational practice activities. Attach importance to improving the campus online education environment, adhere to the correct political and public opinion orientation, and implement the concept of innovation, so as to carry out publicity, explanation, and interpretation from multiple perspectives. Colleges and universities can set up special columns for ideological and belief education, and carry out online publicity activities with the content of traditional culture and socialism with Chinese characteristics to create a high-quality learning environment for students. At the same time, colleges and universities can excavate materials about teachers and students, and use the deeds of role models to influence students, thus effectively improving the educational effect.

Second, attach importance to the implementation of management and supervision. Colleges and universities need to have a good understanding of on-campus websites, social groups, etc., carry out dynamic management, and attach importance to the improvement of information review and detection mechanisms to create a good online education environment<sup>[11]</sup>.

Third, attach importance to the innovation of publicity methods to make the publicity content more attractive and appealing. Colleges and universities can carry out in-depth excavation work, grasp their own historical and cultural resources, and use the interactivity of online media to promote the integration of various media, such as text and images, to vividly present content to students and build a good platform for ideal and belief education<sup>[12]</sup>. In addition, colleges and universities can innovate the campus online discourse system, provide students with new media platforms with warmth and connotation, so that students can have a better experience, effectively enhance their right to speak online, enable students to achieve better expected results, and smoothly carry out regular ideological and belief education.

### **3.3. Construct an integrated education mechanism**

To improve the quality of college students' ideal and belief education, colleges and universities should attach importance to the construction of an integrated education mechanism to make education more precise. In the process of ideal and belief education, ideological and political teachers and counselors, as direct participants, can improve their daily work, understand students' knowledge learning status, conduct good communication, clearly recognize the characteristics of college student groups, and effectively grasp their growth needs. This enables students to actively participate in the study of ideals and beliefs and develop strong enthusiasm for social practice activities, truly realizing the all-round coverage of education<sup>[13]</sup>. At the same time, in the face of problems arising in ideal and belief education, teachers need to implement the principle of "teaching students in accordance with their aptitude", adopt reasonable measures, intuitively understand the individual differences in students' growth, and carry out good personalized education to help students break through ideological confusion.

### **3.4. Promote teaching innovation and improve the educational management mechanism**

In college students' ideal and belief education, colleges and universities should attach importance to the



adjustment of educational systems, teaching training, and teaching forms. Based on this, the construction of an efficient educational management mechanism can not only meet the needs of the times but also give play to the advantages of information technology, innovate teaching methods, and effectively improve teaching quality<sup>[14]</sup>.

First, attach importance to the complementarity between the value of ideal and belief education and the characteristics of online platforms. Colleges and universities can use new media platforms and technical means such as big data and artificial intelligence to intuitively present the content of ideal and belief education and improve students' comprehensive quality. The implementation of the above teaching practices can not only enhance the depth of teaching content but also increase its appeal, create a pleasant atmosphere for students, and expose them to the edification of ideals and beliefs.

Second, construct a new media network pattern including WeChat official accounts and video accounts, and give full play to the role of online education platforms to carry out all-around education activities. Educational platforms can adjust their educational content and styles according to their own characteristics. For example, video accounts can release short videos to showcase advanced deeds and heroic figures, while WeChat official accounts can facilitate students' study of theoretical policies, enrich learning materials, and carry out effective exchanges and interactions. The improvement of educational platforms can enhance teaching effects and achieve full coverage of ideal and belief education<sup>[15]</sup>.

Third, actively innovate teaching content to meet students' actual needs. From the perspective of content creation, teachers need to understand students' situations, select languages and forms that are easy for them to accept, and adjust teaching practices. At the same time, they can invite professional scholars, alumni, etc., to actively carry out online lectures and communications, to enhance students' enthusiasm for participation and encourage them to express their own ideas. In practical, ideal, and belief education, it is necessary to enhance the novelty of content, answer students' questions promptly, help them effectively solve related problems, and make educational and teaching activities more targeted.

## 4. Conclusion

In summary, to implement the fundamental task of fostering virtue through education, colleges and universities need to adjust the ideal and belief education for college students and enhance their participation in courses. The construction of a "Four-Dimensional Collaboration" education mechanism can effectively improve the effectiveness of college students' ideal and belief education and provide support for students' all-around development. In teaching practice, colleges and universities should attach importance to deepening teaching reforms and continuously innovate teaching methods to meet the needs of ideological and belief education in the new era. Close communication with all sectors of society can provide support for the implementation of ideal and belief education and meet the educational needs of colleges and universities.

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## Disclosure statement

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# Research on the Physical Health Status and Promotion Strategies of Middle School Students in A City in Shandong Province

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**Abstract:** This article uses research methods such as literature review, questionnaire survey, interview, and mathematical statistics to investigate and analyze the physical health status of junior high school students in a city area of Shandong Province. The research results indicate that factors affecting the physical health of middle school students include irregular lifestyle habits, insufficient rest and exercise time, high academic pressure, a family environment not valuing physical exercise, and inadequate school sports equipment and facilities. In response to these influencing factors, strategies are proposed to develop personalized physical education teaching to cultivate students' interest in sports, adopt a reasonable layered teaching model, strengthen and improve the construction of school sports equipment and facilities, promote the improvement of students' physical health through the linkage between schools and families, and create a strong campus sports and exercise atmosphere through multiple measures, aiming to improve the physical health level and promote the physical health development of middle school students.

**Keywords:** Middle school students; Physical health; Present situation; Promotion strategy

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## 1. Introduction

The national physical fitness level is the core resource for the future development of a country, especially the physical health of young people, which is the foundation guarantee for the vigorous vitality of the nation. The strong physical fitness and willpower of young people are also a reflection of the improvement of social and demographic quality to a certain extent. The physical health of primary and secondary school students is not only related to their individual development, but also to the overall effectiveness of school sports work. The physical education work in schools has always been strictly arranged and practiced around the core requirement of improving students' physical health level<sup>[1]</sup>. Currently, middle school students generally suffer from problems such as insufficient exercise, increasing obesity rates, and declining physical fitness, and their physical health

status is not optimistic. So, changing the concept of physical education for middle school students and paying attention to their physical and mental health has become an important direction of physical education. In this social context, it is necessary for us to comprehensively understand the actual situation of the physical health of middle school students, analyze the main factors affecting their physical health, explore effective strategies and methods to improve their physical health level, and make positive contributions to promoting their healthy development and social progress.

## **2. Research objects and methods**

### **2.1. Research object**

The study focuses on the physical health status and promotion strategies of junior high school students in a city area of Shandong Province.

### **2.2. Research methods**

#### **2.2.1. Literature review method**

By conducting a comprehensive review of a large number of journal articles in data resource databases such as China National Knowledge Infrastructure, and according to the needs of the research project, the literature was sorted and summarized to provide sufficient theoretical support for this article. In addition, relevant sports policy documents and annual reports on school sports work were consulted to comprehensively grasp the research status and policy direction.

