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# Reflections on Integrating Excellent Traditional Chinese Culture into High School History Teaching

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**Abstract:** There is a close connection between high school history and excellent traditional Chinese culture. By infiltrating traditional culture, the quality of history courses can be enhanced, the growth needs of students can be met, and good teaching results can be achieved. From the perspective of high school history, this paper analyzes the value of integrating excellent traditional Chinese culture into high school history teaching and proposes specific practical strategies. The aim is to stimulate students' enthusiasm for learning knowledge, cultivate their traditional culture-related abilities, ensure their healthy development, and provide references for optimizing high school history teaching.

**Keywords:** Excellent traditional Chinese culture; High school history; Teaching

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## 1. Introduction

With the deepening of the new curriculum reform, the teaching environment of high school history has changed significantly, and teaching requirements have also increased. More attention is paid to the improvement of students' core literacy and traditional culture-related abilities. However, considering the current situation of high school history teaching, it still mainly relies on indoctrination-based teaching, paying insufficient attention to students' comprehensive historical skills<sup>[1]</sup>. Therefore, in the teaching practice of high school history, integrating excellent traditional Chinese culture can improve teaching quality, create a good cultural environment, cultivate students' sense of historical responsibility, enhance their patriotism, and promote the inheritance and development of traditional culture.

## 2. Values of integrating excellent traditional Chinese culture into high school history teaching

### 2.1. Meeting the needs of history teaching

In high school history teaching, the key task is the inheritance of excellent traditional Chinese culture. Teachers

need to strengthen guiding activities, enable students to give full play to the role of materialist values, and cultivate students' historical and innovative awareness. At the same time, teachers should carry out incentives so that students can adopt an attitude of inheritance and criticism, maintain an open-minded attitude, and view traditional culture correctly<sup>[2]</sup>. In the above process, teachers can improve teaching quality, help students feel the charm of traditional culture, enable them to gain more knowledge, and achieve the improvement of cultural literacy. By integrating excellent traditional Chinese culture into high school history teaching, the learning and experience of students can be optimized. It helps students understand their cultural roots and provides assistance for their all-round development, enabling them to gradually grow into modern students with a strong cultural foundation.

## **2.2. Cultivating moral and patriotic qualities**

In the process of high school history teaching, teachers can adopt appropriate teaching methods to promote the integration of traditional culture and teaching content, cultivate students' national spirit, enhance their national self-confidence, and make them feel a strong sense of national pride<sup>[3]</sup>. Since there is a close connection between excellent traditional Chinese culture and the national spirit, in the teaching activities of high school history, incorporating excellent traditional Chinese culture can create a good curriculum context.

Traditional culture contains rich patriotism and moral concepts. Integrating it into high school history classrooms is helpful for cultivating students' patriotism. Teachers can optimize teaching activities by using relevant cultural resources, stimulate students' enthusiasm for learning knowledge, cultivate their goodwill, and escort their subsequent healthy growth<sup>[4]</sup>.

## **3. Practical strategies for integrating excellent traditional Chinese culture into high school history teaching**

### **3.1. Grasping textbook content and exploring cultural elements**

High school history textbooks are based on the historical knowledge structure and students' academic levels. In the teaching practice, teachers need to pay attention to exploring the traditional cultural content in textbooks and clarify it as the key point of teaching content. From the perspective of classroom teaching, teachers should not only focus on theoretical knowledge teaching but also integrate historical materials and social hot topics to enhance the fun of teaching activities, improve the effectiveness of the classroom, and enhance students' learning effects<sup>[5]</sup>.

For example, when teaching the content related to the Contention of a Hundred Schools of Thought, teachers can take the textbook as a basis and interpret the thoughts of Xun Kuang. High school history textbooks usually compile historical materials related to teaching content. Teachers need to pay attention to integrating relevant content to help students deeply understand key knowledge. Teachers can select representative viewpoints according to the curriculum objectives and students' learning situations and conduct communication activities with students. For example, the saying "Those who criticize me correctly are my teachers" contains Xun Kuang's thoughts. Through the guidance of teachers, students can communicate about the content and deepen their understanding of traditional culture<sup>[6]</sup>.

### **3.2. Creating a cultural context to enhance the classroom experience**

When integrating excellent traditional Chinese culture into high school history classrooms, teachers can create a historical and cultural context, build an immersive platform, enhance students' classroom participation, and

encourage them to feel the charm of historical culture from different perspectives. For example, when teaching the content related to the Spring and Autumn Period and the Warring States Period, teachers can set up virtual activities and adopt the method of role-playing to encourage students to have an intuitive understanding of the relationships between different states<sup>[7]</sup>. In the classroom teaching process, students can play the representatives of different vassal states, such as Qin, Zhao, and Han. Through guiding activities, teachers encourage students to understand the historical backgrounds of the states they represent, and clearly understand their political, economic, and military capabilities. When creating a historical and cultural context, teachers need to provide students with costumes, props, and other items to improve the teaching effect and help students feel the charm of historical knowledge. In the specific activity practice, teachers can encourage student representatives to actively conduct diplomatic activities on behalf of vassal states, and vividly display the ancient diplomatic scenes through interactive communication. In addition, teachers can also encourage students to communicate based on historical events. For example, when Qin and Chu formed an alliance to compete for land and population, students can express their opinions in a timely manner and simulate the negotiation and agreement signing between countries. By giving full play to the interactivity of role-playing, it can help students have an intuitive understanding of historical events, clearly understand the complex diplomatic relationships between vassal states and relevant knowledge, and cultivate their public speaking and critical thinking abilities<sup>[8]</sup>. Students' active participation in classroom practice can deepen their understanding of historical knowledge, form a good perception and experience, and effectively enhance students' enthusiasm for learning history.

### **3.3. Carrying out group cooperation to understand traditional culture**

During the historical development of our country, a lot of excellent traditional culture has emerged. In order to inherit the culture and improve the quality of high school history teaching, teachers need to view traditional culture dialectically, promote the infiltration of excellent traditional culture, and constantly resist cultural dross. From the perspective of high school history classrooms, teachers need to strengthen guidance so that students can adopt a dialectical concept to understand traditional culture, learn, and master historical knowledge. Through history classroom teaching activities, it is helpful to spread advanced culture with positive influence, cultivate students' moral values, accumulate good cultural strength, and lay a foundation for the great rejuvenation of the Chinese nation<sup>[9]</sup>.

To improve the quality of history courses, teachers need to pay attention to high school history teaching activities, strengthen guiding activities, and enable students to participate in group cooperation and carry out good thinking and exploration activities. Due to the differences among students, their understandings and views of the same things vary. Through the collision of ideas, unique wisdom can be shown, which provides assistance for students' healthy development. For example, when teaching the content related to the exchange between traditional culture and feudal dross culture, teachers can divide students into different groups according to their situations and clarify the overall goals of the course. Group members can conduct activities such as data search and content integration to form viewpoints with the characteristics of their own groups<sup>[10]</sup>. After completing the course preparation work, students can communicate in the classroom and show their thinking and exploration characteristics. Through the implementation of group cooperation activities, the course content can be enriched, and its connotation can be enhanced. Some student groups organize feudal dross cultures, such as the superiority of men over women and the supremacy of parental authority; some groups collect excellent traditional Chinese culture, analyze the formation of the culture, and explain the reasons for its promotion. After the high school history course is completed, students can gain more knowledge, broaden their horizons,

and dialectically understand and view traditional culture<sup>[11]</sup>. Through group communication activities, students' dialectical thinking abilities can be cultivated. They can understand which traditional cultures are worthy of promotion and which need to be discarded. Through the collation and adjustment of information, students' traditional cultural values can be cultivated, and the quality of history classrooms can be effectively improved. Through the communication and cooperation of student groups, traditional culture can be viewed dialectically, and traditional culture can be effectively promoted, thus effectively improving the course quality.

### **3.4. Utilizing cultural programs to cultivate humanistic qualities**

From the perspective of students, their humanistic qualities involve many aspects, such as a deep understanding of culture, art, and other contents, containing the values and knowledge of industries such as history, literature, and art. By cultivating students' humanistic qualities, it can help them establish a good worldview, form good critical and aesthetic abilities, and promote the inheritance of excellent traditional Chinese culture. To cultivate students' humanistic qualities, teachers also need to pay attention to carrying out cultural programs and optimizing classroom activities. For example, teachers can set a fixed time to regularly carry out classical literature-themed reading activities<sup>[12]</sup>. In the actual classroom preparation process, under the guidance of teachers, students can select good classic works, conduct in-depth research combined with the background and literary value of the works, and lay a foundation for the recitation of the works. In the specific cultural program, students can wear Hanfu to get closer to ancient culture, master the content of traditional music, and carry out good recitation activities to enhance the vividness and appeal of literary recitation. Through the above activities, it is helpful to cultivate students' language expression and literature appreciation qualities and deepen their understanding of excellent traditional Chinese culture. In addition, in high school history classroom teaching, teachers can also use activities such as traditional music and opera for performance, so that students can understand the performance of traditional musical instruments such as the guzheng and understand traditional opera art. In the practical teaching of high school history classrooms, by incorporating the content of the guzheng, students can master basic performance skills, understand the history and cultural connotations of the instrument, deepen their understanding of knowledge, and cultivate their humanistic qualities. By carrying out educational value-based practical activities, students can not only participate in hands-on and operational activities but also use the method of simulated performance to help them have an intuitive understanding of the charm of traditional art and deeply understand historical and cultural knowledge<sup>[13]</sup>. The implementation of cultural programs can transform abstract historical knowledge into practice, enable students to participate in hands-on and practical activities, help them have personal experiences, and deeply understand the connotations of traditional art. At the same time, the above activities can make students cherish traditional culture more, cultivate their cultural self-confidence, and enhance their enthusiasm for learning and spreading traditional culture.

### **3.5. Skillfully using information technology to effectively present history**

In order to dynamically present the content of history textbooks, teachers need to attach importance to the use of advanced technologies such as multimedia and virtual reality to display historical events and character stories, and improve teaching effectiveness. Through forms such as videos and pictures, students can have sensory experiences such as vision and hearing. Historical events can be presented in a vivid and intuitive way, helping students have a comprehensive perception and directly understand the content of traditional culture<sup>[14]</sup>. For example, when teaching the content related to the history of the Song Dynasty, in order to



optimize the classroom environment, teachers can use 3D animation technology to display the confrontation scene between the Song and Liao dynasties. For example, teachers can use animation to display the landforms of the Yellow River Basin to help students understand the deployment of the Song army. At the same time, teachers can also use virtual reality technology to create the decision-making process of the imperial court, enable students to experience the way of issuing military orders, and understand the training scenes of soldiers under the conscription system, such as sword-training and archery, helping students experience the lives of soldiers in the Song Dynasty. In addition, the use of VR technology can simulate tactical exchanges and display the strategies of the Song army in resisting invasions and launching attacks. The actual simulation activities can not only enable students to view history but also directly display the military situation in the Song Dynasty, no longer limited to text descriptions. Students can obtain an immersive experience, effectively enhance the fun of traditional culture-themed history classrooms, and improve students' classroom participation<sup>[15]</sup>.

## 4. Conclusion

In conclusion, in the teaching of high school history, textbooks contain many elements of excellent traditional Chinese culture, which are highly generalized and abstract. In order to effectively carry out history teaching activities, teachers need to attach importance to the integration of traditional culture, pay attention to teaching adjustments, and optimize teaching methods and strategies. The integration of excellent traditional Chinese culture into history classrooms is not only helpful for the inheritance of national memories but also can enhance students' love for historical culture. Specifically, teachers can carry out group cooperation activities, skillfully use multimedia technology, create historical and cultural backgrounds, etc., to improve the teaching effect of high school history and transform abstract cultural knowledge into vivid teaching content. The implementation of the above teaching activities is helpful for cultivating students' correct values, making them more identify with traditional culture, and forming a good sense of national pride and self-confidence.

## Disclosure statement

The author declares no conflict of interest.

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# A Study on the High-Quality Development of Junior High School Physical Education and Health Classroom Teaching

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**Abstract:** In the new educational and teaching environment, teaching work at each stage is continuously updated to ensure high-quality development. By applying new teaching ideas, educators can truly enter the growth space of students, enabling them to have in-depth experiences and insights, thereby continuously enhancing students' interest in learning. For junior high school physical education and health courses, during the actual reform process, it is more necessary to base on the methods mentioned in this article, deeply improve the curriculum system, connect with high-quality development, promptly transform the roles of teachers and students, set clear teaching goals, and help students establish the awareness of lifelong physical education. This ensures the comprehensive physical and mental growth and progress of students and enhances the actual quality of classroom teaching.

**Keywords:** Junior high school physical education and health; Classroom teaching; High-quality development

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## 1. Introduction

Regarding the current teaching reforms at all stages, it is necessary to improve the teaching steps, introduce advanced teaching concepts, and avoid simply relying on textbooks. Instead, attention should be paid to the development of students' comprehensive qualities and abilities, enabling students to explore the connotations of courses and demonstrate their educational values and significance. Only in this way can students deeply understand and apply the course content and achieve the educational and teaching tasks of high-quality development. As teachers of junior high school physical education and health, we should follow the student-centered educational and teaching concept, expand the scope and space of students' training, appropriately break through the teaching content, reverse the dull atmosphere in the classroom, make students aware of the far-reaching impact of sports on life, cultivate students' perseverance, enhance students' understanding of sports

knowledge, cultivate students' sentiment, and help students quickly and accurately master sports skills, so as to continuously improve the efficiency of junior high school physical education and health classroom teaching. Then, in the actual development process of junior high school physical education and health classroom teaching, what effective methods should be adopted to achieve high-quality operation?

## **2. Significance of high-quality construction of junior high school physical education and health classrooms**

### **2.1. Promoting students' all-round development**

Junior high school is a crucial period for students' physical and mental development. A high-quality physical education and health classroom provides a platform for the coordinated development of students' physical, mental, and social adaptation abilities through systematic sports skill teaching, scientific physical fitness training, and diverse health knowledge dissemination. Standardized physical education teaching can help students develop correct postures, enhance physical functions, and reduce the incidence of "civilization diseases" such as myopia and obesity, laying a physiological foundation for lifelong health<sup>[1]</sup>. At the same time, challenge-based learning in the classroom cultivates students' perseverance, and emotional management training in group competitions can improve psychological resilience, enabling them to cope with academic pressure with a positive attitude. In addition, cooperative sports projects guide students to understand the sense of rules and responsibility, and the influence of sportsmanship can cultivate social communication qualities such as fair competition and respect for others, enabling students to improve their comprehensive qualities while having a strong physique.

### **2.2. Improving the effectiveness of physical education teaching**

Traditional physical education classrooms have problems such as fragmented content and single teaching methods. High-quality construction realizes a paradigm shift from "teaching textbooks" to "educating students" by optimizing the curriculum system and teaching strategies. On the one hand, based on the curriculum design oriented by core qualities, the training goals of sports ability, healthy behavior, and sports morality are deeply integrated into the teaching content. For example, the application value of knowledge can be enhanced through interdisciplinary integration<sup>[2,3]</sup>. On the other hand, innovative means such as hierarchical teaching, scenario simulation, and smart sports are used to accurately meet the individual differences of students. For students with weak sports foundations, gamified introductory teaching is adopted to reduce their fear of difficulties, and for students with special talents, advanced training modules are set up to stimulate their potential. At the same time, technologies such as heart rate monitoring devices and motion capture systems are used to provide real-time feedback on learning effects, transforming the inefficient "one-size-fits-all" classroom into "precision-oriented" efficient training, truly making each class an effective carrier for students to improve their sports literacy.

### **2.3. Meeting the needs of social development**

Under the superposition of the Healthy China Strategy and the "Double Reduction" policy, the high-quality construction of junior high school physical education and health classrooms is an inevitable choice for education to return to its essential role of cultivating people. The current social demand for talents has shifted from single-knowledge-based to "physically and mentally healthy + innovative ability" compound-type. High-quality classrooms strengthen the educational function of sports and cultivate future citizens with strong physiques and sound personalities for society. The sense of rules and frustration-resistance abilities developed by students



through physical exercise are exactly the core soft skills required in the modern workplace<sup>[4-7]</sup>. The education on healthy lifestyles infiltrated in the classroom can promote the popularization of the concept of national health through the radiation effect of “educating one student and influencing one family.” In addition, in the face of the practical challenge of the urgent need to improve the physical health level of adolescents, high-quality classrooms respond to the urgent expectation of society for “improving the quality and efficiency” of physical education through professional and systematic teaching reforms. This not only implements the fundamental task of cultivating virtue and nurturing people but also educates and molds people through sports.

### **3. Strategies for the high-quality development of junior high school physical education and health classrooms**

#### **3.1. Carrying out subject-oriented reforms to improve sports skills**

In the past, in the process of promoting junior high school physical education and health courses, due to a lack of awareness of the importance of students in the classroom, students’ sports directions were not precise enough, which hindered the high-quality development of classroom teaching. To change this situation, teachers of junior high school physical education and health are committed to subject-oriented educational and teaching reforms. They spread advanced teaching concepts through diversified channels, integrate more knowledge, highlight students’ personalities, meet the actual needs of different types of students, improve teaching content, innovate in courses, cultivate students’ strong sports awareness, help students find skills, follow students’ wishes, and form a unique teaching system. Only in this way can students have enough confidence to meet the challenges in sports, develop their unique personalities, and improve their sports skills. For example, before each class, to ensure the smooth implementation of warm-up exercises, teachers can adopt subject-oriented training activities and let students do some simple exercise routines, truly providing opportunities for every student to participate. This way, teachers can deeply understand students’ sports conditions, provide convenient sports methods, find skills, and enable students to fully display their abilities<sup>[8]</sup>. Another example is when learning the passing and receiving skills of basketball. In addition to technical training, activities of the upper limbs, arms, and fingers should be planned in advance to ensure that students conduct skill training after sufficient warm-up, which can also prevent sports injuries. Specifically, activities of the hands, thumbs, palms, arms, and elbows can be added to the exercise routine, and proper guidance can be provided. For students of medium-level skills, a paired-practice method can be adopted, that is, two students practice basketball skills by passing and receiving the ball to each other. For students who have mastered the essentials of basketball, triangular passing practice can be carried out. Students are divided into teams A, B, and C. Player A1 passes the ball to B1 and then runs to the end of team B. B1 passes the ball to C1 and runs to the end of team C. Then C1 passes the ball to A2 and runs to the end of team A, which also enlivens the classroom atmosphere<sup>[9]</sup>.

#### **3.2. Utilizing modern equipment to improve analytical abilities**

With the full-scale advancement of Internet technology, it can clearly present course content and help students conduct correct analysis. This not only enables students to express themselves verbally but also continuously improves their overall qualities and abilities. Therefore, to achieve the high-quality development of junior high school physical education and health courses, teachers can appropriately use modern equipment to decompose movements. Teachers should watch the decomposed movements with students, help them conduct systematic analysis, extract new teaching resources, simplify complex knowledge, ensure in-depth classroom teaching reform, propose more effective measures, and make the classroom teaching more exciting. For example, in

the training of forward rolls, teachers can use information technology to collect video movements related to forward rolls and form a coherent training method. This allows students to carefully analyze and distinguish, add interesting activities, ensure that the training items and processes of forward rolls are impressed in every student's mind, enable students to clearly demonstrate the movements, gradually cultivate students' good habit of independent training, and let students personally experience the joy brought by forward roll movements. Another example is to make full use of the current popular AI technology. Encourage the purchase of advanced equipment to create a good campus cultural environment and a physical education classroom environment. An AI-intelligent area can be set up on the playground to monitor students' performances in the standing long-jump event. The system can accurately calculate key data such as students' take-off angles, arm-swing amplitudes, flight heights, average speeds, and final scores, and also help students find techniques to jump farther and more easily<sup>[10,11]</sup>. If it is detected that a student's take-off angle is too small, resulting in insufficient horizontal displacement, the system can promptly broadcast a voice prompt to assist the student in adjusting the angle for take-off practice. Teachers can also cooperate by designing crossbars of specific heights to help students learn to take off, improve their standing long-jump scores and jumping abilities, and prepare for the training of more sports projects. There are many such examples. The application of modern technology in physical education can assist theoretical and practical teaching and achieve a multiplier effect in educating students.

### **3.3. Organizing practical activities to improve training effects**

Instead of carrying out practical activities according to a unified standard, it is necessary to consider students' psychological acceptance abilities. This can not only highlight students' advantages but also continuously improve the training effects. In such an environment, students will actively accept knowledge and choose training strategies suitable for themselves. Therefore, in the actual development process of junior high school physical education and health courses, teachers need to start from different perspectives, carefully select, properly organize practical activities, continuously transfer knowledge, integrate theoretical courses into students' real lives, help students think efficiently, organize students for in-depth training, and enable students to more comprehensively absorb and transform sports projects, so as to continuously improve the training effects of sports projects<sup>[12,13]</sup>. For example, in the classroom teaching practice of long-jump movements, teachers can use visual demonstration methods to let students actively explore and communicate with them to find the movement skills. Subsequently, organize competition activities to guide students to gradually master the take-off postures, take-off heights, landing buffers, and other movements, form a complete knowledge system, and improve students' training quality. Another example is to organize volleyball free-play activities. Students can easily master the basic hand gestures and movements and can participate in sports games and competitions within half a semester. For physical education teachers, more practical and competitive tasks can be designed to improve the training effects. First, divide the students in the class into two teams, and the teacher can act as a referee or even participate in the game to support one of the teams. This can bring a better classroom sports experience and effectively train and improve students' volleyball skills and comprehensive sports levels in the class. It is believed that after several semesters, some students will be able to master multiple volleyball skills and tactics proficiently, fall in love with volleyball during practical activities, maintain a long-term interest and enthusiasm for volleyball, and lay a solid foundation for the exchange and practice of other sports projects and disciplines.

### 3.4. Implementing gamified education and the concept of Sunshine Sports

Looking back at the requirements of the Sunshine Sports concept for junior high school physical education, it is to help junior high school students love sports, participate in sports, and develop healthy living habits invisibly. Under the background of comprehensive quality education, this concept coincides with the current student-centered and ability-based ideas. Therefore, in junior high school physical education, it is necessary to explore the connotations of the Sunshine Sports concept, actively organize and carry out gamified teaching, and promote the exchange and practice of various sports projects. Teachers should not only do a good job in teaching design and resource preparation before class but also predict students' sports effects to guide teaching goals, teaching content, and teaching methods, so as to turn the physical education classroom into a platform for students to exchange and practice sports, and thus cultivate the all-round development of junior high school students' physical and comprehensive qualities<sup>[14]</sup>. Of course, in the actual teaching design process, physical education teachers should also incorporate their understanding of the characteristics and growth laws of junior high school students and strive to build a teaching platform that is conducive to students' exercise and development around the student-centered concept. For example, before each physical education class, teachers have students do running exercises for 5–10 minutes, and the sports committee member should manage and control the neatness and running speed of the team to keep the running team horizontal and vertical and moving at a uniform speed. Junior high school students gradually form the habit of warming up before exercise and participate in sports more actively<sup>[15]</sup>. Another example is to organize students in each class to do running exercises for 10–15 minutes during the morning break or after the seventh class. Sports games can also be interspersed during this period, organized by class or grade, to further enliven the relatively boring group sports and bring interesting sports experiences to junior high school students. Junior high school students gradually adapt to integrating sports into their campus lives, implement the new concept of Sunshine Sports, and develop good sports habits.

## 4. Conclusion

Generally, the high-quality development of classroom teaching should be linked to the operation trend of the curriculum standards, give full play to students' subjective initiative, more effectively promote the in-depth development of classroom teaching, innovate the teaching structure, ensure that the classroom teaching is more vibrant, and meet the development direction of the new era. As teachers of junior high school physical education and health, we must pay attention to the development of students' quality education through the above-mentioned methods, deeply understand the connotations of high-quality teaching, reveal its unique teaching laws, create a good training environment, find the key points of classroom teaching from multiple perspectives, form a complete teaching plan, provide in-depth feedback, enhance students' training awareness, and cultivate students' good training habits, so as to continuously improve the quality of classroom teaching.

## Disclosure statement

The author declares no conflict of interest.

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# Innovative Paths for Campus Media in the Context of Media Convergence

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**Abstract:** The rapid development of Internet technology has made “Internet +” a hallmark of the current era. The transformation and development of traditional media into all-media have provided a guiding direction for the development of campus media. The traditional form of campus media, which mainly consists of campus newspapers and campus radio, can no longer meet the application demands of modern higher education for media. In line with the current media convergence environment, campus media need to actively innovate to achieve their own development and progress in keeping with the times. This article explores the innovation path of campus media in the context of media convergence, analyzing the promotion of campus media innovation by the development of new media, the diversification of campus media innovation, and the effective ways of campus media innovation, in order to promote the realization of the innovation and development goals of campus media in the context of media convergence.

**Keywords:** Media convergence; Campus media; Innovation

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## 1. Introduction

The current social development background of media convergence is seeing new media and all-media penetrating and extending into campus media. However, the media functions of campus media have not been fully reflected, mainly due to the overly formal integration of campus media with new media, lacking the innovative thinking required by Internet media. According to relevant data statistics from the National Internet Information Center, as of 2024, the number of Internet users in China has reached 972 million, among which the number of mobile Internet users accounts for 97.5% of the total number of Internet users. The influence of mobile Internet on people’s lives has surpassed that of traditional Internet forms. For college students, smartphones are not only communication tools but also a new type of social media platform. Obtaining information through mobile Internet has become the preferred method for college students. Discussing the innovation of campus media in the context of media convergence is of practical significance for promoting the continuous development of campus media. The improvement of college students’ self-demands has put forward higher requirements for moral education and ideological and political work in the new era. It is urgent

to integrate some mainstream social trends and humanistic concepts into the connotation of moral education to make it richer and more complete<sup>[1]</sup>.

## **2. New media development promotes campus media innovation**

The rapid development of mobile Internet not only promotes the innovation of the network industry's structure but also has a profound impact on the current education industry. Campus media is the main way for higher education institutions to provide media services to the public. In the context of the development of mobile Internet, colleges and universities should pay attention to the changes in the Internet structure and actively improve their network infrastructure to lay a network foundation for the media convergence development of campus media. Campus media also constantly adapt to the development trends of social media. From the early emphasis on the construction of campus official websites and news websites to forms such as campus newspapers, campus radio, campus forums, Weibo, WeChat, and campus mobile clients, students can use the communication platforms provided by the school to communicate with society through the latest media forms. Campus media also keep pace with the times and continuously achieve their own development and progress. To some extent, the development of new media is not only a technological revolution in social media but also an opportunity and driving force for the continuous innovation of campus media.

While campus media are innovating in technology and form, their content and audience groups are also constantly changing. The traditional audience of campus media mainly consisted of teachers and students on campus. However, from the current development trend of campus media, the "campus" limitation of campus media is gradually being broken, and the audience groups are gradually expanding. They can be the surrounding social public, parents of students, or the broadest group of people interested in campus life and culture. The form of information release by campus media is also transforming from a single form to an interactive form, and comprehensive media content with both text and images is widely praised and applied. The media functions of campus media are constantly being strengthened. In the future, ideological and political education in colleges and universities must rationally introduce new media technologies and fully leverage the role of media in ideological and political education<sup>[2]</sup>.

## **3. Diversification of campus media innovation**

### **3.1. Promoting campus media through commercial platforms**

Compared with traditional campus media forms, new media forms have a wider audience and more advantages in technical support and network influence. Therefore, promoting and publicizing campus media through new media platforms has become a choice for many campus media. For example, many domestic campus media have opened their official accounts on Weibo and WeChat to enhance their influence in society and expand their audience base. As the number of followers on official Weibo and WeChat accounts continues to increase, the development space for campus media also expands. Not only in terms of form, content, and influence range, but also in terms of audience, new media forms can surpass traditional media. Campus media innovation also prioritizes new media commercial service platforms. Relevant research shows that when randomly selecting college students for a survey on internet usage habits, over 71% and 69% of students and teachers, respectively, use WeChat and Weibo as their main channels for obtaining information. Due to the integration of social and media functions, these two media forms can generate a broader influence. Weibo and WeChat have become the most influential media platforms on campus. Promoting campus media through commercial platforms can

achieve ideal promotion results.

### **3.2. Building new campus media platforms independently**

Although promoting campus media through commercial platforms like Weibo and WeChat can enhance their influence, it poses significant challenges for media management. To effectively manage the content of campus media platforms, many schools are actively attempting to build new media service platforms independently. By achieving technical and platform independence, they can enhance their management autonomy and ensure the quality of public information services provided by campus media. Currently, many schools are exploring diverse media development paths. On one hand, they release information through official accounts on Weibo and WeChat. On the other hand, they also promote their independent media platforms through campus mobile newspapers, mobile apps, and campus newspapers. To guide the application behavior of teachers and students and continuously enhance the influence of independent media platforms among them, they release summary information in campus newspapers. If teachers and students have an interest in the content, they can scan the QR code in the newspaper to access the campus media platform for in-depth reading. Journalists and editors should transform their thinking to the online era, create information content that meets the reading needs of the online audience, and enhance the application satisfaction of the audience, thereby promoting the continuous development of the independent platform.

### **3.3. Innovation of commercial products derived from campus media platforms**

Campus new media is not only the combination of the Internet and traditional campus media forms. In the application of new media awareness, it also deeply integrates new media technology with commercial services, transforming traditional campus media forms into commercial service forms, expanding the service scope of campus media, and creating commercial derivatives based on campus culture. Through the integration of campus media and commercial services, the commercial application value of campus media is enhanced. Supported by new media technology, the in-depth development of campus new media is promoted. Colleges and universities should strengthen the production and dissemination of innovative campus cultural content, organically integrating social hotspots, illustrations, real-time interaction, promotional titles, and content, cultivating brand awareness, and strengthening ideological education for college students <sup>[3]</sup>.

## **4. Effective approaches for campus media innovation**

The core issue of campus media innovation lies in its institutional attributes. Currently, the application subjects of campus media in Chinese universities are the campus publicity departments, while the main workers and managers are mostly staff from the administrative departments of the universities. The reform and innovation of campus media have become a common task for both the campus publicity departments and the administrative departments. However, due to the management system of the universities, the collaboration awareness among different departments is relatively poor, which will have a certain negative impact on the innovative development of campus media. At the same time, the innovation of campus media not only requires technical support but also needs to calculate the commercial cost, consider the application space and market demand, so as to effectively avoid the practical problems such as lack of funds, insufficient professional strength, unstable working teams, and lagging publicity and operation mechanisms during the innovation process. During the innovation process of campus media, relevant factors need to be fully considered, the conventional working state within the system should be changed, the innovation vitality should be expanded, and the flexibility

of the university management system and working forms should be increased to lay the foundation for the innovation of campus media. Compared with social enterprise media, the reform of campus media has a more complex environment. Campus media is not only affected by the campus management mechanism and policies, but also by the social environment and audience demands, which will also affect the reform and innovation process of campus media. Campus media needs to conduct a comprehensive analysis of its own attributes and comprehensively consider the complex external environment during the innovation process, analyze the challenges faced by media innovation and development, so as to ensure that campus media can actively improve and perfect itself in terms of infrastructure construction, policy support, team building, and model innovation.

#### **4.1. Strengthening the construction of campus network infrastructure**

Moral education and talent cultivation are the fundamental tasks of universities and the central link and key work of talent cultivation<sup>[4]</sup>. In recent years, with the continuous expansion of university enrollment, many universities have been expanding or building new campuses to meet the teaching and living needs of teachers and students. However, this has also led to the problem of inconsistent infrastructure between old and new buildings. Universities should invest more energy and resources in the construction of network infrastructure to ensure that the campus infrastructure is synchronized. Especially for old campuses, more funds should be invested to expand network bandwidth, improve the speed of campus network access, and expand the coverage of campus wireless networks, so as to meet the application needs of mobile terminal devices for teachers and students on campus to the greatest extent. The improvement of campus network infrastructure not only helps the development of campus media but also meets the basic needs of the transformation of modern education forms.

The construction of campus network infrastructure requires special funds for support and flexible management policies. It should not follow the lagging model of “planning first, then construction” in the traditional campus management system, but should adopt the new management and construction strategy of “developing, planning, adjusting, and constructing simultaneously,” and actively introduce commercial funds and technologies. By introducing social roles, the financial pressure on universities for the construction of campus network infrastructure can be alleviated, and the construction of campus networks can be vigorously promoted, providing a prerequisite for the development of campus media.

#### **4.2. Issuing and implementing policies for campus media innovation**

Campus media is not new, but its innovation and development in the context of media convergence can be regarded as novel. The management and operation system of traditional campus media can no longer meet the development needs of new campus media. The original policies and management systems lack consideration of new media forms and content. Therefore, relevant education departments and universities should attach importance to the development concepts of new media, actively improve relevant policies and management systems, and issue policies and management mechanisms conducive to the development of new campus media to support the new development of campus media in the macro environment. Although in 2013, the Ministry of Education and the Cyberspace Administration of China jointly issued the “Opinions on Further Strengthening the Construction and Management of University Networks,” providing guidance for the network construction and related management work in universities, the implementation of these guidelines in many universities has been far from satisfactory. To promote the innovative development of campus media, universities need to deeply interpret the relevant policies, break through the bottlenecks of the traditional management system, transform the functions of the school in campus management, enhance the service awareness of campus management,



apply “management methods” to serve “management content,” thereby effectively avoiding the disconnection between the management system and the management content, simplify the management review procedures and processes, and improve the efficiency and convenience of campus new media in conducting related work, thus promoting the further innovative development of campus media.

### **4.3. Building a professional work team for campus new media**

The related work of campus new media requires a professional team composed of talents with professional qualities. Currently, the work team of campus new media mainly consists of teachers, students, and administrative staff. Professional teachers have professional knowledge, but due to the influence of academic research and teaching activities, their energy and time are relatively limited, making it difficult for them to deeply participate in and carry out the construction and management of campus new media. Students’ participation in related work is mainly driven by personal interest, and due to factors such as exams and further education, there is a high degree of personnel mobility. Administrative staff can stably carry out related work, but they still have problems such as insufficient professional quality and a lack of innovation awareness. Therefore, building a high-quality new media work team is the key to promoting the development of campus new media. Relevant practical experience shows that the campus new media work team should establish a differentiated team structure and optimize and improve in three aspects of professional teachers, students, and administrative staff to enhance the professional quality and work level of the campus new media work team. From the perspective of professional teachers, more emphasis should be placed on the quality of their participation in campus new media platform work, not only providing theoretical guidance but also assisting in practical work. From the perspective of students, to ensure the stability of students’ participation in campus new media work, a system of senior students helping and connecting with junior students should be formed to ensure the effective connection of work content. From the perspective of administrative staff, on-the-job training and opportunities for in-service learning in new media should be provided to comprehensively enhance the professional quality of relevant staff.

### **4.4. Emphasizing the innovation of work models**

Campus new media is applied in the special teaching environment of universities. To highlight the characteristics of campus culture and enhance the innovation awareness of campus media, the work forms of campus media should also be actively transformed. Transformations and innovations should be made in aspects such as campus media promotion and the production of excellent campus media projects. Not only should the integration of campus media and network technology be achieved, but also the integration of campus new media and the audience. Project types and contents should be expanded in line with the actual needs of students, and the operation mechanism should be innovated. Crowdfunding methods can be used to lay the foundation for project establishment and production, such as crowdfunding for media content ideas, crowdfunding for venues, and crowdfunding for funds. Through crowdfunding, the enthusiasm of teachers and students to participate in campus new media can be enhanced, and the power of campus new media in promoting campus culture through network culture can be improved, highlighting the uniqueness of campus media. Ideological and political education is a process of helping students correct their thoughts and cultivate virtue. The content of ideological and political education in universities is complex and greatly influenced by external factors, requiring the construction of a comprehensive and collaborative education mechanism <sup>[5]</sup>. As an important part of the youth group, college students have a sacred responsibility in inheriting Chinese traditional culture. A

deep understanding of the connotation of traditional culture can help students have a higher respect for it and contribute to fostering their cultural confidence and national pride <sup>[6]</sup>.

All kinds of media within the campus of colleges and universities must actively integrate to enhance their working efficiency and dissemination efficiency, and provide better information for teachers and students <sup>[7]</sup>. Under the environment of media convergence, the innovation of campus media faces significant opportunities and challenges. Currently, the integration of campus media and new media in many schools is in a formalized state, leading to the gradual weakening of their media functions. Colleges and universities should reposition and evaluate the media functions of campus media, meet the multiple needs of modern college students' campus lifestyle and the development of modern higher education, reform and innovate their working forms and contents, and apply new media forms to enhance the application of campus media by teachers and students.

## Disclosure statement

The authors declare no conflict of interest.

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# Comparative Analysis of Educational Goals in Higher Education in Kazakhstan and China from the Perspective of Culture and Values

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**Abstract:** This study explores the cultural and value foundations of the educational goals of higher education in Kazakhstan and China. Based on the historical development and cultural traditions of the two countries, this study compares the similarities and differences of the educational goals of the two countries through qualitative literature content analysis. Both countries have taken “modernization and internationalization” as one of the core development directions of higher education development, but China’s educational philosophy is rooted in Confucianism and socialist core values, emphasizing country and collectivism; while Kazakhstan, based on neoliberal orientation, draws on the European education framework, gradually integrates multicultural concepts, emphasizes national identity and attaches importance to students’ individual development. This study uses Hofstede’s cultural dimensions and postcolonial education theory to explore how different nation-building narratives affect the educational goals of higher education. By comparing value systems, institutional logics, and student training models, it helps to understand how the educational systems of the “Global South” countries seek a balance between international standards and local cultural identity. It provides inspiration for the development of education based on culture and mutual reference under the global education trend, and provides a comparative education perspective for reform localization.

**Keywords:** Comparative education; Higher education reform; Educational philosophy; Student development; Cultural identity; Post-Soviet transition; Confucianism

**Online publication:** June 30, 2025

## 1. Introduction

In the context of global education reform, the phenomenon of global pressure and local traditions intertwined has become increasingly prominent. In particular, the higher education system in developing countries, as an important pillar of national soft power construction and social development, faces the challenge of reconciling international standards with local cultural value recognition<sup>[1]</sup>. As important countries in the “Belt and Road” initiative, Kazakhstan and China have launched large-scale education reforms in recent years, attempting to

improve the internationalization level of the national education system through institutional and conceptual innovation, so as to enhance competitiveness in the global market.

Although both countries emphasize the modernization and internationalization of education, their educational philosophies reflect different cultural and historical trajectories. China, based on Confucianism and the core socialist values, regards education as a tool to serve the country and cultivate morality. Kazakhstan, on the other hand, is in a post-Soviet transition period, while retaining some of the Soviet educational structure, it is transforming to a more open, diverse, and student-centered Western-style education system <sup>[2,3]</sup>.