#### **2.2.2. Questionnaire survey method**

According to the research needs, a total of 220 questionnaires were distributed to students in the urban area of a certain city based on their actual situation. 200 questionnaires were actually collected, with 200 valid questionnaires and an effective response rate of 87.00%. 100 questionnaires were distributed to parents of students, and 100 were collected, with an effective response rate of 100%.

#### **2.2.3. Interview method**

According to the needs of the research content, we visited some teachers and students from a middle school in the urban area of a certain city, and gained a clear understanding of the current situation of students' participation in physical exercise. Interview samples are extracted from teachers based on dimensions such as grade level. Extract students based on grade, gender, physical education performance, etc., to ensure that the sample is representative.

#### **2.2.4. Mathematical and statistical methods**

This study conducted statistical tests on the collected data using Excel spreadsheets to ensure the quality and usability of the data. Finally, conclusions were drawn based on the results of mathematical statistics.

## **3. Research results and analysis**

### **3.1. Analysis of the physical health status of middle school students in a certain city's urban area**

In 2024, a total of 1200 students were sampled for physical fitness testing in the first, second, and third year of junior high school in a city area of Shandong Province, including 713 boys and 487 girls (**Table 1**).

**Table 1.** Statistics of sample size of junior high school students in a certain city's urban area

Grade	Gender	Number
One year of junior middle school	Boy student	236
	Girl student	164
The second year of junior middle school	Boy student	241
	Girl student	157
The third year of junior middle school	Boy student	236
	Girl student	166

### 3.1.1. Current physical condition

#### 3.1.1.1. Analysis of height and weight physical test results

**Table 2.** Statistics of height and weight status of middle school students in urban areas of a certain city ( $n = 1200$ )

Grade	Gender	Height (cm)	Weight (kg)
One year of junior middle school	Boy student	$153.0 \pm 8.5$	$53.18 \pm 13.50$
	Girl student	$155.0 \pm 5.2$	$49.52 \pm 10.52$
The second year of junior middle school	Boy student	$166.0 \pm 7.7$	$71.61 \pm 13.70$
	Girl student	$163.0 \pm 5.1$	$52.12 \pm 10.32$
The third Year of junior middle school	Boy student	$170.0 \pm 6.3$	$75.37 \pm 10.88$
	Girl student	$165.0 \pm 4.4$	$55.32 \pm 12.37$

From **Table 2**, it can be seen that the height data of students in grades one to three show a gradual increase. The height of students in grade one is significantly lower than that of students in grade three, and the difference is quite significant. The weight data of the three grades in junior high school show a step-like growth pattern. After entering grade two, the weight of male students in grade one increases significantly, with an increase of 18.42 kilograms, while the height growth value of male students in the corresponding period is 13 centimeters.

#### 3.1.1.2. Proportion of BMI index among middle school students in urban areas of a certain city

BMI value, also known as body mass index, is an internationally recognized benchmark for measuring body shape and weight, and is also one of the common criteria for judging health level.  $BMI = \text{weight}/\text{height}^2$ . According to the national standard for physical health testing requirements, the normal weight distribution of first-year male students is in the range of 15.5–22.1, and a BMI value  $\leq 15.4$  belongs to the category of light weight. If the BMI falls in the range of 22.2–24.9, it is judged as overweight, and 25 is the BMI threshold for obesity. In the second stage of junior high school, the normal BMI value for male students is within the range of 15.7–22.5. If the BMI value does not exceed 15.6, it belongs to the category of light weight. If the BMI is  $\geq 22.6$  but does not reach 25.2, it is judged as overweight. If the BMI value exceeds 25.3, it is judged as obesity. The standard weight range for junior high school boys is 15.8 to 22.8, with a BMI value not exceeding 15.7 belonging to the category of light weight. A BMI value between 22.9–26.0 is considered overweight, while a BMI value exceeding 26.1 is defined as obesity. According to medical standards, the normal weight range for girls in their first year of junior high school is 14.8–21.7 BMI values. The critical BMI value for light weight is  $\leq 14.7$ . When

the BMI value is between 21.8 and 24.4, it is considered overweight. If the BMI exceeds 24.5, it is considered obese. The normal BMI threshold for second-grade girls in junior high school is 15.3–22.2. A BMI value  $\leq 15.2$  belongs to the category of light weight, while a BMI value exceeding 22.3 but not reaching 24.8 belongs to overweight. If the BMI value is higher than 24.89, it belongs to the category of obesity. The ideal weight distribution for girls in the third year of junior high school is between 16.0–22.6. Individuals with a BMI  $\leq 15.9$  are classified as underweight. If the BMI value falls within the range of 22.7–25.1, it is considered overweight. If the BMI value exceeds 25.2, it can be diagnosed as obesity <sup>[2]</sup>.

**Table 3.** The current proportion of BMI index among middle school students in urban areas of a certain city ( $n = 1200$ )

Grade	Gender	Low eight	Standard weight	Overweight	Obesity
One year of junior middle school	Boy	7.8%	70.0%	11.3%	10.9%
	Girl	6.6%	72.9%	11.6%	8.9%
The second year of junior middle school	Boy	7.4%	73.8%	9.9%	8.9%
	Girl	6.9%	75.6%	10.5%	7.0%
The third year of junior middle school	Boy	7.1%	76.2%	9.3%	7.4%
	Girl	8.5%	77.4%	7.2%	6.9%

According to **Table 3**, the proportion of BMI index among middle school students in the urban area of a certain city is gradually increasing, indicating that the number of people with standard body weight is increasing year by year; However, the number of students with low weight, overweight, or obesity still accounts for a large proportion, which means that the development ratio of height and weight is not balanced. The proportion of girls with low body weight increases with age, with proportions of 6.6%, 6.9%, and 8.5%, respectively. This indicates that middle school girls generally have an aesthetic tendency to pursue slimness. The proportion of overweight and obesity among males in this middle school is decreasing, accounting for 22.2%, 18.8%, and 16.7% respectively. However, the phenomenon of weight imbalance (underweight/overweight) is still significant, and the height-to-weight ratio is imbalanced, which is not conducive to promoting physical health.

### 3.1.2. Current status of physical fitness compliance rate

Analyze the current status of students' physical fitness (speed, endurance, strength, flexibility) by referring to the physical examination form data of middle schools in a certain city area.

**Table 4.** Physical fitness status of middle school students in a certain city's urban area ( $n = 1200$ )

Test project	Number of people meeting the standard	Compliance rate
50-meter run	905	75.4%
800-meter run	364	74.7%
1000-meter run	518	72.7%
Pull up (male)	418	58.6%
Sit ups (female)	352	72.3%
Sit and reach	936	78.0%



From the data in **Table 4**, it can be seen that the compliance rate for 50 meter running is 75.4%, 800 meter running is 74.7%, 1000 meter running is 72.7%, sit ups (for girls) is 72.3%, and sitting forward bending is the highest (78%), indicating that students perform well in overall physical flexibility; The lowest success rate (58.6%) for pull up (boys) indicates that their upper limb strength may be relatively weak. There are significant differences in the compliance rates of different projects.