This study aims to explore the similarities and differences in the educational goals of higher education in China and Kazakhstan, focusing on the following issues:

- (1) How do cultural and historical legacies shape the educational philosophies in the two countries?
- (2) In what ways do their respective student development goals reflect differing cultural logics?
- (3) What lessons can be drawn for culturally grounded education reform across the “Global South”?

## **2. Theoretical framework and methodology**

This study employs a cultural-comparative theoretical framework, drawing on:

- (1) Hofstede’s cultural dimensions theory <sup>[4]</sup> to understand differences in collectivism vs. individualism, power distance, and uncertainty avoidance.
- (2) Postcolonial education theory <sup>[1]</sup> to interrogate the implications of Western epistemologies on local educational values and systems.
- (3) Emerging scholarship on “Global South” education reform and identity-building <sup>[5,6]</sup>.

In terms of methodology, qualitative content analysis was used, and secondary academic literature, official university documents, public discourse, and policy-oriented academic writing were selected as data sources. The focus was on the expression of culture and values reflected in educational discourse and academic interpretations, and no direct analysis of the national policies of the two countries was conducted.

## **3. China: Confucian-socialist educational logic**

Chinese higher education is deeply rooted in traditional Chinese culture and modern political culture <sup>[7]</sup>. Influenced by the Confucian concept of “self-cultivation,” higher education is not only regarded as a process of imparting knowledge, but also as a process of cultivating individual moral cultivation, so that people can consciously cultivate behaviors that are in line with collective interests and social responsibilities in actual actions.

Looking at contemporary China, “moral education” has long been a core concept repeatedly emphasized in the field of education. It not only focuses on the shaping of individual character, but also deeply reflects China’s expectations for future citizens to undertake national missions and continue national rejuvenation. This value orientation runs through every detail of higher education. For example, colleges and universities have always emphasized the importance of knowledge, skills, and ideology. They generally use systematic courses and centralized education management models with Chinese characteristics, as well as a narrative system that shapes the youth of the new era as national mission bearers, to continuously consolidate students’ national identity and sense of responsibility. On the one hand, this educational logic carries forward China’s profound cultural traditions, and on the other hand, it responds to China’s urgent need for high-quality talents with all-round development in the new era.

It can be seen that China’s educational goal focuses on cultivating students with all-round development in morality, intelligence, physical fitness, aesthetics, and labor. By giving equal importance to academic literacy and

value guidance, the education system strives to shape a new generation of successors who have both professional capabilities and are loyal to the country and social mission. This training model embodies the educational logic with Chinese characteristics, which combines knowledge with faith and personal growth with national needs.

#### 4. Kazakhstan: Post-Soviet pluralism and global orientation

Kazakhstan’s higher education reform reflects a different historical and cultural trajectory. Since independence in 1991, Kazakhstan has gradually moved away from the centralized Soviet education model and widely absorbed Western experience, with multicultural citizenship and identity diversity established as core training goals <sup>[2]</sup>.

The decentralization of higher education has given universities greater governance autonomy and academic freedom, which has not only improved the internal governance efficiency of higher education institutions but also provided more favorable institutional guarantees for them to participate in international competition and achieve innovation in teaching and scientific research <sup>[8–10]</sup>. For example, universities in Kazakhstan have gradually begun to promote the use of Kazakh, Russian, and English in teaching, which not only improves students’ language skills but also lays the foundation for their integration into a multicultural exchange environment. At the same time, universities have actively responded to the country’s innovation-driven development strategy, incorporated entrepreneurship and innovation into teaching courses, focused on integrating with practice, and emphasized cultivating students’ practical ability and innovative thinking. In the process of focusing on the individual development of students, the education system also emphasizes the shaping of students’ awareness of cultural tolerance, encouraging them to achieve self-growth and expand their global vision in respecting diversity.

Overall, Kazakhstan has actively improved the adaptability of education through the three paths of decentralized governance, cultural diversity, and innovation orientation, built a higher education system that is in line with international standards while taking into account local characteristics, and vigorously cultivated innovative talents who understand and respect different cultural traditions and value systems and have a global vision and cross-cultural communication capabilities.

### 5. Comparative analysis

#### 5.1. Educational values and educational objectives

From **Table 1**, we can see that there are significant differences in the values of higher education between China and Kazakhstan. From the perspective of the value system, based on the different cultural foundations of the two countries, China’s educational philosophy revolves around “educating people for the country,” aiming to cultivate new people of the era who are loyal to the country and shoulder the great task of national rejuvenation; Kazakhstan’s educational philosophy is more inclined to the individual development of students, with the ability of diversity and inclusion, and aims to cultivate new youth with “global learning ability.”

**Table 1.** Comparison chart between China and Kazakhstan

Dimension	China	Kazakhstan
Cultural foundation	Confucianism, socialism	Nomadic culture, Post-Soviet identity
Student development goals	Moral agents, national contributors	Citizens with rights, global learners
Emphasis	Collectivism, loyalty, moral education	Individualism, critical thinking, innovation
Educational goals	State service, ideological alignment	Employability, diversity, personal growth



## 5.2. Governance and internationalization

China's higher education governance emphasizes a top-down strategy, with overall planning by the state and implementation by institutions. It is a "selective globalization" based on Confucian cultural confidence. Kazakhstan is more open to international education standards, with universities having more autonomy, and actively promoting the Bologna reform, international quality assurance benchmarks, and English teaching system<sup>[3]</sup>.

China is cautious and strategic in absorbing global elements, focusing on introducing various resources and its own culture to "go global." Kazakhstan adopts a more liberal internationalization model, focusing on integrating into the European education system and cultivating students with a global perspective.

## 6. Future and challenges

Based on the above comparison, it is not difficult to see that, combined with the current "China's footsteps," in the future, China's education goals will be more inclined towards scientific and technological innovation and cross-domain capabilities, and will further combine "Chinese achievements" with internationalization. However, maintaining the leading position of educational achievements among many global competitors will become a challenge. Kazakhstan will further strengthen academic freedom and drive innovation according to industry needs. As education reform continues, how to find its own development path in the global education competition and knowledge sharing will also become a major challenge for Kazakhstan.

## 7. Mutual learning and the influence of the "Global South" countries

In the development of educational modernization and internationalization, although the two countries have different educational goals, they face similar problems. As Tikly warns, global educational reforms often carry implicit Eurocentric assumptions that marginalize local values<sup>[1]</sup>. So, how to promote educational modernization without sacrificing their own cultural identity?

Perhaps China could try to draw inspiration from Kazakhstan's experience in curriculum flexibility and multicultural inclusion; Kazakhstan could also learn from China's successful experience in long-term education strategy and cultural roots. Whether international or local, the fundamental task of university education should be to enhance the competitiveness of local culture. Therefore, more attention should be paid to the "dual guidance" of local culture and international culture<sup>[11]</sup>.

For the countries in the "Global South," this comparison shows that in the process of seeking modernization and international development in education reform, they should avoid blindly copying the education model of Western countries. Instead, they should reasonably combine the local knowledge system according to their own actual conditions and formulate an education development path that can empower rather than replace cultural identity. This is the way to long-term development.

## 8. Conclusion

Education is never culturally neutral. This study reveals the cultural roots and value integration model behind educational goals. As shown in this study, the higher education goals of Kazakhstan and China are deeply rooted in their respective cultural traditions and value orientations. Modernization and nationalization under educational reform should be understood as a process of intersection and reshaping of cultural identity. Based on the autonomous construction of "future education" on the basis of local culture, enjoy the collision of thoughts brought about by multicultural exchanges, take the essence of it, integrate it into oneself, grow in

mutual learning, expand international vision in local reflection, and adhere to the path based on local values.

In summary, comparative education research not only helps us better understand others but also prompts us to re-understand the cultural logic and future direction of our own educational development. In the current era of “South-South comparison,” this is also the modern sex education issue that all countries in the “Global South” face in common.

## Disclosure statement

The authors declare no conflict of interest.

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# Educational Mechanism of Curriculum-Based Political and Ideological Education in Vocational Colleges under the Background of New Quality Productivity

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**Abstract:** The development of new quality productivity has set new requirements for vocational education. Vocational colleges need to integrate ideological and political education into professional courses to cultivate high-quality talents with both technical capabilities and political literacy. This paper analyzes the connotation of new quality productivity and its reshaping of vocational education, explores the challenges faced by the educational mechanism of Curriculum-based Political and Ideological Education (CPIE), and proposes a “three-dimensional synergy” practical pathway. That is, to effectively promote CPIE through three dimensions: the deep integration of cases with professional content, the enhancement of teaching effects using digitization, and the optimization of the course evaluation system. It aims to provide theoretical support and practical references for the reform of ideological and political education in vocational colleges.

**Keywords:** Educational mechanism; Curriculum-based political and ideological education; New quality productivity; Vocational education

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## 1. Introduction

### 1.1. Research background

Against the backdrop of the continuous deepening and development of the socialist educational system with Chinese characteristics in the new era, vocational education, as an important front for cultivating high-quality technical and skilled talents, is facing unprecedented opportunities and challenges. With the rapid development of new quality productivity characterized by digitization and intelligence, the societal requirements for the qualities of technical talents have shifted from mastering a single skill to enhancing comprehensive qualities. In particular, talents with both moral integrity and technical expertise, who possess a firm political stance



and correct value orientation, are in high demand in this era. Vocational education is gradually transforming from a “skill-oriented” approach to a “morality cultivation and talent development” approach. Curriculum-based Political and Ideological Education (CPIE), as an important pathway to achieve this goal, is increasingly highlighting its strategic significance and practical urgency. However, current vocational colleges still encounter problems such as conceptual deviations, a lack of mechanisms, and a disconnection from practice in the process of organically integrating political and ideological education into professional courses. There is an urgent need to construct a systematic and collaborative talent cultivation mechanism to address these issues. Therefore, an in-depth exploration of the internal logic and implementation pathways of CPIE in vocational colleges under the background of new quality productivity not only holds significant theoretical value but also has far-reaching practical implications for promoting the high-quality development of vocational education.

## **1.2. Main research content**

This paper focuses on the profound transformational demands placed on vocational education by the development of new quality productivity, analyzing its connotations, characteristics, and its reshaping effect on talent cultivation models. Based on this analysis, the paper explores the practical dilemmas and major challenges faced by the current CPIE mechanism. By reviewing existing theoretical achievements and practical experiences, the article proposes a practical pathway centered on “three-dimensional synergy,” namely, achieving effective advancement of CPIE through three dimensions: the deep integration of cases with professional content, leveraging digitization to enhance teaching effectiveness, and optimizing the curriculum evaluation system. The aim is to provide theoretical support and practical guidance for vocational colleges in constructing a scientific and reasonable ideological and political education system.

## **2. Literature review**

### **2.1. Related research on new quality productivity**

As the core driving force behind modern economic development, the connotation and impact of new quality productivity have gradually become the focus of academic attention. Wang and Zhang <sup>[1]</sup> pointed out that the development of new quality productivity not only provides new opportunities for high-quality and full employment of the workforce but also promotes socio-economic progress by optimizing industrial structure and labor allocation. Wang <sup>[2]</sup> explored the mechanism by which new quality productivity drives high-quality economic development, emphasizing the pivotal role of the tax system in resource allocation and interest balancing. Xu *et al.* <sup>[3]</sup> further demonstrated that new quality productivity is not only an important engine for economic growth but also a key factor in achieving green wealth growth, significantly enhancing environmental benefits through energy conservation and emission reduction effects. Ren *et al.* <sup>[4]</sup> focused on new quality productivity in the marine sector, analyzing its unique characteristics and development trends, and proposed specific strategies to promote the marine energy revolution and digital transformation. Tian and Yi <sup>[5]</sup> utilized the TOE theory to explore the driving pathways of technological innovation in strategic emerging industries on new quality productivity, revealing the interaction mechanism among technological, organizational, and environmental factors. Zhan and Luo <sup>[6]</sup>, starting from the concept of shared development, discussed how technological innovation can facilitate the development of new quality productivity to meet the people’s growing needs for a better life.

## 2.2. Historical evolution of vocational education and CPIE

In recent years, with the advancement of educational digitization and the increasing demand for the value of technical and skilled talents in society, CPIE in vocational education has gradually become a research hotspot. Wang<sup>[7]</sup> explored new pathways for the construction of CPIE in vocational education under the background of educational digitization, emphasizing the integration of ideological and political thinking with technological thinking, as well as the utilization of digital technologies to enrich course content and governance models, thereby enhancing the practical effects of CPIE in vocational education. Kang and Tian<sup>[8]</sup> proposed the concept of “micro-ideological and political education,” arguing for its advantages in being life-oriented, permeable, and interactive, and provided five implementation pathways for public foreign language courses, including selecting micro-content and creating micro-platforms. Guo and Zhu<sup>[9]</sup> pointed out that CPIE in current vocational education faces the contradiction between the expansion of instrumental rationality and the decline of value rationality, suggesting that the function of value shaping should be strengthened through the construction of educational logic to achieve the fundamental task of cultivating people with morality. Kong *et al.*<sup>[10]</sup>, through teaching exploration in the pharmaceutical analysis course in higher vocational colleges, demonstrated how to integrate ideological and political elements into professional course content, innovate teaching methods, and establish an assessment mechanism to ensure the evaluability and measurability of the educational effects. Zhou and Zhang<sup>[11]</sup>, targeting the characteristics of the art and design major in higher vocational colleges, proposed multiple strategies, including constructing a guarantee mechanism, improving top-level design, and enhancing teachers’ capabilities, aiming to address the existing problems in the current construction of CPIE and effectively implement the goal of cultivating people with morality. These studies indicate that CPIE in vocational education not only requires theoretical support but also needs practical innovation combined with the characteristics of specific disciplines to comprehensively enhance students’ comprehensive qualities.

## 3. Challenges faced

### 3.1. New quality productivity imposes higher requirements on vocational education

The development of new quality productivity has set unprecedentedly high standards and new requirements for vocational education. With the widespread application of emerging technologies such as digitization and intelligence, the demand for high-quality technical and skilled talents in society has shifted from a singular focus on technical capabilities to a comprehensive enhancement of overall qualities, particularly the cultivation of political literacy and social responsibility<sup>[1]</sup>. However, the current vocational education system faces numerous challenges in responding to this transformation. For instance, the curriculum fails to promptly reflect the demand changes brought about by technological advancements, making it difficult for students to adapt to the rapidly evolving industry environment in their future careers. Therefore, how to adjust the content of vocational education to meet the requirements of new quality productivity has become an urgent issue to be addressed.

### 3.2. The phenomenon of emphasizing skills over moral education still persists

Although the concept of “cultivating both moral integrity and technical expertise” has gradually gained traction in recent years, the phenomenon of “emphasizing skills over moral education” still prevails in actual teaching processes. Many vocational colleges tend to place greater emphasis on imparting professional skills when formulating talent cultivation plans, while neglecting the education of students’ values and social responsibility. For example, Guo and Zhu<sup>[9]</sup> pointed out that CPIE in current vocational education faces a dual contradiction between the expansion of instrumental rationality and the decline of value rationality. This not only hinders

students' comprehensive development but also undermines the fundamental task of cultivating people with morality. Therefore, it is imperative to strengthen moral education to ensure that every graduate possesses good professional ethics and a sense of social responsibility.

### **3.3. Disconnection between CIPE**

Although an increasing number of vocational colleges have begun to attach importance to CIPE, there is still a problem of disconnection between course content and ideological and political elements in the specific implementation process. Some schools, despite offering specialized ideological and political courses, fail to effectively integrate them with other professional courses, resulting in ideological and political education becoming a mere formality. Kang and Tian<sup>[8]</sup> proposed that the permeability and interactivity of ideological and political education could be enhanced by selecting micro-content and creating micro-platforms, enabling ideological and political elements to be naturally integrated into daily teaching activities. Meanwhile, Ren *et al.*<sup>[4]</sup> believed that it is necessary to target the development needs of new quality productivity in specific fields, optimize curriculum design, and ensure that ideological and political education complements the imparting of professional knowledge, jointly promoting students' comprehensive growth.

## **4. Practical pathways**

### **4.1. Integration of ideological and political case development with professional content**

To effectively promote CIPE, it is imperative to ensure that the development of ideological and political cases is closely aligned with professional content. By skillfully integrating ideological and political elements into the teaching of professional courses, not only can students' theoretical knowledge be enhanced, but also their moral literacy and sense of social responsibility can be improved<sup>[9]</sup>. For instance, in the pharmaceutical analysis course, Kong *et al.*<sup>[10]</sup> demonstrated how to reconstruct teaching content based on projects and tasks, and determine the main line of ideological and political education, so that the imparting of professional knowledge and ideological and political education complement each other. This approach not only enriches teaching resources but also allows students to naturally receive the influence of ideological and political education during the learning process, achieving a dual enhancement of knowledge, skills, and values.

### **4.2. Enhancing the integration effect of ideological and political cases through digitization**

Digital technology offers new opportunities for CIPE, significantly enhancing the integration effect of ideological and political cases with professional content. Wang<sup>[7]</sup> emphasized the importance of CIPE construction in vocational education under the background of educational digitization, pointing out that the use of digital technology can not only enrich course content but also optimize teaching governance models. By constructing a nationwide collaborative network and expanding the discourse influence of CIPE, ideological and political concepts can be more effectively disseminated, promoting students' understanding and internalization of ideological and political content. In addition, digital means such as virtual simulation and online interactive platforms also provide teachers with more possibilities for innovative teaching methods, thereby enhancing the practical effects of ideological and political education.

### **4.3. Optimizing the course evaluation system**

To ensure the effective implementation of CIPE, it is necessary to optimize the existing course evaluation system. Traditional evaluation methods often focus on students' knowledge mastery while neglecting the

assessment of their values and comprehensive qualities. Therefore, establishing a scientific and reasonable evaluation mechanism is crucial. Kong *et al.*<sup>[10]</sup> proposed constructing an evaluation mechanism for ideological and political literacy to make the educational effects of CPIE evaluable and measurable. This not only helps to provide timely feedback on teaching effects but also encourages teachers to continuously improve their teaching methods and enhance teaching quality.

## 5. Conclusion

Under the background of new quality productivity, the construction of a CPIE mechanism in vocational education is not only a key measure to meet the demand for high-quality technical and skilled talents in the new era but also an important direction for deepening educational reform. Through practical pathways such as developing ideological and political cases closely centered around professional content, enhancing the integration effect through digital means, and optimizing the course evaluation system, the implementation of CPIE can be effectively promoted, facilitating students' comprehensive development. However, achieving this goal still requires continuous exploration and innovation to ensure the close integration of theoretical research with practical operation, providing vocational colleges with feasible guidance plans. Future research should further focus on the challenges and solutions in the specific implementation process to continuously improve and enhance the quality and effectiveness of vocational education.

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# Empirical Study on Patriotism Films and College Students' Party History Identity

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**Abstract:** Patriotism education films and television serve as both historical preservers and educational tools, yet the audiovisual acceptance-party history identity relationship remains understudied. Using SPSS-Amos to analyze 442 student surveys through structural equation modeling, this study reveals that audiovisual acceptance significantly enhances film reception, which in turn strengthens Party history identification and viewer satisfaction, demonstrating these media's dual capacity to foster historical consciousness and patriotic values among students.