### 3.1.3. Analysis of the current status of physical function compliance rate

According to the lung capacity standard for middle school students' physical fitness testing, the minimum reference value for lung capacity for male students in Grade 7 is about 2500 milliliters; The minimum for girls is about 2200 milliliters. The minimum lung capacity for boys in the second year of junior high school is about 2700 milliliters, and for girls it is about 2400 milliliters. The minimum lung capacity for boys in the third year of junior high school is about 2900 milliliters, and for girls it is about 2600 milliliters.

**Table 5.** Statistics of lung capacity compliance rate among middle school students in urban areas of a certain city ( $n = 1200$ )

Indicator	Grade	Gender	Proportion of compliance
Vital capacity	One year of junior middle school	Boy	81.2%
		Girl	77.8%
	The second year of junior middle school	Boy	83%
		Girl	81.5%
	The third year of junior middle school	Boy	88.2%
		Girl	84%

According to **Table 5**, the compliance rate for male students in Grade 1 is 81.2%, while for female students it is 77.8%. The compliance rate for male students in Grade 2 is 83%, while for female students it is 81.5%. The compliance rate for male students in Grade 3 is 88.2%, while for female students it is 84%. The number of students who meet the lung capacity standards in Grade 1, Grade 2, and Grade 3 has shown an increasing trend, with significant differences between males and females.

## 3.2. Analysis of factors affecting the physical health of middle school students in a certain city's urban area

### 3.2.1. The impact of lifestyle habits on physical health

**Table 6.** Current sleep time status of middle school students in urban areas of a certain city ( $n = 200$ )

Sleep duration	Number of people	Proportion
9 hours or more	42	21%
7–8 hours	63	31.5%
Less than 7 hours	95	47.5%

According to relevant national regulations, the “Notice on Further Strengthening Sleep Management for Primary and Secondary School Students” clearly states that middle school students should ensure a sleep time

of 9 hours, aiming to promote their physical and mental health development. According to **Table 6**, only 21% of students are able to maintain sufficient sleep. For middle school students, insufficient sleep can lead to difficulty concentrating, decreased physical fitness, weakened immunity, and susceptibility to various diseases.

**Table 7.** Current situation of dietary habits of middle school students in urban areas of a certain city ( $n = 200$ )

Unhealthy eating frequency	Number of people	Proportion
0–1 time	53	26.50%
2–3 time	85	42.5%
4 times or more	62	31%

According to **Table 7**, 26.5% of students eat junk food 0-1 times a week, 42.5% eat junk food 2-3 times a week, and 31.0% eat junk food 4 times or more per week. Most students do not pay attention to their dietary health and habits, and irregular and unhealthy eating habits can affect physical development and recovery.

### 3.2.2. The impact of physical exercise time on physical health

**Table 8.** Current situation of daily physical exercise time for middle school students in urban areas of a certain city ( $n = 200$ )

Daily participation in physical exercise time	Number of people	Proportion
1 hour or less	54	27.0%
0.5–1 hour	78	39.0%
Less than 0.5 hours	75	34.0%

From **Table 8**, it can be seen that the survey shows that 27.0% of students exercise for less than 1 hour per day, and 39% of students exercise for more than half an hour or less per day. The survey shows that 34% of students exercise for less than half an hour per day, and the majority of students exercise for less than 1 hour per day. Moreover, students' physical exercise mainly relies on physical education classes, which are squeezed into the teaching system, resulting in insufficient physical exercise and reduced student motivation.

### 3.2.3. The impact of family environmental factors on physical health

**Table 9.** Current status of parents' attention to physical exercise among middle school students in a city's urban area ( $n = 100$ )

Parents' attention to physical exercise	Number of people	Proportion
Very concerned	21	21.0%
pay more attention to	33	33.0%
Not paying much attention	46	46.0%

From **Table 9**, it can be seen that 21.0% of parents are very concerned about their children's physical exercise, 33% of parents are relatively concerned about their children's physical exercise, 46% of parents are not

very concerned about their children's physical exercise, and the majority of parents do not attach importance to their children's physical exercise in the family environment. Some parents focus too much on learning and underestimate the concept of sports. In addition, the family sports atmosphere is not strong, and they do not provide sufficient support for their children, which is not conducive to the healthy development of their physical fitness.

**Table 10.** Current status of parents' attention to academic performance and physical exercise of middle school students in urban areas of a certain city ( $n = 100$ )

Parents attach importance to certain aspects	Number of people	Proportion
Academic performance is important	49	49.0%
Physical exercise is important	16	16.0%
Both are equally important	35	35.0%

From **Table 10**, it can be seen that 49% of parents believe that academic performance is important, 16% of parents believe that physical exercise is important, and 35% of parents believe that both are equally important. Parents do not attach enough importance to physical exercise, and their emphasis on learning over physical activity is evident.

**Table 11.** Attitude of parents of middle school students in urban areas of a certain city towards supporting extracurricular physical exercise ( $n = 100$ )

Supporting attitude	Number of people	Proportion
Very supportive	26	26.0%
Relatively supportive	41	41.0%
Never mind	29	29.0%
Not supported	4	4.0%

From **Table 11**, it can be seen that 26% of parents strongly support the school's frequent extracurricular sports activities, 41% of parents are relatively supportive of the school's frequent extracurricular sports activities, 29% of parents have an indifferent attitude towards the school's frequent extracurricular sports activities, and 4% of parents do not support the school's frequent extracurricular sports activities, indicating that 33% of parents do not attach importance to students' participation in extracurricular sports exercises.

### 3.2.4. The impact of weekly participation in extracurricular physical exercise time on physical health

**Table 12.** Survey on the current situation of weekly extracurricular sports exercise time for middle school students in urban areas of a certain city ( $n = 200$ )

Weekly participation in extracurricular exercise time	Number of people	Proportion
3 hours or more	67	33.5%
About 1–2 hours	98	49%
Almost no participation	35	17.5%

According to **Table 12**, 33.5% of students participate in extracurricular exercise for 3 hours or more per week, 49% participate in extracurricular exercise for 1–2 hours per week, and 17.5% hardly participate in extracurricular exercise per week. Students' outdoor activities have decreased and sedentary time has increased, which is not conducive to improving their physical health.

### 3.2.5. The impact of excessive academic pressure on physical health

**Table 13.** Current status of academic pressure sources for middle school students in urban areas of a certain city ( $n = 200$ )

Sources of academic pressure	Number of people	Proportion
Academic examination	62	31.0%
Homework burden	92	46.0%
Extracurricular tutoring classes	46	23.0%

According to **Table 13**, 38.0% of students' academic pressure comes from academic exams, 38.5% comes from homework burden, and 23.5% comes from extracurricular tutoring classes. A large amount of homework and exams occupies students' spare time, leaving them with no time to participate in exercise. Long-term stress can also affect their physical and mental health.

### 3.2.6. The impact of school sports venues, equipment and facilities on physical health

**Table 14.** Survey on the current status of sports equipment in middle schools in urban areas of a certain city ( $n = 200$ )

Adequate sports equipment	Number of people	Proportion
Very sufficient	34	17.0%
Basically sufficient	89	44.5%
Insufficient	77	38.5%

According to **Table 14**, 17% of students reported that sports equipment is very sufficient, 44.5% reported that sports equipment is basically sufficient, and 38.5% reported that sports equipment is insufficient. This indicates that sports equipment and facilities cannot meet the needs of students to engage in sports activities, which is not conducive to improving their physical health.

## 3.3. Strategies for promoting middle school students' physical health in a certain city's urban area

### 3.3.1. Developing personalized physical education teaching to cultivate students' interest in sports

Implement differentiated physical education teaching activities based on students' differences in physical characteristics, physical foundation, interest focus, and sports expertise. Physical education teaching should establish an educational model based on motivation, affirmation, and rewards. In the face of students' skill progress, positive affirmation should be given quickly to cultivate their confidence in physical exercise and

stimulate their initiative to continue participating. Sports games, innovative competition activities, or novel forms of activities can be used to stimulate students' initiative and enthusiasm for participating in classroom physical exercise<sup>[3]</sup>. For students with poor physical fitness, basic physical fitness improvement courses are set up, focusing on training strength, endurance, and flexibility.

### **3.3.2. Reasonable use of the layered teaching mode**

According to students' physical fitness test scores and athletic abilities, they are divided into different levels for teaching. For students with good physical foundation and strong athletic abilities, higher difficulty training content and competition opportunities are provided to help them develop their sports talents; For students with average physical fitness, set moderate intensity teaching goals and training programs to gradually improve their physical level. For students with poor physical fitness, the focus is on carrying out basic physical training, emphasizing the cultivation of their exercise habits and interests. During the teaching period, the stratification is adjusted promptly based on the students' performance to ensure the pertinence and effectiveness of the teaching.

### **3.3.3. Further improve the construction of sports equipment and facilities**

Schools can use various methods to improve and enrich sports facilities, promote students' physical fitness level, plan venues appropriately according to students' age and sports needs, build diversified sports venues such as basketball courts and badminton courts, meet the needs of different sports projects, inspect and maintain existing facilities on time, repair damaged equipment promptly, and ensure safety during use; At the same time, intelligent fitness equipment such as smart skipping rope counting devices will be introduced to stimulate students' enthusiasm for sports. A small sports corner will be built based on the open space at the corner of the campus, adding interesting sports facilities. Cooperation can also be reached with communities and sports venues to increase the space for students to exercise, allowing students to have more opportunities to participate in physical exercise and improve their overall health level.

### **3.3.4. School family linkage promotes students' physical health improvement**

Strengthen communication and cooperation between schools and families, and form a physical education model that links families and schools. The school held a parent symposium as planned to explain the dual benefits of physical exercise on students' physical and psychological health, promote parents' awareness of cultivating their children's exercise habits, set an example, develop regular exercise habits, and create a positive family sports environment for their children. Parents should reasonably allocate their children's after-school time, supervise their children to engage in physical exercise, and maintain close contact with the school to timely understand their children's physical performance in school, jointly promoting their children's physical health development.

### **3.3.5. Multiple measures taken to create a strong campus sports exercise atmosphere**

Schools should increase their promotion of sports culture through various channels such as campus broadcasting, bulletin boards, and school newspapers to publicize the benefits of physical exercise, inspirational anecdotes of sports stars, and to arouse students' enthusiasm for sports. They should set up sports cultural landscapes on campus, such as statues of sports celebrities and sports slogans, to create a strong sports cultural atmosphere. Schools can also encourage teachers to participate in sports activities, highlight the exemplary value of teachers, and drive students to actively engage in sports exercise.



## 4. Conclusion and suggestions

### 4.1. Conclusion

- (1) Uneven development of students' physical fitness, significant changes in body shape, and a significant increase in obesity rates among male students. Insufficient sleep time, unhealthy eating habits, excessive academic pressure, lack of emphasis on sports in the family environment, and lack of sports equipment are not conducive to promoting physical health among students.
- (2) In terms of family environment, parents' emphasis on learning and neglect of physical education, as well as poor family sports atmosphere, are not conducive to the healthy development of children's physical fitness; At the school level, physical education classes are under pressure, with insufficient exercise time, single methods, and insufficient sports equipment, which limits the development of students' physical activities; On an individual level, students lack interest in sports and have poor self-discipline, resulting in insufficient active exercise; Long term sitting, limited extracurricular exercise time, and high academic pressure all hinder the improvement of students' physical health to varying degrees.
- (3) Propose strategies to promote the physical health of middle school students: develop personalized physical education teaching to cultivate students' interest in sports, adopt a reasonable hierarchical teaching mode, further improve the construction of sports equipment and facilities, promote the improvement of students' physical health through school family linkage, and take multiple measures to create a strong campus sports exercise atmosphere.

### 4.2. Suggestions

- (1) Optimize the physical education curriculum and enrich the forms of sports activities. Develop personalized physical education courses based on students' age, gender, and physical fitness differences. Add fun and challenging projects, conduct layered teaching based on students' physical fitness and sports skills, provide opportunities for expansion training and competition for students with strong abilities, and encourage young students to actively take action, step out of the classroom, and step into the sunshine, fully demonstrating the healthy and upward spirit of young people in the new era. <sup>[4]</sup> At the same time, personalized dietary and exercise intervention plans should be developed for students who are overweight, obese, and malnourished. While guiding students to exercise scientifically and reasonably, it is also necessary to guide them to have a healthy diet. For obese individuals, it is recommended to eat as little high-calorie food as possible <sup>[5]</sup>.
- (2) Emphasize physical exercise and create a family sports environment. The progress of students' physical health cannot be achieved without the active participation of their families. The growth process and daily life of students are centered around the family. Parents need to correctly grasp the significance of adolescent physical health, provide sufficient support to their children, create a supportive family environment, encourage children to engage in sports practice, and enhance their physical function <sup>[6]</sup>. Parents should establish a correct educational concept, recognize the importance of physical exercise for children's physical and mental health, and arrange their children's diet and daily life reasonably, establish a reasonable and balanced dietary structure, so that their children can develop good eating habits and ensure sufficient sleep. These are all necessary conditions for healthy human growth <sup>[7]</sup>.
- (3) Strengthening publicity guidance and providing sports resource support should increase the publicity intensity of knowledge related to the physical health of young people, to enhance public awareness of physical health, achieve a dual harvest of physiological and psychological health, and combine

entertainment and diverse leisure sports to attract more people, breaking through the rigid view of sports in the past and realizing the synergistic effect of entertainment and fitness <sup>[8]</sup>. Organize various sports activities, encourage young people to participate, and create an atmosphere where the whole society values sports.