**Keywords:** Patriotism education film and television (PEFT); Ideological and political education; Audience satisfaction; Party history; Sense of identity

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## 1. Introduction

The General Secretary emphasized that red resources are invaluable spiritual treasures. As the cornerstone of China's mainstream film genre, patriotism education films and television (PEFTs) hold a core position in multiple aspects and can promote red culture. Relevant planning documents and opinions stress the need to produce outstanding works that celebrate the Party, the country, the people, and heroes, so as to carry forward the red gene. This article aims to explore the impact of the acceptability of the audiovisual space in PEFTs on field research intentions, with the goal of providing practical suggestions for promoting the inheritance and dissemination of red culture.

## 2. Literature review

### 2.1. Sense of identity

Identity is an emotional and conscious sense of belonging in social life. Party history identity is the national inner identification with the history of the Communist Party of China, i.e., self-identity, the party's spiritual and cultural identity, and emotional identity. Zheng<sup>[1]</sup> pointed out that audiovisual space can influence the audience's emotional

resonance and ideological identity. Wang and Meng <sup>[2]</sup> started from the internal logic of government governance innovation and national identity, and argued that good government governance innovation helps nationals enhance their national identity. Yuan <sup>[3]</sup> revealed that an individual's education level is significantly and positively related to national identity. To a certain extent, this highlights that people's identity is inseparable from national strength.

In order to enhance the national identity of nationals, many scholars have made suggestions and analyzed groups in different age groups and environments from the perspectives of modern network media, governmental governance means, and education level, which provide references for this article to explore college students' sense of identity with Party history from the perspective of patriotism education films and TVs.

## **2.2. Audiovisual space**

Marshall McLuhan, the founder of the media environment school, believed that audiovisual artworks often consist of real space and virtual space. Real space is a mirror reflection of the objective world, and virtual space refers to the electronic space in which the user produces a sense of space similar to or close to physical space. Liang and Wang <sup>[4]</sup> hoped to realize the innovation of China's cultural heritage in audiovisual creation by "the third time and space," and to enhance cultural confidence. Chang and Li <sup>[5]</sup> critically discussed the role of streaming media in contemporary audiovisual culture. He and Wang <sup>[6]</sup> attempted to mutually empower audiovisual art and urban economy from a reflexive perspective.

Scholars have focused their research on audiovisual spaces to promote the establishment of cultural communities and cultural innovation. Recent studies have focused on the use of audiovisual spaces to disseminate traditional culture and empower regional economies, providing new perspectives on socio-economic and cultural development.

## **3. Research design**

### **3.1. Theoretical assumptions and research models**

This study examines patriotism education through film and television acceptance, focusing on four dimensions: entertainment, education, stress relief, and aesthetics. Audiovisual space acceptance is treated as the independent variable, with satisfaction and party history identity as dependent variables, to explore their interrelationships and impact on satisfaction. This hypothesis is grounded in the following rationale:

- (1) Communication media's fundamental characteristic is its audiovisual duality, evoking emotional responses. Extending the Stimulus-Organism-Response (SOR) theory to patriotic education films, sensory experiences in the audiovisual space (stimulus) lead to emotional evaluation (organism) and acceptance of the content (response). This framework supports the hypothesis that audiovisual space acceptance fosters receptiveness to patriotic education films, strengthening party history identification.

Hypothesis 1: Audiovisual space acceptance leads to patriotism education film acceptance, increasing party history identity acceptance.

- (2) Film and television carry profound cultural connotations, stimulating patriotic feelings and national pride. Applying the SOR theory, patriotic feelings stimulated by the audiovisual space can improve college students' party history identity acceptance, indicating a positive effect on party history identity.

Hypothesis 2: Audiovisual space stimulates patriotic feelings and has an educational dimension, improving party history identity acceptance.

- (3) Patriotism education films' war or oath clips have a visual impact, releasing repressed emotions and expanding positive emotions, thus increasing party history identity and acceptance.

Hypothesis 3: Audiovisual space reception produces satisfaction, which in turn fosters party history identity.

- (4) The audiovisual space's attraction strengthens the patriotism education films' appeal, increasing acceptance and satisfaction. Feng *et al.* <sup>[7]</sup> found that organizational identification and job satisfaction are positively correlated, suggesting that satisfaction positively affects identification.

Hypothesis 4: Audiovisual space acceptance leads to patriotism education film acceptance, enhancing satisfaction and party history identity.

These points suggest that audiovisual space acceptance in patriotism education films encompasses entertainment, education, stress relief, and aesthetic dimensions, enhancing satisfaction and party history identity.

### **3.2. Scale design and data sources**

The research questionnaire had 46 questions in two parts: basic respondent information and their judgments. The latter covered entertainment, education, stress relief, aesthetic, audiovisual space acceptance, satisfaction, and Party history identification dimensions. Distributed electronically on October 31, 2023, it got 442 responses by January 11, 2024.

## **4. Empirical analysis**

### **4.1. Reliability and validity analysis tests**

Reliability, a quantitative indicator of the internal consistency of a scale, is an important analytic measure of the reliability of a sample's responses. After analyzing, the total scale and the reliability coefficients of each variable in this study are over 0.9, indicating that the questionnaire has good reliability and is suitable for subsequent validation.

Validity, which reflects a scale's accuracy in measuring a specific trait, comprises two main aspects: content validity and construct validity. The questionnaire questions were designed based on established academic models, with modifications tailored to the study's scope and purpose to ensure content validity. Construct validity was assessed through factor analysis, focusing on correlations among factors. The factor analysis revealed KMO values above 0.8 and factor loadings exceeding 0.5 for all scales, indicating excellent construct validity and suitability for subsequent hypothesis testing.

### **4.2. Correlation analysis test**

According to correlation analysis, the test demonstrates the means and standard deviations of the different variables and the correlations between them. These variables include entertainment dimension, educational dimension, stress release dimension, aesthetic dimension, audiovisual space acceptance, satisfaction, and party history identity.

There is a positive correlation between the acceptance of patriotism education films and television and the acceptance of audiovisual space, between satisfaction, and between identification with party history. In the study of Chinese movie audience satisfaction, Xue and Li <sup>[8]</sup> concluded that there is a positive correlation between movie and TV acceptance and satisfaction, and Luo and Yang <sup>[9]</sup> suggested that college students are influenced by patriotism education films and TVs when they watch them, so as to construct their sense of national collective identity. The data in this paper are within the scope of their research results, so there is a significant positive correlation between the acceptance of patriotism education films and television and the acceptance of audiovisual space, satisfaction, and the sense of identity with party history.



There is a significant positive correlation between the acceptance of audiovisual space and satisfaction, and the sense of identification with Party history; as Li said, the skillful integration of audiovisual space in film and television can trigger the audience's "strong resonance" <sup>[10]</sup>, and improve the audience's acceptance and recognition. This shows that the data in this paper is consistent with previous research, and that there is a positive correlation between the acceptance and satisfaction of the audiovisual space and the sense of identification with party history.

There is a significant positive correlation between satisfaction and party history identity. From the perspective of museum tourism, it is concluded that satisfaction has a significant positive effect on cultural identity <sup>[11]</sup>. This indicates that there is a positive effect between satisfaction and party history identity, and the data in this paper has credibility in the research results in this field.

### 4.3. Regression model testing

Gender, region, hometown, major, grade, and audiovisual space acceptance were taken as independent variables, and PEFTs acceptance was taken as the dependent variable for linear regression analysis. According to the model formula, it is known that the model  $R^2$  value is 0.773, which indicates that all the independent variables can be used as a reason for 77.3% of the change in the acceptance of PEFTs. Because the model passes the  $F$ -test ( $F = 246.452$ ,  $P = 0.000 < 0.05$ ), it indicates that at least one of the independent variables will have an influential relationship on PEFTs acceptance.

The test of multiple covariates of the model found that the VIF values in the model are all less than 5, so there is no covariance problem; and the D-W values are around the number 2, indicating that the model is not autocorrelated, and no correlation between the sample data. This indicates that audiovisual space acceptance will have a significant positive influence on PEFTs acceptance, which is in line with the prediction results.

Likewise, we can derive that the audiovisual spatial acceptance produces a significant positive impact on satisfaction, which is in line with the predicted results.

The final summary analysis shows that audiovisual space acceptance will have a significant positive influence on satisfaction, PEFTs acceptance. Furthermore, PEFTs acceptance and satisfaction will also have a significant positive influence on party history identity; however, gender, region, hometown, specialty, grade, and audiovisual space acceptance will not influence party history identity.

## 5. Conclusion

The thematic settings of patriotic education films and cultural bases can immerse college students, evoking their emotional resonance. The impact of these films and the benefits of field study complement each other, strengthening students' ideals, beliefs, and sense of mission. They also cultivate a profound patriotic spirit and the qualities of bravery, fearlessness, selflessness, and unity inspired by the films.

To enhance participation and satisfaction in both film production and field study initiatives, we should prioritize creating a compelling audiovisual environment. In filmmaking, leveraging modern technologies like high-definition visuals, realistic sound, and precise editing can craft an immersive cinematic experience. Scriptwriting and character development should focus on emotional depth and authenticity, allowing viewers to connect deeply with the film's message and emotions. Such films will not only engage college students but also foster a strong sense of empathy and involvement, boosting their acceptance and enjoyment.

For field study activities, aligning them with students' professional backgrounds and interests is crucial. Using AI or AR to design activities that resonate with their daily lives can make study tours more relevant and

practical. This approach enhances student participation and satisfaction, facilitating the transmission and growth of a patriotic education culture. Through these strategies, we can effectively engage college students in patriotic education, fostering a deeper understanding and appreciation of their national heritage.

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# Generative Artificial Intelligence Empowering Foreign Language Education and Teaching Reform: Mechanism, Risk, and Response

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**Abstract:** The rapid development of generative artificial intelligence (GenAI) is profoundly changing the form and paradigm of foreign language education. GenAI technology, represented by DeepSeek, provides technical support for personalization, immersion, and intelligence of foreign language teaching by virtue of its natural language processing, multimodal content generation, and cross-cultural simulation capabilities. From the three dimensions of “teaching reconstruction,” “learning innovation,” and “education upgrading,” this paper systematically analyzes the internal mechanism of GenAI empowering foreign language education and reveals its unique value in language knowledge transmission, skill training, and cultural understanding. At the same time, considering that GenAI may lead to language model errors in foreign language education, cultural misinterpretations, technological dependence, and data privacy risks, it is proposed to adopt coping strategies such as building an advanced literacy system, establishing a human-AI collaborative ecosystem, and implementing a transparent regulatory framework for algorithms. These measures aim to ensure the high-quality development of technology-integrated foreign language education, providing both theoretical support and practical pathways for cultivating globally competent talents with intercultural communication skills and digital literacy.

**Keywords:** Generative artificial intelligence; Foreign language education; Language skills; Intercultural communication; Technology risk

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## 1. Introduction

In recent years, generative artificial intelligence (GenAI) technology has made remarkable progress and is revolutionizing the global education landscape. As an important field in cultivating intercultural communication competence, foreign language education is of great significance for promoting national cultural confidence and cultivating international communication talents. However, for a long time, foreign language teaching has been facing challenges such as static teaching content, one-way learning methods, and superficial cultural

understanding. Traditional teaching methods are difficult to meet learners' needs for personalized language practice, instant interactive feedback, and in-depth cultural experience <sup>[1]</sup>. Artificial intelligence technology represented by DeepSeek provides new ideas for solving the problems in foreign language teaching by constructing dynamic knowledge networks, realizing multi-modal interaction, and strengthening reasoning ability. DeepSeek technology can simulate the actual dialogue situation, design customized exercises in line with learners' language ability, and use a visual thinking chain to help grammar analysis, which effectively improves the teaching effect.

However, existing studies mostly focus on the application of GenAI in general educational scenarios, and less in-depth discussion on its special impact on foreign language education. Foreign language education involves a complex process of language skill acquisition, cultural cognitive construction, and communication competence cultivation. The application of GenAI should take into account both technical adaptability and educational humanism, so as to promote learners' mastery and understanding of language and culture. Mechanism of the present study has the following deficiencies: first, analysis of the lack of pertinence, not the combination of foreign language teaching and language acquisition law (e.g., the input hypothesis, communicative teaching method). Second, risk identification does not highlight the particularity of foreign language education, such as the reinforcement of grammatical errors in language models and the spread of cultural stereotypes. Third, the coping strategies fail to integrate the linguistic theory and the technological governance framework. Based on this, this paper systematically analyzed the internal mechanism, potential risks, and governance paths of generative artificial intelligence empowering foreign language education, so as to provide a theoretical reference for the transformation of foreign language education in the era of intelligence.

## **2. The internal mechanism of GenAI empowering foreign language education**

Generative AI reconstructs the ecological chain of “teaching-learning-education” in foreign language education through the closed-loop mechanism of “content generation-scene interaction-cognitive iteration.” This closed-loop mechanism of “perception-decision-reconstruction” not only improves the accuracy of language input and the practicality of output, but also promotes the reform of talent training mode through technical tools <sup>[2]</sup>. It promotes the transformation of the education paradigm from experience-driven to empirical-driven.

### **2.1. Teaching reconstruction: From standardized mode to personalized language training**

#### **2.1.1. Dynamic adaptation of teaching content**

The traditional teaching model, which relies on standardized materials, a unified teaching plan, and a fixed outline to guide instruction, allows teachers to provide differentiated feedback and guidance to learners at various levels. However, due to constraints such as rigid teaching schedules and other institutional factors, the implementation of truly personalized teaching strategies for individual learners remains far from fully realized. In contrast, GenAI can dynamically schedule language skill modules (such as grammar parsing, pronunciation correction, vocabulary expansion) through the MoE (Mixture-of-Experts) architecture to achieve the accurate adaptation of teaching content. In French, for example, DeepSeek can detect real-time syntax errors in analytical writing, based on language model generation error correction advice. For those with weak spoken language, DeepSeek provides pronunciation demonstration and automatic pronunciation correction by combining speech recognition and speech synthesis technology. This dynamic adaptation breaks through the fixed content framework of traditional teaching and makes it possible to teach students in accordance with their aptitude. Based on the data statistics and intelligent feedback technology, DeepSeek can also, according to the learner's



progress speed and point of interest, adjust the difficulty of teaching contents and depth in real time, to ensure that every learner can get the best learning experience at their own pace.

### **2.1.2. Ternary synergy in teaching mode**

The traditional classroom takes “teacher-learner” as the core of the dual structure. In the era of artificial intelligence, the “Teacher-AI-Student” Triadic Collaboration Model integrates the advantages of teachers, AI, and learners. AI is introduced as an intelligent agent to form a dynamic collaborative teaching-learner system. Its core goal is to enhance teachers’ teaching effectiveness, reduce repetitive work burden, and improve the quality of teaching design. Optimizing learners’ learning experience and providing personalized and immediate feedback interactive environment. The technical advantages of AI were used to provide accurate support in knowledge transfer, training enhancement, and learning situation analysis. Under the “teacher-machine-student” collaborative framework, GenAI plays the role of virtual language tutor, and teachers can automatically generate cross-cultural dialogue scripts and design task-based teaching activities with the help of artificial intelligence technology. Learners can get immediate feedback through multiple rounds of interaction<sup>[3]</sup>. This model not only improves the interactivity of the classroom but also enables teachers to focus more on the individual needs of learners, so as to achieve more accurate teaching.

### **2.1.3. Multi-dimensional deepening of teaching evaluation**

Teaching evaluation is an important link to improve teaching quality, promoting the development of learners’ learning. GenAI, using technologies such as natural language processing and large data, can achieve the language ability of multidimensional evaluation. In terms of teaching evaluation, based on natural language processing and machine learning technology, GenAI can better achieve subjective essay scoring and give learners personalized feedback. For example, in foreign language writing assessment, DeepSeek can target vocabulary richness—not only increasing word variety and accuracy, but also enhancing grammatical precision. It can further analyze sentence fluency, logical coherence, topic relevance, native-like expression, and creative aspects of writing. On one hand, this significantly reduces the workload of teachers. In addition, DeepSeek can also provide teachers with comprehensive evaluation reports covering language form and communication function. The diversity of teaching evaluation can not only help teachers to fully understand learners’ learning status and adjust teaching strategies in time, but also stimulate learners’ learning enthusiasm and provide a basis for setting learning goals and adjusting learning strategies.

## **2.2. Learning innovation: From passive input to immersive language practice**

### **2.2.1. Construction of multimodal immersive environment**

Generative artificial intelligence integrates text, speech, video, and virtual reality (VR) technologies to construct highly simulated language usage scenarios and provide immersive learning experiences for foreign language learners. Taking Spanish teaching as an example, GenAI is able to generate a simulated Spanish market scenario based on a 3D virtual environment, in which learners can engage in bargaining interactions with virtual vendors. This interaction not only trains learners’ listening comprehension and oral expression skills, but also enables learners to learn cultural taboos in practice, such as social distancing norms in Latin American countries. The application of an immersive learning environment greatly improves the interest in learning, enhances the practical application ability of learners, and enables them to use the language knowledge they have learned in a real context.



### **2.2.2. Design of an autonomous learning path**

Based on the reinforcement learning algorithm, GenAI can plan personalized learning paths for foreign language learners. By analyzing learners' learning behavior data, such as learning duration, answer accuracy, and frequency of visits to different knowledge points, GenAI can customize the learning plan for each learner. For beginners of Japanese, GenAI can provide kana reading exercises to help them lay the foundation; and for advanced learners, they can enter the advanced practice of “news listening translation-opinion debate” to improve learners' language ability through practical language application tasks. The system will dynamically adjust the difficulty of learning tasks according to the learner's completion degree to ensure that learners are always at a moderate challenge level, so as to make continuous progress at their own pace <sup>[4]</sup>.

### **2.2.3. Visual feedback on learning effectiveness**

GenAI converts the growth trajectory of language ability into a visual graph to provide intuitive learning effect feedback for learners and teachers. For example, for German learners, DeepSeek can present indicators such as “grammar mastery” and “communicative fluency” in the form of dynamic dashboards. This visual map not only gives learners an intuitive sense of their progress but also helps them locate weak areas so that they can optimize their learning strategies. At the same time, teachers can track learners' learning progress more effectively through these visualization tools, find the problems encountered by learners in the learning process in time, and provide targeted help. The feedback mechanism of learning effect visualization not only improved the transparency of learning but also enhanced learners' learning motivation, so that they could participate in the learning process more actively.

## **2.3. Educational upgrade: From language skills to cross-cultural literacy**

### **2.3.1. Cultivation of cross-cultural cognitive ability**

GenAI helps learners understand cultural differences and cultivate cross-cultural cognitive ability through scenario simulation technology. For example, in the teaching of English Business Negotiation, GenAI can generate comparative cases of Chinese and American business negotiations to analyze the cultural conflicts between the two sides in terms of directness and time concept. Through this scenario simulation, learners can intuitively feel the ways of business communication under different cultural backgrounds, so as to improve their cultural sensitivity. This intercultural learning experience helps learners better understand and respect different cultures in the context of globalization, and improve their intercultural communication ability.

In the process of foreign language teaching, intercultural training is an important training goal. In the process of foreign language teaching, GenAI can also provide learners with rich cultural background knowledge through multimodal content generation technology, thereby improving learners' intercultural literacy <sup>[5]</sup>. Through the multimodal cultural learning method, learners can not only improve their language ability but also enhance their cross-cultural understanding ability, which lays a solid foundation for future cross-cultural communication.

### **2.3.2. Values guidance and critical thinking**

Integrating cultural critical elements into language teaching is an important application of GenAI in foreign language teaching. In English intercultural teaching, DeepSeek can generate supplementary materials from a multi-cultural perspective to guide learners to dialectically analyze the ideology behind the language in view of the possible Western centralism narrative in the teaching materials. Through the cultivation of critical thinking, learners can develop the ability to think independently and avoid blindly accepting any culture or value.