## Disclosure statement

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# Constructing and Implementing a “Three-Tiered Progression” Practical Teaching Model for Animation-Related Majors: A Case Study of Shenzhen Polytechnic University

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**Abstract:** Amid the rapid expansion of the digital creative industry and continuous advances in technologies such as artificial intelligence, the animation sector increasingly requires practice-oriented, technology-integrated, and cross-disciplinary talent. However, higher vocational programs in animation still face persistent challenges. On the one hand, curricular frameworks are often “broad but shallow,” weakening teachers’ and students’ capacity to translate knowledge into industry practice. On the other hand, traditional course content has been slow to incorporate emerging technologies such as AI-generated content (AIGC), limiting the production of high-level innovative outcomes. This paper analyzes these challenges in current animation education and proposes reform directions.

**Keywords:** Digital creative industry; Artificial intelligence; Animation major; Talent development; Higher vocational education; AI-generated content (AIGC)

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## 1. Introduction

With the growth of the digital creative economy and technologies such as artificial intelligence, there is a rising demand for practice-oriented, technology-integrated, and cross-disciplinary talent in animation-related majors. Yet talent cultivation in higher-vocational animation programs faces several obstacles. Many curricula are broad but shallow, which undermines instructors’ and students’ ability to transform knowledge into industry practice <sup>[1]</sup>. In addition, traditional courses lag behind the industry’s rapid uptake of AIGC and related tools, constraining high-level outcomes.

Today, the industry expects professionals not only to master conventional production skills but also to demonstrate fluency with digital pipelines, cross-media creativity, and literacy in technology integration.

However, many training models in higher-vocational institutions trail behind industrial practice, particularly in curriculum design and in mechanisms that incorporate new technologies in a timely way <sup>[2]</sup>.

## **2. Major issues in current talent cultivation for animation specialties**

### **2.1. Broad-but-shallow curriculum structures and weak industry alignment**

Many vocational animation programs privilege breadth over depth by offering numerous courses without sufficient cutting-edge content. This structure fragments knowledge and produces superficial skills, impeding the development of robust core competencies <sup>[3]</sup>. Moreover, instructors often lack current industry experience and exposure to new technologies, widening the gap between theory and practice and limiting students' adaptability and innovative capacity.

### **2.2. Traditional courses lag behind technological advancements**

As AIGC, virtual production, and real-time rendering mature across the animation pipeline, advanced technical literacy has become essential. Yet many courses still emphasize hand-drawn techniques or basic 3D workflows while neglecting AIGC applications, data-driven creation, and cross-media storytelling. Consequently, graduates struggle to meet expectations for emerging-technology skills, reducing both the quality and volume of innovative outcomes <sup>[4]</sup>.

## **3. Theoretical connotation of the “Three-Tiered Progression” practical teaching model**

Constructing a Three-Tiered Progression model requires clarifying its core concepts and operational mechanisms <sup>[5]</sup>.

### **3.1. Exercise: Unitized tasks for foundational skill acquisition and verification**

Within this model, an Exercise is a unit-level practical task designed to rehearse and verify a discrete knowledge element or skill. These tasks are typically context-bound and imitative; they emphasize procedural standardization and operational accuracy at the initial stage of knowledge internalization <sup>[6]</sup>. In a 3D animation sequence, for instance, controller binding or a foundational walk cycle constitutes a typical Exercise. The aim is to consolidate tool fluency and pipeline awareness, cultivating muscle memory and early problem-solving capacity through deliberate, spaced repetition. Accordingly, Exercises should be designed as a scaffolded, progressively complex sequence that underpins competency formation <sup>[7]</sup>.

### **3.2. Work: Integrated artistic expression demonstrating comprehensive abilities and innovation**

A Work is an artistic creation that integrates knowledge and skills from multiple courses and incorporates personal aesthetics and creativity to achieve completeness and originality <sup>[8]</sup>. It marks the transition from mastery to application, combining technical proficiency with innovative thinking. Typical examples include a short character animation or a game-ready character model accompanied by a playable demo. Compared with Exercises, Works emphasize wholeness, artistic merit, and narrative quality. Evaluation, therefore, moves beyond technical correctness to a multidimensional assessment of creativity, aesthetics, and technical execution. This stage is critical in transforming students from learners to creators.

### 3.3. Product: Outcomes validated by the market with practical and commercial value

A Product is an outcome that not only achieves artistic completeness but is also validated by the market and aligned with industry standards, demonstrating practical applications, user value, or commercial potential. It represents the highest tier of the Three-Tiered Progression model and directly reflects deep industry–education integration<sup>[9]</sup>. To qualify as a Product, an outcome must address specific market needs, satisfy industry technical specifications (for example, playback formats, rendering fidelity, and delivery requirements), and target a defined audience or client. Examples include IP character designs adopted by enterprises, revenue-generating animated series released on streaming platforms, and commissioned commercial animation produced for clients. Part of the evaluation, therefore rests with enterprises and the market, consistent with the vocational-education mission of serving development and promoting employment.

### 3.4. Progression: Advancing value, building ability, and deepening industry–education integration

Progression is the model’s core dynamic and unfolds along three dimensions:

(1) Value progression

Outcomes evolve from the use value of coursework to the artistic value of personal creativity and, ultimately, to commercial value aligned with market needs—gaining depth in meaning and breadth in impact along the way.

(2) Ability progression

Students move from single-skill operations to collaborative project work, and further to market engagement and product-oriented thinking, following a spiral trajectory that holistically strengthens professional and innovative capacities<sup>[10]</sup>.

(3) Industry-education integration progression

The connection between teaching and industry practice advances from initial project introduction (simulation), to standard implementation (alignment), and finally to outcome transformation (integration). School–enterprise collaboration deepens over time and ultimately merges into a unified whole; later stages subsume and elevate earlier ones<sup>[11]</sup>.

Any effective teaching model rests on a solid theoretical foundation. The Three-Tiered Progression model draws on three major theories:

(1) Constructivist learning theory: Constructivism holds that learners actively construct knowledge in authentic contexts through social interaction and purposeful use of resources. It provides the core pedagogical stance for this model: situated learning at the Work tier; collaborative inquiry in the transition from Work to Product; and active construction through completing Exercises, Works, and Products.

(2) Contextualization (Situated Learning): Instruction at the Work tier situates learning within authentic, complex industry projects, exposing students to real constraints and problems that drive motivation.

(3) Collaborative learning: Moving from Work to Product typically requires team-based production in which students pool expertise, negotiate meaning, and co-construct shared knowledge and workflows.

(4) Active construction: Students shift from passive reception to active exploration, troubleshooting, and practice by completing sequenced tasks (Exercise → Work → Product), thereby building their own knowledge, skills, and experience base.

(5) Outcome-Based Education (OBE): OBE holds that instructional design and delivery should be planned



from the outcomes students are expected to achieve. In this model, backward design begins by specifying the competency goals required at the Product tier (e.g., graduation requirements) and then derives the necessary Works and Exercises to support those goals, thereby restructuring the curriculum and its assessments accordingly <sup>[12]</sup>. All activities concentrate on moving students from Exercise to Product while ensuring that every learner has pathways to succeed.

- (6) Clear focus: Teaching, learning tasks, and assessment are aligned to promote progression from Exercise → Work → Product; the evaluation system is built to evidence and facilitate that progression effectively.
- (7) Expanded opportunities: OBE emphasizes the opportunity to succeed for all learners. The Three-Tiered Progression model respects individual differences, enabling students to ascend the capability ladder at their own pace and in their own way.
- (8) Industry-education integration and collaborative innovation theory: Industry–education integration is fundamental to modern vocational education, and collaborative innovation emphasizes coordination among multiple parties in knowledge, resources, actions, and performance to achieve innovation goals. Taken together, these concepts define the model’s mechanism: co-cultivation by schools and enterprises, resource synergy and sharing, and the creation of a micro innovation ecosystem that spans industry, education, research, and competition <sup>[13]</sup>.
- (9) Co-cultivation by multiple stakeholders: Enterprises participate across the entire talent development cycle by jointly defining standards, providing live projects, assigning mentors, and jointly evaluating and accepting outputs at the Product level, thereby establishing a dual-subject education framework led jointly by schools and enterprises.
- (10) Resource synergy and sharing: Schools and enterprises co-invest in technology, projects, equipment, and faculty across the Three-Tiered Progression, building shared practice platforms that enable resource complementarity and optimal allocation.
- (11) Innovation ecosystem building: By integrating industry, education, research, and competition, the model builds a micro innovation ecosystem where teachers, students, and enterprise engineers work together. It strengthens student innovation and speeds up both technology adoption and content innovation for the industry.

In summary, the Three-Tiered Progression model is grounded in constructivism for implementation, guided by OBE in design, and enabled by industry–education integration with collaborative innovation as its mechanism. Together, these frameworks underpin the model’s rigor and continued improvement.

#### **4. Achievements of the three-tiered progression practical teaching model**

The animation program has reconstructed its curriculum, course content, and evaluation methods around job competencies and emerging technological workflows. Leveraging the Vocational Education Teaching Resource Library for Film and Television Animation and multiple reform projects, the Exercise → Work → Product pathway has taken shape <sup>[14]</sup>.

Grounded in job requirements and industry trends, the school systematically restructured its professional curriculum. The core innovation is a project-centered teaching mechanism that overcomes the limits of traditional single-subject courses and enables cross-course integration of knowledge and skills.

Specifically, the school partnered with CCTV Animation Group to establish a Digital Animation Full-Process Production Training Platform, introducing authentic enterprise cases and production standards. The end-

to-end workflow, including preproduction planning, character design, modeling, rigging, and animation, shot compositing, postproduction effects, and final delivery, is embedded across relevant courses. In core offerings such as 3D Animation Production and Motion Graphics Design, students no longer perform fragmented drills; instead, they work in teams to deliver phased modules of real animation projects. Each academic year includes weeklong intensive practice blocks, during which students, co-mentored by instructors and industry experts, integrate earlier assignments into coherent, industry-standard animated works with complete narratives, effectively bridging knowledge acquisition and capability formation.

To enhance the precision of talent cultivation and provide multi-dimensional resources, the school has developed a tiered curriculum resource system centered on job competencies. Anchored in emerging roles and technological directions in the industry, the system comprises three tiers:

- (1) Basic module: Foundational art skills, software tools, and design theory.
- (2) Specialized module: Project-based course packages for specific roles such as modeler, animator, technical artist, and AIGC application developer.
- (3) Comprehensive innovation module: Cross-disciplinary collaboration and hands-on engagement with commercial projects, delivered through digital workshops and industry studios.

Building on this foundation, the school established a four-in-one resource system integrating Theory-Training-Certification-Promotion:

- (1) Theory: Project-based loose-leaf textbooks and online open courses.
- (2) Training: Practical training based on real enterprise cases and a virtual workorder system to strengthen hands-on skills.
- (3) Certification: Industry-recognized skill credentials.
- (4) Promotion: Outstanding works, jointly evaluated by the school and enterprises, are showcased on platforms such as CCTV Animation for market exposure and incubation. Some student Works have won awards at domestic and international festivals and progressed to IP commercialization.

In animation and digital media, the institution actively pursues technological innovation and sector leadership, building a closed-loop educational mechanism linking “technological innovation → curriculum application → competition outcomes → outcome transformation.” This loop drives continuous iteration and value lift, moving routine outputs towards industry-level excellence.

The school also maintains dynamic alignment between enterprise technology portfolios and curriculum content. In collaboration with leading companies such as Huawei, Fantawild, and Global Digital, the school co-founded the Digital Media Technology Collaborative Innovation Center to integrate cutting-edge tools and workflows, AIGC-assisted creation, real-time rendering, virtual production, high-precision motion capture, and 3D scanning, into teaching in a timely manner. Enterprise experts and faculty jointly form research and development (R&D) and teaching teams that both deliver industry projects and rapidly translate the latest R&D results into teaching projects and training modules, ensuring that course content keeps pace with technological advances <sup>[15]</sup>.

To implement a model that advances R&D, teaching, competition, and transformation in parallel, the school has formed several high-level teaching and research teams in frontier domains—including the AIGC Art Creation Studio, Virtual Reality Workshop, and Digital Animation Technology Laboratory—under a project-based management approach. A dual-mentorship system, jointly staffed by the faculty and enterprise mentors, guides students to engage directly in technological R&D and creative practice. Faculty–student teams undertake enterprise-commissioned projects and actively compete in high-level contests (e.g., the China International

“Internet+” Innovation and Entrepreneurship Competition, the National Vocational College Skills Competition, and digital-creative industry contests). This competition-driven approach strengthens teaching, learning, and research, establishing a sustainable mechanism for continuously enhancing technological application and innovation capacity.

Through this process, the school has established a systematic closed loop: innovations are integrated into classrooms via project-based courses and modular training; faculty and students leverage these results in major competitions, earning frequent national and provincial awards and generating strong demonstration value; and outstanding outcomes are commercialized and promoted through enterprise platforms, forming an end-to-end chain from technological breakthroughs to curricular application and social benefits. In terms of technological innovation and sector leadership, this approach has enabled continuous iteration from works to market-ready products. The curriculum remains dynamically aligned with enterprise technology portfolios; joint school–enterprise R&D focuses on AIGC, motion capture, and virtual production; high-level teams lead participation in competitions related to emerging technologies; and the R&D–teaching–competition–transformation model ensures the timely integration of new technologies into classroom practice.