At the same time, GenAI can also help learners understand the differences in values under different

cultural backgrounds through scenario simulation and case analysis. For example, when learning Arabic, GenAI can provide cases on religious beliefs and social norms in Arabic culture to guide learners to discuss and analyze. Through this kind of critical thinking training, learners can not only improve their language skills but also enhance their intercultural understanding and develop a global perspective and multicultural awareness.

### **2.3.3. Global competence and digital skills literacy**

It is important for foreign language learners to improve their global competence and digital skills. In the context of globalization, foreign language learners need to be able to understand diverse values in different cultural, social, and political contexts, have cross-cultural communication skills, an international perspective, and the ability to solve global problems. GenAI can help foreign language learners to broaden their international perspective, have the ability to think from a global perspective, and be able to use foreign language knowledge and subject knowledge to analyze global problems, such as climate change, poverty, public health, etc.

Digital skills literacy includes safe and effective use of digital technology, adoption of digital tools and platforms to enhance learning and work efficiency, compliance with digital ethics and legal norms, information literacy, and cybersecurity awareness. For foreign language learners, under the dual background of globalization and digitalization, they not only need to master foreign language knowledge, but also need to access global information and participate in cross-cultural communication through digital technology.

## **3. Application risks of GenAI in foreign language education**

Although generative AI has opened up a new path for the precision of foreign language teaching and the improvement of talent training efficiency, its application in the field of foreign language education also faces many challenges.

### **3.1. Risk of language accuracy: Model bias and error reinforcement**

Grammatical errors or non-standard expressions in the GenAI training set may be copied by learners, resulting in the solidification of incorrect knowledge. For example, if DeepSeek has insufficient knowledge of French gender articles, it may produce incorrect collocations such as “la garçon.” Such errors not only impair learners’ linguistic accuracy but may also be reinforced in the long term. Therefore, strict quality audits must be implemented on GenAI’s training data to ensure the accuracy of its language output and prevent misleading learners.

### **3.2. Risk of cultural misreading: Stereotypes and contextual distortion**

GenAI may exacerbate cultural biases and lead to misperceptions of culture. For example, when generating Arabic materials, if the corpus overemphasizes labels such as “religious” and “conservative,” it may output one-sided cultural descriptions and prevent learners from forming comprehensive cognition. Such cultural misunderstanding not only affects learners’ intercultural communication ability, but also encourages cultural misunderstanding and prejudice. In order to prevent such cases, it is necessary to balance the cultural description of GenAI from multiple dimensions to ensure that the cultural information output by GenAI is comprehensive and fair.

### **3.3. Risk of technology dependency: Reduced language creativity**

Over-reliance on GenAI to complete writing or translation tasks may lead learners to neglect the self-cultivation

of language ability and weaken the ability of autonomous expression. Neuroscientific studies have shown that long-term dependence on AI assistance will reduce the activity of Broca's area (language production center), thereby affecting the development of language creativity. Therefore, educators need to guide learners to use GenAI properly and encourage them to strengthen the internalization and creative use of language while using AI assistance.

The excessive use of AI, in addition to causing learners to develop technology dependency, may also lead to learners lacking the ability to think and solve problems independently when faced with complex language tasks <sup>[6]</sup>. For example, in the process of writing, if learners rely too much on the content generated by GenAI, they may ignore the improvement of their own language expression and thinking ability. Therefore, it is necessary to focus on cultivating learners' autonomous learning ability and critical thinking in the teaching process, so that they can maintain the ability of independent thinking and creative expression while using GenAI.

### **3.4. Risk of data privacy: Sensitive information leakage**

Foreign language learning involves a large amount of personal information, such as voice biometrics, cross-cultural communication records, etc. If the security protection of the GenAI system is insufficient, it may lead to the malicious use of this sensitive information. For example, learners' voice data may be used for technology development without consent; cultural exchange records may be used commercially and violate privacy rights. Therefore, it is necessary to strengthen the data security measures of the GenAI system to ensure that the personal information of learners is properly protected to prevent the risk of privacy disclosure.

On the other hand, data privacy issues may also affect learners' trust and acceptance of GenAI. If learners are worried about personal information leakage, they may have reservations about using GenAI, which may affect their use of AI tools. Therefore, in the development and application of GenAI, we should pay attention to privacy protection, establish a perfect data security management system, and ensure the information security of learners.

## **4. Risk response strategies for foreign language education**

### **4.1. Building a dual-track training system of "AI-language literacy"**

#### **4.1.1. Teacher training**

In order to improve the quality of foreign language education and meet the challenges brought by GenAI, it is crucial to carry out targeted teacher training programs. Specifically, special AI linguistics workshops should be set up to enhance teachers' ability to recognize and cope with model deviations. For example, by comparing manual review with AI-produced lesson plans, teachers can directly observe GenAI's potential shortcomings and thus cultivate GenAI's prudent cognition of technology. This kind of comparative analysis can not only help teachers grasp the strengths and limitations of GenAI but also provide guidance for them to rationally use GenAI in teaching practice.

In the training phase, teachers also need to learn how to effectively integrate GenAI into routine teaching activities, which includes familiarizing themselves with the basic operation of GenAI tools, mastering the application methods of GenAI tools in various teaching occasions, and flexibly adjusting GenAI use strategies according to teaching objectives and learners' needs. Through the training, teachers can turn AI into an effective tool to enhance teaching effectiveness, and then guide learners to properly use AI technology in the teaching process to prevent problems such as technology dependence and cultural misunderstanding.

### **4.1.2. Learner education**

In the aspect of learner education, the teaching of “technology ethics” should be incorporated into the language curriculum. Foreign language majors can set up “technology ethics” courses, which aim to explore the moral issues, social responsibilities, and values involved in the development and application of technology. In such courses, teachers can introduce cultural distortion cases in artificial intelligence translation to guide learners to analyze and discuss. Through case analysis, learners can deeply understand the possible cultural deviations in the language generation process of GenAI, so as to improve their digital citizenship literacy. This not only helps learners to use GenAI more wisely but also cultivates learners’ critical thinking and ethical awareness.

## **4.2. Building a “humanities-technology” collaborative education ecosystem**

### **4.2.1. Integration of interdisciplinary resources**

In order to ensure the efficient use of generative artificial intelligence in foreign language teaching, it is necessary to promote the integration of multidisciplinary resources. Specifically, linguistic researchers and technical talents should be combined to build a foreign language learning corpus. This corpus aims to ensure the diversity and accuracy of the output of artificial intelligence, so that it can not only meet the linguistic standards but also show the distinctive characteristics of different cultures in language generation. In the process of cooperation, the integration of multi-disciplinary resources is helpful to promote the academic exchange and integration of linguistics and technology. Through the regular organization of academic forums, seminars, and other activities, it enhances the thinking collision and experience exchange between linguistics researchers and technical talents, promotes the progress of academic fields and technical improvement, and provides solid support for foreign language teaching reform and innovation.

### **4.2.2. Optimized human-computer division of labor**

In the intelligent assisted teaching system, it is particularly critical to reasonably divide man-machine responsibilities. Specifically, the learning of basic modules such as grammar and words can be handed over to the intelligent system, and the core teaching tasks such as cultural interpretation and values education can be handed over to teachers. This assignment of duties can not only give full play to the advantages of intelligent systems in language processing, but also ensure that teachers play their unique role in teaching activities.

Through scientific human-computer collaboration, teachers can devote more time to the core areas of teaching, such as the in-depth analysis of culture, the cultivation of values, and the shaping of critical thinking. This will help to improve the quality and effectiveness of teaching, so that learners can not only master language skills, but also deeply understand the cultural connotations and values carried by the language. In addition, human-computer collaboration can also improve teaching efficiency and make the teaching process more fluent and efficient. The intelligent system can quickly process a large amount of language data, provide rich teaching resources and auxiliary tools for teachers, reduce teachers’ work pressure, and make them focus more on the key links of teaching.

## **4.3. Improving algorithm governance and data security framework**

### **4.3.1. Implementing transparent regulation**

To ensure the sound development of GenAI, it is necessary to build a regulatory system with high transparency. Specifically, GenAI service providers should disclose the data sources and annotation specifications of their language models and accept the review of independent third parties. Referring to the relevant regulations of the European Union’s Artificial Intelligence Act and China’s Interim Measures on the Management of Generative



Artificial Intelligence Services, it can be seen that transparent supervision of AI content providers will contribute to the healthy development of the industry, which will not only enhance public trust in AI, but also contribute to the normalization and standardization process of the AI industry.

#### **4.3.2. Privacy-enhancing technologies**

Protecting data privacy is critical in GenAI applications. In order to protect user information security, the use of privacy enhancement technology can improve data security and credibility, and protect user data. For example, the encryption and desensitization algorithms are used to process and desensitize language data locally to prevent the illegal use or disclosure of the original data, which helps to enhance users' trust in GenAI and promote the wide use of the technology. Privacy enhancement technology can also stimulate the innovation of GenAI technology. On the basis of protecting privacy and making full use of data resources, GenAI service providers can develop more accurate and efficient models to optimize application effects and user experience. This will help AI technology expand into more fields and create more value for society.

### **5. Conclusion and suggestions**

Generative artificial intelligence has brought the possibility of paradigm change for foreign language education, reshaping teaching content through dynamic knowledge scheduling, innovating learning forms through immersive interaction, and iteratively upgrading educational objectives through teaching models. It reconstructs the educational paradigm from three dimensions of teaching, learning, and educating through the technical closed loop of “precise scheduling, reasoning enhancement, and cognitive expression.” However, the risks associated with technology empowerment, such as knowledge distortion, value deviation, cognitive dependence, and data security, urgently need to be resolved through systematic strategies such as intelligent literacy cultivation, educational ecological reconstruction, and algorithm ethical governance. In the process of applying generative AI, attention should be paid to cultivating learners' deep understanding and perception of language and culture, and preventing excessive reliance on technology while ignoring its humanistic value.

From the perspective of practice, challenges and risks of GenAI in foreign language education are inevitable. Only through critical integration can the paradigm upgrade of foreign language education from “AI replacement” to “AI enhancement” be realized. In this process, maintaining humanistic care in education, ensuring learners' cognitive autonomy, and cultivating unique human traits are the core issues of foreign language teaching reform in the intelligent age. This requires educators, technology developers, and policy makers to form a community of values, seek a balance between technological progress and educational authenticity, and jointly create a new situation of human-computer collaboration in foreign language teaching.

Future research needs to further explore the deep integration of GenAI and language learning theory and transform classical language acquisition theory into quantifiable AI tutoring strategies. At the same time, strengthening interdisciplinary cooperation is also an important direction for the future development of foreign language education. The interdisciplinary integration of linguistics, education, computer science, psychology, and other disciplines will provide strong support for building a new prospect of foreign language education that takes into account both technological innovation and cultural sensitivity. Through interdisciplinary cooperation, we can give full play to the advantages of various disciplines, solve the technical, educational, and cultural problems faced by GenAI in foreign language education, promote the comprehensive development of foreign language education, and build a new prospect of foreign language education that takes into account both



technological innovation and cultural sensitivity, so as to cultivate foreign language talents with international vision, cross-cultural communication ability, and innovation spirit, to contribute to the cultural exchange and cooperation under the background of globalization.

## Disclosure statement

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# Research on the Value Connotation and Implementation Strategies of Blended Teaching in College Physical Education

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**Abstract:** Physical education is an important part of education, playing a positive role in enhancing students' physical health and promoting their all-round development. With the development of society and the application of digital technology, the traditional teaching model in college physical education has become difficult to adapt to the times and cannot meet students' needs for physical activities. Against this background, the blended teaching model has emerged, providing new ideas for the reform of college physical education teaching models. This study explores the value connotation and implementation paths of the blended teaching model in college physical education, clarifying its value and exploring its paths. The aim is to enrich students' campus physical education and cultural life, improve the teaching effect of physical education, cultivate students' interest in sports, promote their all-round development, and provide a reference for the reform of college physical education.

**Keywords:** Blended teaching; Higher education; Physical education teaching

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## 1. Introduction

Blended teaching integrates online and offline teaching models. While retaining the advantages of the traditional teaching model, it uses modern teaching technology means, digital information technology, and resources to enrich the teaching content, break through time limitations, and construct an integrated teaching system for in-class and after-class learning, which helps to improve teaching efficiency<sup>[1]</sup>. In the practice of college physical education teaching, teachers should change their teaching concepts, keep up with the development of the times, combine with the actual situation, make use of online resources, enrich and expand the online teaching front, highlight the advantages of online and offline physical education teaching, and give full play to the educational function of physical education<sup>[2]</sup>.

## **2. Value connotation of blended teaching in college physical education**

### **2.1. Remolding of physical education teaching concepts**

With the rapid development of information technology, the Internet has increasingly become an important tool for teaching reform and development, providing new ways for teachers' teaching and students' learning. The blended teaching model promotes the organic combination of college physical education and digital technology, conforms to the trend of the times, and is an effective way to reshape the physical education teaching concepts of teachers and students<sup>[3]</sup>.

The traditional college physical education teaching model mainly focuses on physical exercises, emphasizing physical training and sports skills while neglecting the learning of sports knowledge. In the blended teaching model, the online teaching part can make up for the lack of sports knowledge in physical education. It not only breaks through the time limitations of the traditional teaching model but also helps to meet the personalized needs of students.

### **2.2. Facilitating students' sports participation**

In traditional physical education teaching, the main learning methods are teachers' explanations and demonstrations, and students' imitative practices. This weakens students' learning enthusiasm and is not conducive to giving play to students' dominant position in the teaching process<sup>[4]</sup>. At the same time, the frequency of college physical education courses is relatively low. For students without a sports foundation, it is difficult to fully master the knowledge and skills of the learned sports events. Such students are prone to a lack of interest in participating in sports during physical education.

In blended teaching, the online part helps to promote students' sports participation and turn passivity into initiative. Before class, the online teaching resources are used to explain the sports knowledge and skills in the teaching content, enabling students to have a preliminary understanding of the course content. After class, students can review the learned content through online resources and communicate with teachers through communication software such as WeChat and Rain Classroom, and online platforms. Teachers can not only understand students' learning situations but also their individual differences. During the online interaction, students' individual problems can be discovered, and their mastery of sports knowledge and skills can be improved, which will enhance their interest in sports activities.

### **2.3. Improving the teaching effect**

The Internet has increasingly become an important place for college students to study and entertain. Compared with the traditional teaching model, the blended teaching method covers both online and offline teaching forms, bringing more freshness to learning<sup>[5]</sup>. The online teaching part starts from the students' familiar online world. Using electronic devices to collect information and learn knowledge not only brings great convenience to them but also helps to stimulate students' learning interest. In addition, the blended teaching model combines the advantages of online and offline teaching models. On the one hand, online teaching has the advantages of breaking through the boundaries of time and space, making up for insufficient learning time, and considering students' individual needs. On the other hand, offline teaching is the foundation of physical education teaching. Only through physical exercises can students complete the teaching tasks and achieve the teaching goals. The two are combined and complement each other. The blended physical education teaching model can provide students with rich teaching resources and innovative teaching methods, which are conducive to improving the teaching effect.

### **3. Implementation strategies of blended teaching in college physical education**

#### **3.1. Enriching online resources to meet learning needs**

With the development of information technology, the application of digital teaching resources has become more and more extensive. Online teaching already has an application foundation <sup>[6]</sup>. In college physical education, online teaching can be an important supplementary form of physical education courses. Online teaching has the advantages of diverse resources, strong interactivity, and flexible time and space. College physical education teachers can rely on online teaching platforms such as Rain Classroom to enrich online teaching resources. This can not only meet the diverse, personalized, and multi-level learning needs of students but also lay a solid foundation for offline teaching and make up for the insufficient time of offline teaching.

In terms of online resources, they should be enriched according to teaching needs. Teachers can use online teaching platforms to carry out sports theory knowledge, pre-class preview of physical education, and other links, thereby optimizing the physical education teaching design, improving teaching efficiency, and enriching teaching content. One of the limitations of traditional teaching is the lack of learning sports theory. Besides the limitations of physical education teachers' understanding of sports theory knowledge, the traditional teaching model lacks effective transmission of sports theory knowledge <sup>[7]</sup>. This can easily lead to a boring learning process and abstract learning knowledge, making it difficult for students to develop an interest in sports. Enriching online resources can greatly enrich the presentation of theoretical knowledge. Teachers can use means such as micro-courses, animations, videos, and VR for display, or they can make targeted online resources based on the actual teaching situation to stimulate students' learning interest and enhance students' learning experience. At the same time, presenting abstract sports knowledge in a concrete and interesting way reduces the difficulty of students' understanding and promotes practical exercises in offline classes.

In specific practice, teachers can upload relevant theoretical knowledge and teaching content to the online platform before physical education classes, allowing students to have a preliminary understanding of the learned content through online resources. For example, in football classes, when learning the instep shooting technique, teachers can upload the theoretical knowledge of the instep shooting technique to the learning platform <sup>[8]</sup>. Students can understand the theoretical knowledge through the learning platform and communicate online with teachers about any questions. At the same time, teachers upload the explanation and demonstration of the instep shooting movement technique to the learning platform. Students can leave an impression in their minds by watching the demonstration video, which is helpful for practical exercises and improves learning efficiency. Finally, online teaching can completely record students' learning behaviors. Through artificial intelligence and data analysis, teachers can accurately understand students' learning situations. In subsequent teaching, they can dynamically adjust the teaching links according to the learning situations, timely adjust teaching strategies, and improve the quality of classroom teaching. Students can directly understand their own learning situations according to the data analysis results, which helps to make up for their own deficiencies and promote sports participation.

#### **3.2. Optimizing offline teaching to stimulate interest in exercise**

The blended teaching model promotes the reform and development of college physical education teaching. While enriching online teaching, offline teaching also plays a crucial role. In universities, physical education courses are practical courses mainly based on students' physical participation, focusing on cultivating students' physical and mental health development and the mastery of sports skills. Under such subject characteristics, offline teaching cannot be replaced by online teaching <sup>[9]</sup>. Teachers should optimize the entire teaching process,

adhere to the “people-oriented” education and teaching concept, design offline teaching based on promoting students’ all-round development, keep up with the times, and stimulate students’ interest in exercise.

In the context of digital teaching reform, the important role of offline teaching cannot be ignored, especially in courses that attach importance to the cultivation of students’ practical abilities and the improvement of students’ physical health. The offline teaching link should highlight its characteristics, optimize its process, and enrich its content. In the specific implementation of college physical education courses, first of all, modern teaching means should be integrated. In the offline link, teachers need to keep up with the trend of information-based teaching. By applying digital resources and using virtual technology, they can bring students an intuitive feeling and a novel experience, thus stimulating learning enthusiasm. Teachers can use virtual reality technology in physical education teaching to simulate real-life sports scenes for students, allowing them to master sports skills in an immersive experience. For example, in combat-type courses, real-scene battles can be realized through virtual devices. While ensuring safety, students can understand their own mastery of movement techniques in real-time through the presentation of videos and data. Secondly, one of the pain points of offline physical education teaching is the difference in students’ levels. Using online teaching resources to assist offline teaching takes into account individual differences and helps to carry out hierarchical teaching. College physical education teaching involves a large number of students, and there are significant differences among individuals. Teachers should adopt the teaching principle of teaching students in accordance with their aptitudes to carry out hierarchical teaching, so that each student can effectively improve within their own level range. At this time, teachers can use the learning data of students in online self-learning, preview, and other links, and combine with simple physical fitness tests on students to divide students into different-level groups and develop targeted training plans. It should be noted that during the offline teaching process, teachers should maintain the coherence of the teaching content with online teaching, sort out simple knowledge, focus on explaining key and difficult points and students’ knowledge weaknesses, and through functions such as personal demonstrations and face-to-face guidance, which are not available in online teaching, deepen students’ understanding and application of knowledge points to ensure the maximization of teaching effects. Finally, in college physical education teaching, sports theory knowledge should account for a certain proportion. However, it is difficult to effectively integrate sports knowledge into physical education teaching in the traditional teaching model. Teachers can use online teaching to focus on cultivating students’ theoretical basis, while offline teaching focuses on the practical link, leading students to carry out physical exercises together, increasing students’ exercise time. This can not only avoid unbalanced knowledge acquisition of students but also meet the development requirements of physical education teaching for students’ physical qualities and sports skills.