This model has yielded a series of high-quality outcomes with broad industry influence and social recognition. Faculty–student teams have produced derivative Works for the Boonie Bears film series; created the animated promotional video for the Shenzhen–Zhongshan Link, aired on CCTV; and delivered multiple urban cultural IP digitization projects, all recognized for technical proficiency and artistic expression. These achievements highlight the institution’s strengths in cutting-edge technology application and cross-disciplinary innovation, while offering a reference-worthy “SPU solution” to persistent challenges such as the lag between teaching and technological development and the difficulty of translating innovative outcomes into practice.

Through sustained accumulation and practice, the animation program has achieved notable results in institutional development, social services, and international collaboration, forming a replicable and scalable model for vocational education.

**Institutional development.** The school has established four national-level elite courses, published two national “14th Five-Year Plan” vocational-education textbooks, and developed 12 university-level “golden courses,” accompanied by more than ten new-format textbooks. It has also reconstructed a specialized curriculum integrating posts, courses, competitions, and certifications. Over the past three years, faculty–student teams have earned more than 40 awards in high-level domestic and international competitions, including first prize in the National College Students Advertising Art Competition and the Best Animation Award at the Golden Strait International Microfilm Festival. Graduate outcomes have improved significantly, with employment rates above 98% for consecutive years; more than one-third of graduates have joined leading digital-creative enterprises such as Tencent, NetEase, and Fantawild.

**Social services and outreach.** The nationally recognized professional teaching-resource bank led by the institution has attracted more than 190,000 registered users, covering over 200 vocational colleges and 40 industry enterprises nationwide, effectively supporting cross-regional and cross-institutional resource sharing. Through industry–academia–research platforms, faculty and students have undertaken commissioned technical-service projects with cumulative funding exceeding RMB 7 million. The original animated IP, Mao Dou and Coffee Bean, has garnered more than 350 million online views, and multiple Works have been broadcast on CCTV’s General and Children’s Channels. The school has also hosted five national key teacher-training programs, training more than 200 teachers from over 30 institutions. Teaching outcomes have been presented at major events such as the National Vocational Education Conference and featured in authoritative media,

including China Education Daily.

International impact and standards development. The school has led the formulation of national standards in animation production and received the China Standard Innovation Contribution Award, underscoring its leadership in professional standardization. As a key member of the Shenzhen Protocol International Vocational Education Alliance, it has promoted mutual recognition of international standards in animation and exported specialized curriculum standards and teaching resources to Belt and Road partner countries such as Pakistan. Related achievements have been recognized as UNESCO exemplary cases and shared with 230+ institutions across 150+ countries and regions, providing a meaningful model for China's vocational education on the global stage.

## 5. Conclusion

The Exercise → Work → Product Three-Tiered Progression practical teaching model provides an effective pathway for deepening industry–education integration and elevating talent cultivation in animation specialties. By reconstructing a project-based curriculum, introducing authentic enterprise standards and workflows, and establishing platforms for outcome transformation, the model systematically addresses core deficiencies in traditional instruction, namely the disconnection between theory and practice, subjective assessment, and limited market adaptability. It fosters an educational ecosystem that integrates teaching, production, and innovation.

Evidence from Shenzhen Polytechnic University indicates that the model enhances students' comprehensive professional competencies, innovative mindsets, and labor-market competitiveness, yielding high-quality outcomes with both artistic and commercial value and generating broad demonstration effects. Looking ahead, the model should continue to iterate in response to rapid technological change (e.g., AIGC), deepen the internationalization of standards, and institutionalize long-term feedback mechanisms, to contribute a more generalizable paradigm for the high-quality development of vocational education in China.

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# Study on Influencing Factors of Laboratory Safety Awareness and Attitudes Among Students Majoring in Chemistry-Related Disciplines in Colleges and Universities

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**Abstract:** With the development of the times, the cultivation of laboratory safety awareness and attitudes among students majoring in chemistry-related disciplines in colleges and universities should attract people's attention and focus, which is also an important foundation and prerequisite for improving the level of laboratory safety. To this end, teachers should conduct research on curriculum construction, cultural atmosphere creation, and teaching management, so as to further enhance the laboratory safety awareness and attitudes of students majoring in chemistry-related disciplines in colleges and universities.

**Keywords:** Colleges and universities; Chemistry-related disciplines; Laboratory safety awareness; Influence

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## 1. Significance of cultivating laboratory safety awareness and attitudes among students majoring in chemistry-related disciplines in colleges and universities

### 1.1. Ensuring the safety of teachers' and students' lives and property

In college teaching, chemistry-related laboratories usually use various hazardous chemicals, including various strongly corrosive acids and alkalis, many flammable and explosive reagents, and even some chemicals with strong toxicity. If these chemicals are misoperated during laboratory use or neglected in daily management, it is easy to lead to serious safety incidents such as explosions, fires, or poisoning <sup>[1]</sup>. Therefore, we should actively carry out the cultivation of laboratory safety awareness and attitudes among students majoring in chemistry-related disciplines in colleges and universities, enable students to have correct attitudes and awareness, and guide them to abide by relevant laboratory regulations and procedures through education and training. This can fundamentally reduce the probability of hazardous situations. In addition, carrying out such cultivation can

prevent teachers and students from physical and mental harm, ensure the safety of various laboratory equipment in schools, and is of great significance for improving the stability and harmony of the campus environment.

## **1.2. Ensuring the smooth conduct of experimental teaching and scientific research**

In laboratory teaching and daily scientific research activities, safety is a crucial issue that cannot be ignored. If students lack corresponding safety awareness and fail to comply with relevant regulations when conducting chemical experiments, it is easy to cause damage to various experimental equipment, lead to distortion of some experimental data, and even adversely affect some normal experimental projects and scientific research content, thereby resulting in a waste of teaching time and resources <sup>[2]</sup>. Conversely, if students can be cultivated to develop a good attitude and awareness, enabling them to strictly follow operating procedures and standards and properly use various experimental supplies when conducting experiments, the efficiency of experiments will be greatly improved, and the smooth implementation of experimental activities will be guaranteed. By enhancing the laboratory safety awareness and attitude of college students majoring in chemistry-related fields, the output efficiency of scientific research results can be significantly improved, and the overall level of practical work can be further advanced.

## **1.3. Cultivating students' professionalism and sense of responsibility**

In their future careers, students majoring in chemistry-related fields often choose to work in industries such as chemical enterprises and pharmaceutical companies. These industries themselves have high safety requirements, and there are many potential hazards in practical work. If students fail to operate in accordance with relevant regulations, various problems may arise <sup>[3]</sup>. For this reason, in the teaching process, teachers should actively cultivate the laboratory safety awareness and attitude of college students majoring in chemistry-related fields, help them develop good professionalism and moral qualities, deepen their understanding of work safety, and enable them to abide by relevant norms in daily study and life, thereby helping students form good behavioral habits. Cultivating the laboratory safety awareness and attitude of college students majoring in chemistry-related fields can lay a solid foundation for their future employment and greatly enhance their industry competitiveness and career development potential.

# **2. Problems in the laboratory safety awareness and attitude of college students majoring in chemistry-related fields**

## **2.1. Weak safety awareness**

An analysis of current teaching work shows that many students do not have good safety awareness in their daily study, which will greatly hinder their subsequent learning activities and the improvement of experimental skills, and is not conducive to their better employment in the future <sup>[4]</sup>. When conducting chemical experiments, many students tend to ignore safety regulations. For example, some students may forget to wear goggles, lab coats, and gloves during experiments, which will greatly increase the risk of injury. In addition, some students may change the experimental process during the experiment, and some may arbitrarily adjust the amount of reagents and change reaction conditions without authorization. All these behaviors will greatly increase the potential risks of the experiment and significantly reduce its safety. Moreover, after the experiment, due to weak safety awareness, many students fail to clean up experimental waste in a timely manner or forget to turn off the power of the instruments. These behaviors seriously violate the relevant regulations of the laboratory, may

cause environmental pollution to a certain extent, and even trigger safety accidents <sup>[5]</sup>. The occurrence of these behaviors reflects that students' experimental safety awareness is insufficient, and they do not realize that their behaviors will put themselves and others in danger.

## **2.2. Lack of safety knowledge**

At this stage, some students have insufficient access to laboratory safety knowledge, which makes it difficult for them to deeply understand the properties of hazardous chemicals. This may lead to non-standard practices in actual operations. When problems arise, some students do not know how to handle them, which also adversely affects experimental safety <sup>[6]</sup>. In addition, during practical experimental operations, students come into contact with many precision instruments. Some students are not familiar enough with the operation of these laboratory instruments, which may also cause misoperations during experiments and thus create potential safety hazards. When encountering sudden safety incidents such as chemical leaks or fires, these students lack the necessary emergency knowledge and skills, making it difficult for them to respond promptly, mitigate the impact of the accident, and ultimately result in unnecessary losses.

## **2.3. Incorrect attitudes and lucky mentality**

In daily educational activities, teachers can observe a phenomenon: some students hold incorrect attitudes towards laboratory safety regulations, and many often have a lucky mentality during experiments, thinking that dangerous accidents will not happen to them <sup>[7]</sup>. When conducting experimental operations, some students adopt the attitude that "occasional non-compliant operations will not cause any problems." They turn a blind eye to safety precautions repeatedly emphasized by teachers and are unwilling to participate in the learning and practice of safety knowledge, resulting in a very incorrect safety attitude that easily exposes them to dangers during experiments. Furthermore, such incorrect attitudes will hurt other students, thereby reducing the overall effectiveness of laboratory safety management work and significantly increasing the risk of laboratory safety incidents.

# **3. Strategies for cultivating laboratory safety awareness and attitudes among students majoring in chemistry-related disciplines in universities**

## **3.1. Strengthen the construction of safety education courses**

To further improve the effectiveness of cultivating laboratory safety awareness and attitudes among university students majoring in chemistry-related disciplines, we should attach importance to the construction and optimization of safety education courses and introduce more high-quality content into the classroom, thereby significantly enhancing the safety level of the laboratory environment. To this end, teachers should incorporate laboratory safety education into the goals of daily education and build a more systematic safety curriculum system. In addition to covering some theoretical knowledge of laboratory safety, this curriculum system should also include the characteristics of various chemicals, as well as relevant laboratory regulations and legal requirements <sup>[8]</sup>. Moreover, teachers can introduce practical operation skills into the curriculum system based on students' actual situations, enabling students better to master the operation methods of various safety equipment and correctly handle hazardous waste. To improve students' ability to respond to laboratory safety issues, teachers should help them acquire more emergency handling knowledge to correctly deal with various accidents when problems arise and master the corresponding emergency methods and procedures <sup>[9]</sup>. In addition, the curriculum

system can be reformed and optimized according to students of different types and grades to ensure the coherence and pertinence of teaching content, thereby greatly improving the effectiveness of cultivating laboratory safety awareness and attitudes among university students majoring in chemistry-related disciplines.

To enhance the level of cultivating laboratory safety awareness and attitudes among these students, we should try to introduce more educational methods, use multimedia tools for auxiliary teaching, and display the harmfulness of laboratory accidents to students through vivid videos and pictures, so that students can have a more intuitive understanding of laboratory accidents <sup>[10]</sup>. Furthermore, teachers can attempt to introduce the blended teaching method into the cultivation of laboratory safety awareness and attitudes among students majoring in chemistry-related disciplines in universities, thereby helping students access more high-quality resources and supporting their self-directed learning activities. In addition, teachers can use virtual simulation technology to simulate some experimental scenarios, so as to improve students' safety awareness and operational capabilities.

### **3.2. Fostering a safety culture atmosphere**

To enhance the effectiveness of cultivating laboratory safety awareness and attitudes among college students majoring in chemistry-related fields, teachers can create a higher-quality safety culture atmosphere, exposing students to more laboratory safety culture content in daily life, and increasing their level of attention to the issue. To this end, universities can regularly organize promotional activities, including various knowledge lectures and laboratory safety-themed exhibitions. These activities can improve students' cognitive level and make them attach greater importance to laboratory safety <sup>[11]</sup>. When holding laboratory safety lectures, we can invite experts and scholars to the university to share their experiences. In laboratory safety-themed exhibitions, we can display various laboratory safety equipment, operating specifications, warning pictures, etc., for students, thereby creating a better safety atmosphere. Furthermore, universities can collect laboratory safety slogans to encourage students to participate more proactively and actively in the construction of laboratory safety.

In cultivating the laboratory safety awareness and attitudes of college students majoring in chemistry-related fields, we should attach importance to the selection of safety models and carry out cultivation work through the power of role models, which is also an important measure to improve students' laboratory safety awareness. Therefore, in practical teaching, we should abide by relevant rules and regulations, reward students who perform well, and make them role models for other students. At the same time, we should also set an example in daily teaching, strictly implement various laboratory regulations, and ensure the rationality and scientificity of laboratory operation procedures, to guide students to form good safety awareness <sup>[12]</sup>. In the long run, a laboratory safety atmosphere of "everyone participates and everyone values" will gradually take shape on campus, improving the level of cultivating laboratory safety awareness and attitudes among college students majoring in chemistry-related fields.

### **3.3. Strengthening experimental teaching management**

To further enhance the effectiveness of cultivating laboratory safety awareness and attitudes among university students majoring in chemistry-related fields, we should attach importance to optimizing laboratory teaching management and formulate a more reasonable and scientific manual of laboratory operation specifications. This manual should include the operating procedures for various experiments, ensuring that students have a clear understanding of all links from experiment preparation to completion, thereby preventing laboratory safety incidents. In addition, the manual should clearly specify laboratory safety precautions to prevent potential hazards