### **3.3. Strengthening after-class activities to enrich campus sports activities**

The teaching time of college physical education classes is limited. To effectively ensure the teaching effect of physical education and comprehensively improve the quality of physical education, teachers can strengthen the scientific management of students’ after-school time and carry out a variety of after-class expansion activities. These activities not only help students consolidate the knowledge learned in class and transform theory into practice but also effectively improve students’ physical fitness and enhance their physique, giving full play to the educational function of physical education courses<sup>[10]</sup>.

Teachers can leverage the advantages of blended teaching to assign after-class physical exercise homework through the online teaching platform. Students are required to complete the exercise tasks within the specified time and upload the process or results to the platform. Teachers correct the physical exercise homework and give



feedback so that students can understand their own situations. At the same time, teachers can also dynamically track the completion of students' homework through the interactivity of the online platform and provide personalized adjustment suggestions for subsequent physical education courses. In terms of offline teaching, teachers can extend physical education teaching to students' after-school lives by organizing group cooperation, fun games, sports competitions, and other activities. According to students' learning abilities, interests, and knowledge mastery, physical exercise tasks with appropriate difficulty are designed to fully stimulate students' internal motivation and cultivate their teamwork and competitive awareness.

While making full use of the blended teaching model, colleges and universities should enrich campus sports activities, meet students' sports needs, promote the integration of sports activities into students' daily lives, and help students develop good exercise habits and healthy lifestyles.

Colleges and universities can establish various sports clubs and associations according to students' interests. By holding various activities, students' interests and hobbies are organically integrated with physical exercises, meeting the personalized learning needs of different students and providing students with more opportunities to participate in sports activities. At the same time, a campus sports competition system should be constructed. Sports competitions are an important way to promote students' physical health and enhance the connection between students. Schools can organize campus-wide sports competitions. A rich variety of competition settings can enhance the fun and competitiveness of sports activities, create a strong sports atmosphere on campus, and allow students to exercise and surpass themselves in the competitions.

## **4. Conclusion**

In conclusion, under the new era background, college physical education teaching faces new opportunities and challenges. The blended teaching model provides a new direction for the reform and development of college physical education teaching. College physical education workers should keep up with the times, update teaching concepts, and actively explore and apply the blended teaching model to physical education teaching practice. Firstly, we should clarify the advantages of blended teaching and its significance in the application of college physical education. Secondly, scientific and reasonable implementation strategies should be developed to ensure the effective implementation of online and offline physical education teaching, and improve teaching efficiency and quality. Finally, the new model may lead to new problems, and we need to constantly explore and improve in teaching practice to cultivate students' interest in sports, establish students' lifelong sports concept, and take the cultivation of students' all-round development as the ultimate goal of college physical education teaching.

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# Teacher Development in the “AI + Education” Ecosystem: Application Ability of Artificial Intelligence for Primary School English Teachers and Construction of Training System

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**Abstract:** In the current era of digitalization sweeping the education field, primary school English education is facing new challenges and opportunities of deep integration with artificial intelligence. This study focuses on primary school English teachers and uses various methods such as questionnaire surveys, visits, and interviews to conduct an in-depth exploration of their artificial intelligence literacy. After data analysis, optimization strategies are proposed to further improve the artificial intelligence literacy of primary school English teachers and promote the development of educational soft power.

**Keywords:** Primary school English teacher; Artificial intelligence literacy; Teacher Artificial Intelligence Capability Framework; Enhancement strategy

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## 1. Introduction

### 1.1. Research background and objective

In today's digital age, the application of artificial intelligence technology is constantly expanding and profoundly affecting various aspects of human life, and the education sector is also deeply influenced by it. The “Outline of the Plan for Building an Educationally Strong Country (2024–2035)” issued by the Central Committee of the Communist Party of China and the State Council clearly proposes to open up new development tracks and shape new development advantages through the digitization of education. The Ministry of Education has issued a notice on strengthening artificial intelligence education in primary and secondary schools, aiming to achieve basic popularization of artificial intelligence education in primary and secondary schools by 2030. The “Teacher AI Competency Framework” released by UNESCO defines the knowledge that teachers must master in the era of artificial intelligence.

At present, the artificial intelligence literacy of primary school English teachers varies greatly, and there

are many problems <sup>[1]</sup>. Therefore, this study aims to gain a deeper understanding of the current status of artificial intelligence literacy among primary school English teachers through a questionnaire survey, analyze the existing problems and their causes, and propose practical and feasible improvement strategies to provide strong support for promoting innovative development in primary school English teaching.

## **1.2. Research significance**

The digital literacy of primary and secondary school teachers in our country is generally at a medium level <sup>[2]</sup>. At the theoretical level, in-depth research on the artificial intelligence literacy of primary school English teachers can help enrich and improve the theoretical system of teacher professional development. With the advancement of digital transformation in education, artificial intelligence literacy has become an important component of teachers' ability structure. In-depth research on teachers' artificial intelligence abilities and literacy can deepen our understanding of the connotation and extension of teachers' professional development, and promote the construction of a more comprehensive and adaptable theoretical framework for teachers' professional development that meets the needs of the times.

At the practical level, enhancing the artificial intelligence literacy of primary school English teachers is of great significance. On the one hand, it can help teachers better utilize artificial intelligence technology to optimize the teaching process, provide precise teaching based on individual differences of students, improve teaching quality and efficiency, and promote the improvement of students' language abilities. On the other hand, it can provide a reference for relevant departments to formulate scientific and reasonable teacher training policies and educational development plans, promote high-quality education, and advance the overall development of primary school English education in China.

## **2. Research method**

### **2.1. Investigation implementation**

In this survey, a questionnaire was distributed to primary school English teachers in various regions. To overcome the limitations of time and space during the survey process, this study adopted the Wenjuanxing network questionnaire survey method, effectively utilizing media platforms such as WeChat groups and community forums to distribute questionnaires for primary school English teachers. The survey questionnaire involves primary school English teachers from 6 grades, covering 28 provinces. Finally, a total of 402 questionnaires were collected, of which 398 were valid questionnaires and 4 were invalid questionnaires, with an effective rate of 99%. The collected data was comprehensively summarized and organized in the later stage, meeting the requirements of data statistics and serving as a basis for analyzing the survey results.

### **2.2. Data analysis methods**

In order to ensure the scientific validity of the survey questionnaire and the reliability of the data, this study used reliability and validity analysis methods to evaluate the collected data.

This study conducted a detailed analysis of the collected data using SPSS.

#### **2.2.1. Questionnaire reliability analysis**

Reliability indicates the consistency or stability of a scale. Cronbach's alpha reliability coefficient was used as the reference standard for reliability evaluation in the study. The following is the reliability analysis of the scale section in the questionnaire, as shown in **Table 1**.

**Table 1.** Cronbach’s reliability analysis (simplified format)

Number of items	Sample size	Cronbach’s alpha coefficient
17	337	0.717

### 2.2.2. Questionnaire validity analysis

Validity is an important indicator for measuring the effectiveness of a questionnaire survey. In this study, KMO and Bartlett’s tests were used as reference standards for validity evaluation. The following is the validity analysis of the scale section in the questionnaire, as shown in **Table 2**.

**Table 2.** KMO and Bartlett’s test

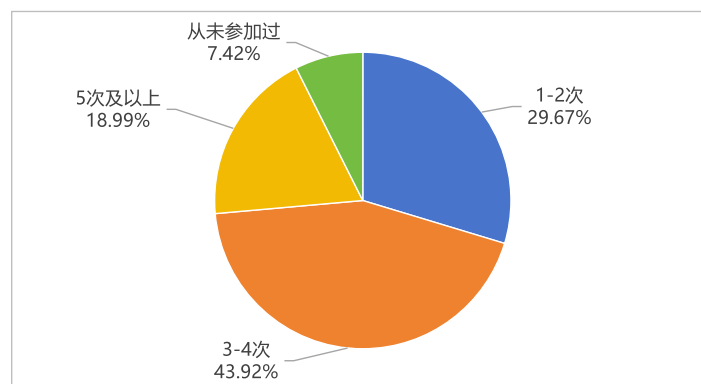
KMO value		0.833
Bartlett sphericity test	Approximate chi-square	1364.571
	<i>df</i>	136.000
	<i>P</i> -value	0.000

## 3. Current status of artificial intelligence literacy among primary school English teachers

### 3.1. Research on teachers’ participation in artificial intelligence literacy training

This survey is based on the “Artificial Intelligence Fundamentals and Application Skills” in the UNESCO Teacher Artificial Intelligence Competency Framework, and investigates whether schools provide training to teachers on the principles, application foundations, and application skills of artificial intelligence.

The survey shows that in the past two years, primary school English teachers have participated in training sessions related to artificial intelligence technology (**Figure 1**). About 44% of teachers participated in 3–4 training sessions within two years, and about 30% of teachers participated in 1–2 training sessions within two years. But this is the number of training sessions that teachers have participated in within two years, with the highest proportion being 3–4 times. Relatively speaking, the average time teachers receive relevant training per semester is very little. The application of artificial intelligence technology requires in-depth learning and practice based on the characteristics of the discipline, and the current training frequency clearly cannot meet this demand. The lack of attention from local education departments or schools and the absence of corresponding artificial intelligence training have resulted in teachers being unable to receive sufficient support and opportunities to enhance their technical application abilities. The country and schools need to take stronger measures to promote the improvement of teachers’ artificial intelligence literacy.

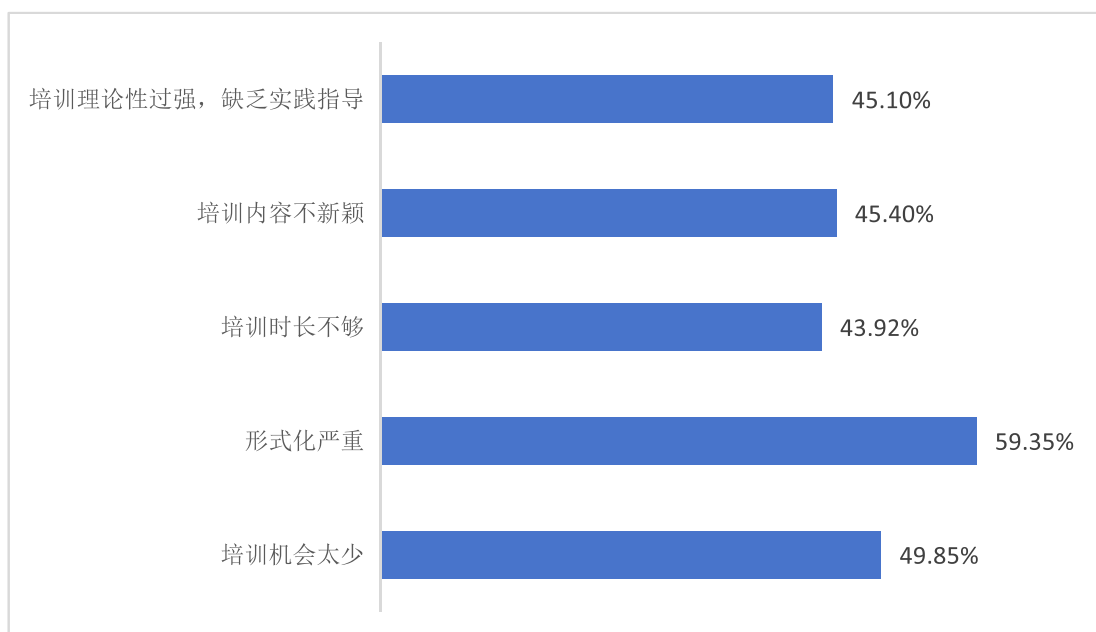
**Figure 1.** Survey and analysis of teachers’ participation in artificial intelligence literacy training



### 3.2. Research on problems in artificial intelligence literacy training

This survey is based on the theory of “integration of artificial intelligence and teaching methods” in the UNESCO Teacher Artificial Intelligence Competency Framework. It investigates the training issues related to AI-assisted teaching and the integration of AI and teaching, and continues the previous survey to ensure its coherence.

In response to the national government report, some regions have organized training on artificial intelligence literacy for primary school teachers. Survey data (**Figure 2**) shows that there are still deficiencies in the current artificial intelligence literacy training, mainly including too few training opportunities, strong theoretical training, a lack of practical guidance, and insufficient training duration. These issues seriously affect the effectiveness of training and limit the improvement of teachers’ artificial intelligence literacy. It is urgent to improve the design and implementation of training to enhance its practicality and effectiveness. Only by helping teachers truly master artificial intelligence technology can they fully unleash its potential in teaching and promote the development of educational informatization and modernization.

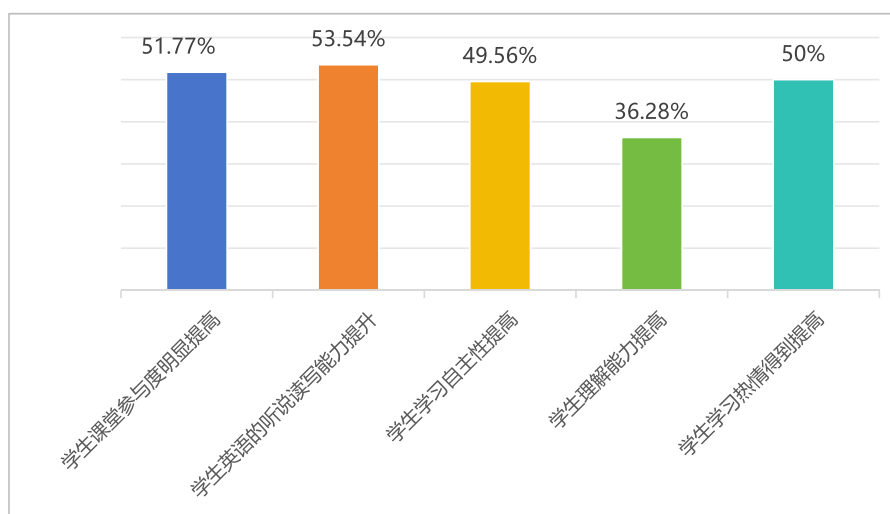


**Figure 2.** Survey and analysis of problems in artificial intelligence literacy training

### 3.3. Research on the impact of artificial intelligence-assisted teaching on students

This survey is based on the theory of “integration of artificial intelligence and teaching methods” in the UNESCO Teacher Artificial Intelligence Competency Framework, and investigates the support of artificial intelligence in teaching methods.

The survey report shows that artificial intelligence-assisted teaching not only plays a significant role in teachers’ own literacy but also has many positive impacts on students (**Figure 3**). Teachers believe that after using artificial intelligence to assist teaching, students’ classroom participation has significantly increased, their learning autonomy has improved, their learning enthusiasm has been enhanced, and their English listening, speaking, reading, and writing abilities have been strengthened. Therefore, in the future, it is necessary to further strengthen teacher training, optimize technological design, increase investment in educational informatization, fully tap into the potential of artificial intelligence-assisted teaching, and provide better support for students’ learning and growth.



**Figure 3.** Survey and analysis of the influence of AI-assisted teaching on students

### 3.4. Reasons for the current situation caused by artificial intelligence-assisted teaching

At the teacher level, some teachers' understanding of artificial intelligence remains superficial, lacking an understanding of its potential in education, resulting in a lack of enthusiasm for AI-assisted teaching, and some teachers even have resistance. Secondly, teachers themselves have limited opportunities to receive artificial intelligence literacy training, and the training content is often too theoretical and lacks practical guidance, making it difficult for teachers to apply the knowledge they have learned to actual teaching and effectively improve their application abilities.

At the school level, there is a lack of a comprehensive AI literacy training system for teachers, and the training content, format, and frequency cannot meet the needs of teachers, resulting in poor training effectiveness. Secondly, the school did not develop personalized training and development plans based on individual differences of teachers, resulting in a lack of targeted training and ineffective improvement of teachers' artificial intelligence literacy.

At the social level, the cooperation between the education and business sectors is not close enough, resulting in a lack of sufficient funding and technical support for the application of artificial intelligence technology in the education field, and prone to technological homogenization, that is, the application of artificial intelligence technology in the education field lacks innovation and practicality. In addition, society's understanding of artificial intelligence is not comprehensive enough, which can easily lead to exclusion from parents and students. These factors have all led to the insufficient status quo of teachers in AI-assisted teaching.

## 4. Optimization path of artificial intelligence literacy for primary school English teachers

### 4.1. Teacher's autonomous development

#### 4.1.1. Establishing the concept of lifelong learning and enhancing the understanding of artificial intelligence

In the rapidly changing present, artificial intelligence is advancing day by day, and new data models are constantly emerging. From the perspective of factors affecting the artificial intelligence literacy of primary school English teachers, improving subjective factors is more convenient. Primary school English teachers should keep up with the development of the times, constantly update their knowledge structure, and establish the concept of

lifelong learning.

Primary school English teachers need to intensify their understanding of relevant artificial intelligence books and literature. Primary school English teachers should actively understand the basic concepts, development history, application areas, and future trends of artificial intelligence. There are a large number of literature on the integration of artificial intelligence in early foreign education, and the exploration of artificial intelligence and education in China is still continuing. Primary school English teachers stay up-to-date with the latest research achievements and application cases in the field of artificial intelligence by browsing professional websites, subscribing to industry journals, and following experts and scholars.

These books and literature describe the methods, far-reaching impacts, and optimization paths of using artificial intelligence to empower primary school English education, providing effective references for the integration of artificial intelligence in education in the new era and offering optimal solutions for current primary school English teachers' classroom practices.

Primary school English teachers should actively participate in training and lectures organized by schools and education departments. According to public survey data, some teachers refuse to participate in training and lectures related to the integration of artificial intelligence education, citing reasons such as being too old to use artificial intelligence and having limited classroom time. Often, these trainings and lectures grasp the cutting-edge ideas of integrating artificial intelligence into education, enabling systematic learning of the application of artificial intelligence technology in education.

#### **4.1.2. Actively participating in practical exploration and enhancing the application capability of artificial intelligence**

Teachers should be problem-oriented and break down the barriers to traditional solutions<sup>[3]</sup>. Practical exploration can help teachers transform artificial intelligence technology into practical teaching abilities. Primary school English teachers can try using various artificial intelligence teaching tools. Currently, every artificial intelligence software on the market has its specific advantages. Primary school English teachers can classify and apply artificial intelligence teaching software based on classroom teaching objectives to achieve optimal teaching effectiveness. Primary school English teachers can actively try using tools such as artificial intelligence speech recognition, machine translation, and intelligent grading to assist in dictation, listening, and reading classes in English teaching, improving teaching efficiency.

Primary school English teachers can actively participate in research projects on the integration of artificial intelligence and English teaching, explore the application models of artificial intelligence technology in different teaching stages, and summarize experiences and lessons learned. Through systematic research, primary school English teachers can deeply accumulate experience in human-computer collaborative teaching, collect corresponding data, establish a teaching case library, and provide practical basis for building an intelligent English teaching model. Primary school English teachers can enter the research library of teaching software, put forward their own opinions, and provide timely summary of successful experiences and failed lessons to R&D personnel, promote the development of intelligent teaching software, and ultimately achieve the dual goals of improving teaching efficiency and promoting the development of domestic teaching facilities.

## **4.2. Schools promote development**

### **4.2.1. Improving the teacher training system**

At present, most schools have conducted training on artificial intelligence-assisted teaching, and teachers have a certain level of artificial intelligence literacy, but the quality of training needs to be improved. Therefore, it is

necessary for schools to improve their artificial intelligence teaching and training system. Schools should organize regular artificial intelligence literacy training to enhance the artificial intelligence literacy of new and old teachers. Schools can combine local characteristics with school-based curriculum to provide unique training, making the training more specific and distinctive. Schools cannot be limited to just holding group meetings, but can also build platforms such as flipped classrooms, workshops, and laboratories. The school's training system can combine practical cases from various grades, integrate theory with practice, and enable teachers to apply it flexibly. Encourage teachers to actively participate and select teachers with high artificial intelligence literacy for specialized training. These teachers can impart operational skills of artificial intelligence-assisted teaching to other teachers and form their own unique experiences. Schools can increase the reward for teachers using artificial intelligence to assist teaching, and combine it with teacher assessment work to promote learning, application, and excellence through evaluation. Targeted training on high-quality teachers' artificial intelligence literacy can be conducted to fully promote the trend of teachers attaching importance to artificial intelligence-assisted teaching.

#### **4.2.2. Customized personalized teacher development path**

Different teachers have different ages, teaching styles, and basic knowledge. Schools can evaluate teachers' artificial intelligence literacy and customize personalized development paths for them based on the evaluation results. There are significant differences in the level of technology acceptance and learning styles among teachers of different age groups. Young teachers may be more accustomed to diverse teaching, while experienced teachers may be more inclined to rely on their own experience in teaching. Therefore, schools should consider these differences and provide suitable learning methods and resources for teachers of different age groups. Each teacher has their own teaching style, and without special instructions, artificial intelligence carries neutral emotions and generates content that does not fit the teacher's personal style. Based on the teaching style of the teacher, instructions can be given to the artificial intelligence to generate corresponding styles. Therefore, schools should also provide different technical training and application guidance for different teachers.

### **4.3. National empowerment for development**

#### **4.3.1. Promoting cooperation between the education and business sectors**

The learning content of students not only exists in the classroom, but also students' horizons are particularly important. Teachers need to make use of some conditions and resources to improve students' listening and speaking abilities as well as their comprehensive qualities. Therefore, the continuous follow-up of AI technology is needed <sup>[4]</sup>. The country attaches great importance to the development of education, and the integration of artificial intelligence into education is a great opportunity and a major driving force for business. Education is the great plan of the country, and commerce is the engine of national economic growth. The two are coordinated by the state, which can produce a synergistic effect and inject a continuous stream of power into the future development of the country. Collaboration between the education sector and the artificial intelligence industry has the potential to break through many limitations of traditional education. The artificial intelligence industry can master more practical teaching cases, improve the actuarial degree and analytical ability of data. A large number of cases are analyzed by artificial intelligence and stored in databases to accurately understand the characteristics of each type of student. Artificial intelligence customizes better personalized learning plans, improving the work efficiency of teachers and the learning efficiency of students.

The investment in education in the artificial intelligence industry can create vast opportunities for

development. If DeepSeek collaborates with the government, it can create artificial intelligence specifically designed to serve government systems, greatly improving work efficiency. If artificial intelligence collaborates with the education sector, various types of artificial intelligence software and machines can be derived to meet the learning needs of different age groups and requirements. Meanwhile, the collaboration between artificial intelligence and the education sector can drive the development of other industries and boost employment.

#### **4.3.2. Vigorously promoting the importance of artificial intelligence literacy**

Although artificial intelligence involves various aspects of life, there are still some groups that have not fully recognized the importance of teachers' artificial intelligence literacy. There are also significant differences in artificial intelligence literacy among regions, with poor teaching facilities and lack of advanced artificial intelligence equipment for teaching in remote areas. Some schools also do not attach importance to teachers' artificial intelligence literacy. The country should use various media channels to strengthen public promotion of artificial intelligence literacy. For remote areas, the country should strengthen offline publicity efforts. Organize a team of experts to go deep into schools and carry out activities to popularize artificial intelligence literacy. Carefully design artificial intelligence literacy training courses, set up practical sessions, and enable teachers to have a comprehensive and clear understanding of artificial intelligence.

### **5. Conclusion**

This study conducted a questionnaire survey and field research to sort out the levels of artificial intelligence literacy among primary school English teachers based on the United Nations' "Teacher Artificial Intelligence Competency Framework." It deeply analyzed the current situation of artificial intelligence literacy among primary school English teachers, revealed the existing problems and their causes, and proposed targeted optimization paths.

Research has found that although the application of artificial intelligence technology in the field of education is gradually becoming popular, there is still significant room for improvement in the artificial intelligence literacy of primary school English teachers. Some teachers have a relatively shallow understanding of artificial intelligence and lack systematic training and practical opportunities, which makes it difficult for them to effectively apply artificial intelligence technology in teaching. In addition, insufficient support from schools and society also hinders the improvement of teachers' artificial intelligence literacy.

Based on the research results, this study proposes specific optimization strategies from three levels: teacher self-development, school promotion of development, and national empowerment of development. Firstly, teachers should establish the concept of lifelong learning, actively participate in training and practice related to artificial intelligence, and enhance their technical application abilities. Secondly, schools should improve their teacher training system, develop personalized training plans, and help teachers better integrate artificial intelligence technology into teaching practice. Finally, the country should strengthen cooperation between the education and business sectors, promote innovative applications of artificial intelligence technology in the field of education, and publicize the importance of artificial intelligence literacy through various channels to enhance the overall society's awareness of artificial intelligence education.

### **Disclosure statement**

The author declares no conflict of interest.



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# Research on the Construction of Aesthetic Education Courses in Universities from an Interdisciplinary Integration Perspective: A Case Study of Sichuan University

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**Abstract:** Higher education increasingly emphasizes the unique role of aesthetic education in cultivating virtue and morality. From the perspective of integrating aesthetic education with teaching, this study develops an analytical framework to explore the theoretical foundations, practical pathways, and teaching mechanisms involved in interdisciplinary aesthetic education course construction at Sichuan University. Employing literature analysis and case studies, the paper systematically examines the theoretical basis of aesthetic education and its contemporary demands in higher education. Specifically, it focuses on Sichuan University's initiatives in aesthetic education curriculum reform, covering practices such as curriculum design, faculty team development, resource coordination, and collaboration between internal and external institutions. Findings suggest that interdisciplinary aesthetic education courses enrich the content of aesthetic education in universities and enhance students' overall competence; however, these courses also face challenges like insufficient faculty and inadequate evaluation mechanisms during implementation. Consequently, this paper proposes strengthening top-level design, refining the curriculum system, enhancing faculty training, and improving evaluation mechanisms as recommendations for future improvement. This research aims to provide valuable references for aesthetic education reform in higher education in the new era, significantly contributing to interdisciplinary synergy and the comprehensive educational goal of integrating moral, intellectual, physical, aesthetic, and labor education.

**Keywords:** Aesthetic education; Interdisciplinary integration; Curriculum construction; Teaching reform

**Online publication:** June 30, 2025

## 1. Introduction

In the context of the new era, the construction of aesthetic education courses in higher education has received unprecedented attention. Aesthetic education constitutes a crucial component of talent cultivation in universities and should be integrated throughout the entire educational process<sup>[1]</sup>. By immersing students in natural, social, and artistic beauty, aesthetic education contributes significantly to enhancing students' aesthetic literacy and

overall quality. It not only enhances students' aesthetic abilities but also significantly promotes their mental health and personality development by meeting emotional needs such as autonomy, competence, and belonging, thus guiding their spiritual pursuits and cultivating moral character <sup>[2,3]</sup>. Currently, however, many universities' aesthetic education courses suffer from issues such as limited content, restricted design, and inadequate integration, making it difficult to effectively fulfill the demand for well-rounded talent cultivation in the new era <sup>[4]</sup>. Exploring pathways to construct interdisciplinary aesthetic education courses and innovating aesthetic education teaching models has thus become an urgent topic for reform in higher education.

Interdisciplinary integration, through combining knowledge, methods, and resources from different disciplines, breaks traditional disciplinary boundaries and expands the breadth and depth of aesthetic education courses, effectively cultivating students' comprehensive abilities and innovative awareness. Particularly, intersections among art, technology, and humanities, exemplified by STEAM education models, significantly enhance students' creativity and innovative thinking <sup>[5,6]</sup>. Collaborative interdisciplinary teaching enriches classroom formats and strengthens students' teamwork and communication skills <sup>[7]</sup>. Furthermore, incorporating artistic elements into other disciplinary courses can increase classroom engagement and participation, fostering a more open and inclusive learning environment.

Constructing aesthetic education courses through interdisciplinary integration aligns with the intrinsic shift in talent cultivation from specialized expertise towards holistic development in the new era, embodying the philosophy of "broad aesthetic education," and promoting coordinated growth in humanistic literacy and innovative thinking. Universities can integrate aesthetic education into all aspects of general and specialized education, bridging the gaps between arts and sciences, humanities and technology, thereby enabling students to enhance their aesthetic appreciation and humanistic qualities while mastering professional knowledge, ultimately cultivating innovative talent with comprehensive development.

## **2. Theoretical framework**

### **2.1. The connotation and educational value of aesthetic education**

Aesthetic education is an educational approach that enhances individuals' aesthetic capabilities and promotes emotional development through aesthetic activities and artistic practices. Its core objective is to cultivate students' abilities to perceive, appreciate, and create beauty, thereby facilitating personality perfection and spiritual enrichment. Contemporary aesthetic education theories assert that aesthetic education extends beyond mere artistic skills training, highlighting instead the positive impact of aesthetic experiences on individual personality integrity. Aesthetic activities nourish students' emotional lives, contributing significantly to their spiritual freedom and personality development. This perspective aligns closely with contemporary humanistic educational philosophy, emphasizing that education fundamentally serves to realize individuals' self-worth and personality growth. It advocates fully respecting students' emotional experiences and developmental needs throughout the educational process. University-level aesthetic education directly responds to these educational demands by facilitating students' spiritual freedom and comprehensive personality development through aesthetic and artistic experiences.

### **2.2. Theoretical support for interdisciplinary integrated education**

Interdisciplinary integrated education aims to overcome the limitations of traditional single-discipline teaching models by integrating knowledge and methods from diverse fields, thereby fostering students' comprehensive abilities and innovative consciousness. The theoretical underpinnings of interdisciplinary integration can be summarized in three aspects:

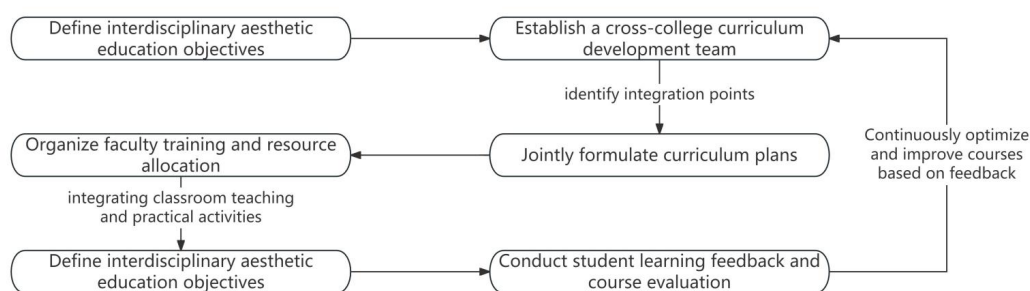
- (1) Constructivist learning theory: Constructivism emphasizes that knowledge results from learners actively constructing understanding based on prior experiences. Teachers should create authentic interdisciplinary contexts to guide students in actively exploring and experiencing, thus constructing their aesthetic knowledge systems and fostering interdisciplinary cognitive integration abilities.
- (2) Theory of multiple intelligences: Proposed by the American psychologist Howard Gardner, the theory of multiple intelligences suggests that individuals possess diverse forms of intelligence, including linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, interpersonal, and intrapersonal intelligences. Traditional education often neglects the development of artistic intelligence, whereas interdisciplinary aesthetic education courses integrate the arts with other disciplines, unlocking students' potential across multiple intelligences and promoting holistic development.
- (3) Pragmatic educational philosophy: Represented by John Dewey, pragmatism stresses that education must be grounded in authentic life situations. Dewey argued that aesthetic experiences are inseparable from daily life, viewing artistic activities as inherently practical processes. Interdisciplinary aesthetic education integrates aesthetic instruction into everyday practice, enabling students to gain rich, holistic life experiences, thus achieving an effective unity between aesthetic education and practical living.

### 2.3. The contemporary theoretical demands of university aesthetic education reform

Universities, as crucial institutions for talent cultivation, bear significant responsibilities in enhancing students' humanistic literacy and comprehensive quality. Aesthetic education has risen to become one of the “five educations,” standing equally alongside moral, intellectual, physical, and labor education. Consequently, universities must systematically construct aesthetic education curricula to cultivate talent equipped with humanistic literacy and innovative capabilities suited to the new era. Currently, higher education faces a profound transformation in its concepts of talent cultivation and teaching modes, with increasing emphasis on comprehensive student development, innovative capability, and spiritual-cultural needs. Promoting interdisciplinary integration in university aesthetic education courses represents an intrinsic requirement for the ongoing educational reform and development within higher education institutions.

## 3. Teaching reform practices at Sichuan University

As a comprehensive research-oriented university, Sichuan University leverages its multidisciplinary strengths to undertake effective reforms in aesthetic education courses. During the implementation of interdisciplinary integrated aesthetic education curriculum construction, the university established a clear working process, as illustrated in **Figure 1**. The specific practical experiences are reflected primarily in the following aspects.



**Figure 1.** Implementation process of interdisciplinary aesthetic education

### 3.1. Top-level planning and improving the aesthetic education system

Sichuan University formulated the Implementation Plan for Strengthening and Improving Aesthetic Education in the New Era. The university incorporated aesthetic education into its overall talent cultivation framework, clearly defining the positioning and objectives of aesthetic education in cultivating morality and character. Within the general education curriculum, Sichuan University offers mandatory aesthetic education courses such as Chinese Culture (Arts Edition), integrating content from literature, history, philosophy, and the arts to systematically enhance students' humanistic and artistic literacy. Additionally, Sichuan University established the Art Education Center as a coordinating institution responsible for the planning and implementation of public art courses, promoting resource sharing and collaborative teaching across colleges. This university-wide strategic design, supported by specialized aesthetic education departments, provides essential organizational guarantees for the sustainable construction of aesthetic education courses.

### 3.2. Enriching course offerings and creating integrated course modules

Sichuan University actively diversifies course offerings and establishes integrated course modules across multiple disciplines, providing public elective art appreciation and practical courses in fields such as music, fine arts, drama, and film accessible to students from various departments, as illustrated in **Table 1**. For instance, the elective course Symphonic Music Appreciation, offered by the Art Education Center, is popular among students due to its integration of historical and cultural contexts, and has been selected among the Ministry of Education's first batch of national first-class undergraduate courses. The university's original stage drama on revolutionary themes, *Sister Jiang* at Sichuan University, combining artistic practice with ideological education, has been recognized as an outstanding case by the Ministry of Education. Furthermore, the university established cross-college collaboration mechanisms, encouraging faculty from different disciplines to jointly offer interdisciplinary aesthetic education courses. For example, the course Introduction to Digital Media Arts, a collaboration between the College of Art and the School of Computer Science, integrates programming technology with visual arts, effectively cultivating students' interdisciplinary abilities in art and technology. Through abundant and innovative course offerings, Sichuan University students typically enroll in two to three aesthetic education courses during their studies, creating favorable conditions for comprehensive improvement in aesthetic literacy.

**Table 1.** Examples of interdisciplinary integrated aesthetic education course modules at Sichuan University

Course module	Course name	Participating colleges	Integrated disciplines	Credits	Teaching method
Art Appreciation Module	Symphonic Music Appreciation	College of Art	Music, History, Culture	2	Lectures, practical sessions
Artistic Practice Module	Introduction to Digital Media Arts	College of Art, School of Computer Science	Digital Technology, Visual Arts	2	Project-based practice
Integrated Innovation Module	Design and Engineering Aesthetics	College of Engineering, College of Art	Engineering Technology, Aesthetic Design	3	Project collaboration
Professional Integration Module	Introduction to Art Therapy	College of Art, West China Hospital	Art, Medicine, Psychology	2	Practical workshops

### 3.3. Building a diverse teaching team

The successful implementation of interdisciplinary aesthetic education courses relies on a high-quality and diverse teaching team. Sichuan University actively fosters such a team by combining internal faculty training with external talent recruitment, as illustrated in **Table 2**. Faculty members from different colleges within the university are



encouraged to participate in aesthetic education teaching. For example, teachers from the College of Literature and Journalism collaborate with those from the College of Art to jointly deliver public art courses, achieving interdisciplinary collaboration among literature, history, philosophy, and the arts. Additionally, faculty members from engineering disciplines who possess artistic skills are invited to teach courses such as photography and industrial design aesthetics, thereby integrating aesthetic elements from a professional perspective.

Furthermore, the university actively recruits industry experts and social art talents as adjunct teachers or guest lecturers. For instance, renowned artists and designers are invited to deliver master classes, and symphony orchestra musicians offer music appreciation courses. This combined “internal and external” faculty model significantly enhances teaching quality and promotes interdisciplinary communication and collaboration among faculty members within the university.

The university regularly organizes teacher training sessions and teaching workshops to share aesthetic education experiences. At the institutional level, the university explicitly stipulates that the interdisciplinary aesthetic education course teaching team must consist of members from at least two different disciplines. Additionally, collaborative teaching achievements are incorporated into faculty evaluation and incentive mechanisms, providing strong human resources support for course integration.

**Table 2.** Composition of the aesthetic education teaching team at Sichuan University

Teacher type	Source	Examples of disciplinary background	Courses or activities	Number (persons)
Full-time	College of Art (Internal)	Music, Fine Arts, Drama	Public Art Appreciation Courses	25
Part-time	Other Colleges (Internal)	Literature, History, Philosophy, Science and Engineering	Interdisciplinary Integrated Aesthetic Education Courses	30
External	External Art Institutions	Artists, Designers	Master lectures, workshops	15

### 3.4. Collaborative construction and resource sharing

Sichuan University fully leverages internal and external resources to build aesthetic education practice platforms, promoting collaborative education.

- (1) Internal interdisciplinary collaboration: Relying on its own museums, art galleries, and other on-campus resources, Sichuan University has developed these venues into a “second classroom” for aesthetic education. For example, exhibitions of calligraphy, painting, seal carving, and historical artifacts are regularly organized, enabling students to visit and study, effectively integrating campus cultural activities with aesthetic education. The university also utilizes engineering laboratories to offer practical courses such as “Art and Materials” and “Design and Engineering Aesthetics,” integrating engineering experimental teaching with artistic creativity.
- (2) University-local cooperation: Sichuan University collaborates with local cultural institutions in Chengdu to carry out aesthetic education through social practice programs. Students participate in volunteer docent roles at museums and science centers, extending aesthetic education beyond campus boundaries. Additionally, the university cooperates with institutions such as the Sichuan Provincial Song and Dance Theatre and Symphony Orchestra, inviting these art groups onto campus for performances and lectures, enriching students’ artistic experiences.
- (3) Interdisciplinary research and project practice: Notably, the College of Art at Sichuan University has launched an interdisciplinary experimental art project titled “Art × Design × Psychology,” in collaboration with West China Hospital and other institutions, exploring innovative models of art therapy. The

project brings together experts, scholars, faculty, and students from various fields, including medicine, psychology, painting, design, dance, and music, using experimental art to aid in the rehabilitation of individuals with psychological disorders. This initiative has created a collaborative platform between the medical and art colleges and has also resulted in elective courses such as “Introduction to Art Therapy,” effectively achieving the integration and practical application of interdisciplinary knowledge.

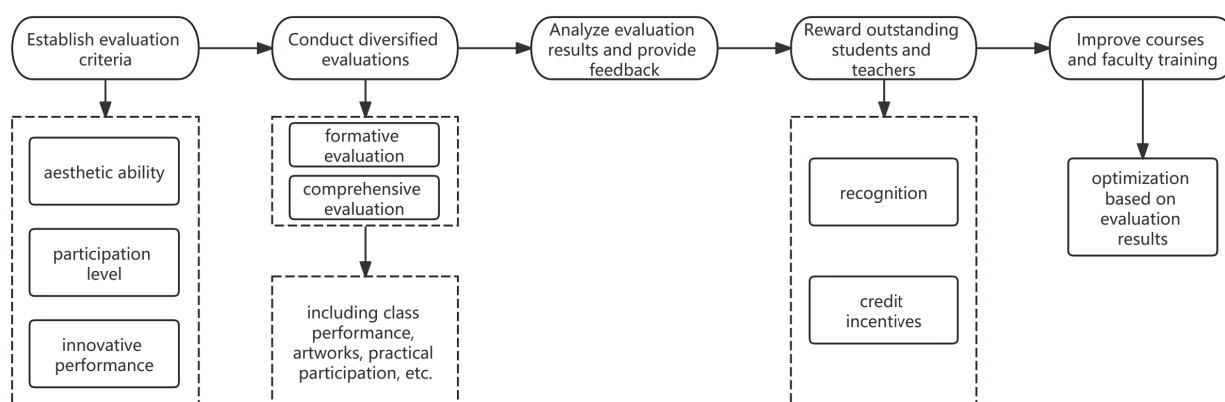
Through the aforementioned collaborative initiatives, aesthetic education at Sichuan University extends beyond traditional classroom boundaries, establishing an integrated educational framework that combines classroom teaching, campus culture, and social practice.

### 3.5. Teaching mechanisms and evaluation innovations

During the implementation of aesthetic education courses, Sichuan University commonly adopts flexible and diversified teaching methods and evaluation mechanisms. In courses focused on music and art appreciation, interactive appreciation sessions, scenario-based experiences, and artistic creation activities are introduced, emphasizing students’ participation and practical abilities. Project-based learning methods are implemented, requiring students to collaborate in groups to complete interdisciplinary art projects or research reports, thereby cultivating their teamwork and innovative thinking skills. Additionally, to stimulate students’ interest, certain courses employ blended online and offline teaching models, leveraging high-quality MOOC resources to expand students’ autonomous learning opportunities.

Regarding course evaluation, Sichuan University shifts the focus away from traditional written examinations and emphasizes a combination of formative and comprehensive evaluations, as illustrated in **Figure 2**. Students’ class attendance and participation, art creations or practical reports, and classroom discussion performance are all included in assessments, collectively constituting a significant proportion of the final grade. This diversified evaluation system better aligns with the characteristics of aesthetic education courses, comprehensively reflecting improvements in students’ aesthetic competencies. Furthermore, the university has established a feedback mechanism for course quality, regularly collecting student opinions and expert observations to continuously enhance teaching content and methods.

In terms of administration, Sichuan University incorporates aesthetic education courses into the talent cultivation quality monitoring system, tracking aspects such as course offerings, student enrollment numbers, and teaching effectiveness. Outstanding courses and teachers are recognized and rewarded, while problematic courses are promptly revised or phased out, ensuring the sustainable and positive development of the aesthetic education curriculum construction.



**Figure 2.** Innovative evaluation system

## 4. Existing problems and suggestions for improvement

Despite the notable achievements of Sichuan University's aesthetic education curriculum reform, several shortcomings remain, offering universal insights for other institutions. Key issues include:

- (1) Insufficient faculty resources: Currently, the number and professional composition of aesthetic education teachers do not fully meet the demands. There is a notable shortage of teachers with interdisciplinary backgrounds capable of delivering aesthetic education. Many courses rely heavily on faculty from art disciplines, with limited participation from other departments. Additionally, faculty members' abilities to innovate in aesthetic education teaching require further improvement.
- (2) Inadequate course coverage and depth: Although the number of aesthetic education courses has increased, their coverage and relevance for students across different majors remain limited. Engineering and science students, for example, often face heavy academic workloads and are thus hesitant to enroll in elective aesthetic education courses. Some courses still focus primarily on teaching artistic skills, lacking sufficient interdisciplinary integration and consequently failing to fully engage non-art students.
- (3) Incomplete evaluation and incentive mechanisms: Aesthetic education courses often carry relatively low weight in performance evaluations and credit systems, sometimes resulting in insufficient commitment from both students and faculty. Students often prioritize their GPA from professional courses over aesthetic education electives. Moreover, the recognition of aesthetic education teaching outcomes in faculty evaluations and promotions remains limited, affecting teachers' motivation and enthusiasm.
- (4) Insufficient long-term collaborative education mechanisms: Interdisciplinary aesthetic education practices across colleges and departments primarily rely on short-term or temporary projects, lacking sustained collaboration. External resources, though introduced, often lack consistent integration into long-term teaching frameworks; collaborations with art institutions and community groups, for instance, are largely event-based without stable practice bases.
- (5) Underdeveloped student evaluation and feedback system: There are insufficient quantitative indicators to measure improvements in students' aesthetic literacy. Student feedback and individualized needs are not adequately reflected in course improvements. The university-wide monitoring and evaluation system for aesthetic education requires further enhancement to identify issues promptly and disseminate successful experiences.

Based on these challenges, the following suggestions for improvement are proposed:

- (1) Strengthening policy support and top-level design: Universities should refine institutional documents related to aesthetic education, integrating aesthetic education courses as mandatory elements within the training programs. For instance, establishing explicit graduation requirements where undergraduate students must complete a certain number of aesthetic education credits. Establishing dedicated university-level funds to support interdisciplinary course development and faculty training can also help. Through institutional support, departments can better prioritize aesthetic education, fostering comprehensive participation throughout the university.
- (2) Expanding faculty teams and teaching capabilities: Universities should enhance aesthetic education teacher training by encouraging faculty from diverse disciplines to participate in aesthetic education training, learning fundamental artistic and aesthetic methodologies to integrate into their courses. Creating mechanisms for mutual teacher exchange and collaborative teaching—for example, between liberal arts and engineering faculties—can facilitate interdisciplinary collaboration. Additionally, hiring industry experts as adjunct teachers while enhancing young faculty members' aesthetic teaching skills,

and incorporating participation in aesthetic teaching as a positive factor in faculty evaluation and promotions, can further encourage greater faculty involvement.

- (3) Optimizing curriculum structure and content integration: The university should systematically review existing aesthetic education courses, categorizing them into modules such as art appreciation, artistic practice, and integrated innovation. For students majoring in fields other than art, more accessible and engaging general education courses, like “Beauty and Creativity in Science” or “Fundamentals of Aesthetics in Engineering Design,” could be introduced to lower participation barriers. Identifying aesthetic elements within professional courses and integrating aesthetic education with ideological education (“Curriculum Ideology and Politics”) can further enrich the educational experience. Courses should also integrate deeper interdisciplinary content—for example, incorporating historical and cultural stories into music appreciation classes or aesthetic theories into calligraphy courses—to enhance their appeal and educational depth.
- (4) Enhancing evaluation and incentive mechanisms: The university should refine the student aesthetic education evaluation system, integrating aesthetic literacy assessments into the overall student evaluation framework. Tools could be developed to quantitatively evaluate students’ artistic appreciation abilities, aesthetic expression, and practical participation. Students who excel or actively participate in aesthetic activities should receive recognition through academic credits or honors, fostering a positive atmosphere for aesthetic education. Faculty members’ aesthetic teaching outcomes should be incorporated into their performance evaluations, with incentives and recognition given to teams offering interdisciplinary aesthetic education courses, thus enhancing faculty enthusiasm and commitment.
- (5) Deepening collaborative construction and practical education: A stable collaborative education platform should be established internally and externally. For example, long-term cooperation agreements with local cultural and art institutions could be formalized to jointly create aesthetic education practice bases, regularly sending students for practice experiences with mutual recognition of academic credits. On-campus collaborations across colleges should also be encouraged through events such as interdisciplinary aesthetic competitions and cultural salons. Moreover, leveraging modern information technology to establish an aesthetic education resource-sharing platform, providing access to high-quality aesthetic education resources and event information for faculty and students, can further expand learning opportunities. Mechanisms for sustained collaboration will help integrate aesthetic education deeply into campus culture and social practice, forming a long-term educational network.

By implementing these measures, universities can significantly enhance the quality and impact of aesthetic education courses, truly achieving comprehensive aesthetic education objectives involving all students throughout their educational journey, in every aspect of campus life.

## 5. Conclusion

The construction of interdisciplinary aesthetic education courses represents an essential direction for teaching and educational reform in universities in the new era. The experiences at Sichuan University demonstrate that effectively integrating aesthetic education into multiple disciplinary contexts not only enriches curriculum content and enhances students’ aesthetic literacy and humanistic qualities but also fosters innovative talent, embodying the value of a comprehensive approach to aesthetic education within higher education. Nevertheless, reforming aesthetic education courses is a systemic endeavor, requiring sustained improvements in faculty



resources, curriculum design, and institutional mechanisms.

Higher education institutions should draw lessons from pioneering universities such as Sichuan University, adapting these insights to their unique disciplinary strengths, and exploring innovative paths for integrating aesthetic education with professional training. By persistently advancing aesthetic education initiatives and establishing new collaborative educational models, universities will better cultivate well-rounded talent, addressing the moral, intellectual, physical, aesthetic, and labor development requirements of contemporary society.

The journey of aesthetic education reform in higher education remains long and demanding, calling for continued exploration and practice among educators. Future reforms should consistently uphold the fundamental educational mission of fostering virtue and cultivating individuals through beauty, ensuring that aesthetic education deeply influences the minds and hearts of young students. With deeper implementation of interdisciplinary integration concepts, aesthetic education in higher education institutions is poised to flourish even more brilliantly in the new era.

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# Research on Strategies to Enhance Undergraduates' Willingness to Pursue Postgraduate Studies in the Context of Employment Pressure

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**Abstract:** Against the backdrop of employment pressure, pursuing graduate studies has become a crucial pathway for undergraduate students to enhance employment competitiveness and alleviate employment challenges. However, the recent downward trend in graduate school applicants has rendered the improvement of undergraduates' willingness to pursue advanced degrees an urgent practical issue. This study employs a questionnaire survey method to empirically investigate the influencing factors of undergraduates' intention to pursue graduate studies. The findings reveal that at the individual level, preparation difficulty, preparation pressure, clarity of goals, and academic planning significantly affect students' willingness to pursue graduate studies. At the family level, preparation costs and family atmosphere exert substantial influence on this decision-making process. Accordingly, this paper proposes enhancement strategies from both individual and family perspectives to improve enrollment rates. Students should establish clear academic objectives and strengthen psychological adjustment, while families ought to provide robust financial support and foster harmonious environments. These recommendations aim to effectively boost undergraduates' motivation for graduate education.

**Keywords:** Willingness to pursue graduate studies; Undergraduate students; Employment pressure

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## 1. Introduction

With the continuous improvement of higher education popularization and teaching quality in China, the number of high-quality talents has been increasing, intensifying competition in the job market. Currently, society's rigid demands for higher education and better-qualified graduates have significantly increased the employment pressure and created a challenging job market for undergraduates. In this context, pursuing postgraduate studies has become an important way for many undergraduates to enhance their employability and alleviate employment difficulties. However, data shows that the number of applicants for master's degree programs in China was 4.38 million in 2024, a decrease of 360,000 compared to 2023<sup>[1]</sup>, and further declined to 3.88 million in 2025<sup>[2]</sup>. Therefore, enhancing undergraduates' willingness to take the postgraduate entrance exam (known as *kaoyan* in China) has become an urgent issue to address in the face of employment pressure.

Scholars from various fields have interpreted the phenomenon of *kaoyan* based on different theoretical perspectives. From a sociological perspective, *kaoyan* is seen as a means for individuals to acquire higher social status and cultural capital <sup>[3]</sup>. From an economic perspective, *kaoyan* behavior can be viewed as an educational investment based on cost-benefit analysis <sup>[4]</sup>. From a psychological perspective, it represents a learning motivation for students to satisfy their inherent needs and achieve self-actualization <sup>[5]</sup>. In summary, the *kaoyan* phenomenon is a complex multi-dimensional issue, reflecting students' survival, economic, or social choices driven by self-improvement, employment needs, conformity, or familial pressure <sup>[6,7]</sup>. Additionally, scholars have conducted valuable explorations into the factors influencing undergraduates' willingness to take the *kaoyan* and their success rate. Gender differences, grade distribution, major background <sup>[8]</sup>, and employment situation <sup>[9]</sup> are key factors affecting *kaoyan* decisions. However, candidates' study plans, target universities, physical condition <sup>[10]</sup>, and preparation methods <sup>[11]</sup> significantly impact the success rate of *kaoyan*. In conclusion, most existing studies are qualitative, and only a few scholars have conducted descriptive statistical analyses based on survey data. This paper aims to address the gaps in current research by focusing on undergraduates' willingness to take the *kaoyan*. Through questionnaire surveys and data collection, descriptive statistics, and logistic regression analysis, the study proposes countermeasures and suggestions to enhance undergraduates' willingness to take the *kaoyan*, with the goal of improving the enrollment rate.

## **2. Analysis of the current situation of undergraduates' willingness to take the postgraduate entrance examination**

This paper adopts the questionnaire survey method to collect data on undergraduates' willingness to take the postgraduate entrance examination across the country. Through online distribution of questionnaires, a total of 379 valid questionnaires were collected. The basic information of the samples and their willingness to take the postgraduate entrance examination are analyzed as follows.

### **2.1. Basic information statistics of the samples**

From the perspective of gender, males account for 43.8% and females account for 56.2% of the survey samples. In terms of grade, freshmen, sophomores, juniors, seniors, and alumni account for 14.25%, 16.62%, 20.32%, 23.48%, and 25.33%, respectively. From the perspective of major, normal education accounts for 15.83%, art accounts for 22.43%, humanities and social sciences account for 29.82%, and science and engineering account for 31.93%. In terms of school level, students from vocational colleges account for 15.57%, students from ordinary undergraduate schools account for 47.49%, students from 211 universities account for 26.12%, and students from 985 universities account for 10.82%. From the perspective of academic performance, those with excellent performance account for 24%, those with medium performance account for 56%, and those with poor performance account for 20%.

### **2.2. Analysis of characteristics of undergraduates' willingness to take postgraduate entrance examination**

The survey data shows that undergraduates' willingness to take the postgraduate entrance examination presents the following five characteristics: Firstly, nearly half of the students are willing to take the postgraduate entrance examination. Among the 379 respondents who participated in this survey, 42.48% expressed a willingness to apply for postgraduate studies, while 57.52% indicated their unwillingness. The data shows that students who

are willing to take the postgraduate entrance examination are in the minority, indicating that most students prefer direct employment rather than continuing their studies. Secondly, students tend to apply to external universities. Among the respondents who are willing to take the postgraduate entrance examination, 47% chose to apply for their own university, while 53% chose to apply for external universities. This indicates that students are more inclined to choose external universities for various reasons, including pursuing better academic resources, exploring new learning environments, and matching target employment markets. Thirdly, students tend to apply for lower-level universities. The data shows that 22.98% chose to apply for universities of the same level as their undergraduate institution, 35.4% chose to apply for higher-level universities, and 41.61% chose to apply for lower-level universities. This suggests that students are more inclined to apply for lower-level universities, primarily to avoid competition and increase their chances of success in the postgraduate entrance examination. Fourthly, students tend to apply for cross-major studies. Among the respondents who are willing to take the postgraduate entrance examination, 35% chose to apply for their own major, while 65% chose to apply for a different major. This indicates that students are more inclined to choose cross-major studies for various reasons, including career development orientation, personal interest drive, and reducing the difficulty of the postgraduate entrance examination. Lastly, students tend to apply for professional master's programs. According to the survey data, the proportion of students applying for academic master's programs is 40.37%, while the proportion of students applying for professional master's programs is 59.63%. This suggests that students are more inclined to apply for professional master's programs. The reasons include the lower difficulty of public course examinations for professional masters, higher enrollment rates compared to academic masters, the practical and applied focus of professional master's education, shorter durations compared to academic masters, and lower requirements for thesis publication.

### **3. Analysis of factors influencing undergraduates' willingness to take the postgraduate entrance examination**

To explore the specific factors influencing undergraduates' willingness to take the postgraduate entrance examination, this paper employs regression analysis, with the willingness to take the exam as the dependent variable and the difficulty of preparation, cost of preparation, clarity of goals, educational planning, pressure of preparation, and family atmosphere as independent variables. Using SPSS software for binary logistic regression analysis, the influencing factors of undergraduates' willingness to take the postgraduate entrance examination are obtained. The data analysis results show that all six factors have a significant impact on undergraduates' willingness to take the exam. This paper categorizes and analyzes these six influencing factors from both personal and family perspectives as follows.

#### **3.1. Personal-level influencing factors**

At the personal level, the difficulty of preparation, pressure of preparation, clarity of goals, and educational planning are important factors that affect undergraduates' willingness to take the postgraduate entrance examination. Firstly, the difficulty of the exam can have a negative impact on undergraduates' willingness to take it. The process of preparing for the exam requires a significant amount of time and energy to review various courses, organize a large amount of study materials, and learn more challenging subjects, which can be daunting for students. Secondly, the pressure of preparing for the exam can reduce undergraduates' enthusiasm for taking it. During the preparation period, students face heavy academic pressure, and prolonged study in a tense and high-pressure environment can leave them feeling exhausted, affecting their preparation efficiency and forcing

them to abandon their exam plans. Additionally, the clarity of goals plays a crucial role in undergraduates' willingness to take the exam. When students have a clear understanding of their career plans, taking the postgraduate entrance examination often becomes a significant pathway to achieving their personal goals, thereby enhancing their willingness to take the exam. Conversely, if their goals are unclear, they may hesitate to take the exam due to a lack of direction. Finally, educational planning is also an important factor influencing undergraduates' willingness to take the exam. Some students do not consider pursuing further graduate studies because their educational planning only extends to the undergraduate level, and thus they do not have the willingness to take the exam.

### **3.2. Family-level influencing factors**

At the family level, both the cost of preparation and family atmosphere can greatly influence undergraduates' willingness to take the postgraduate entrance examination. Regarding the cost of preparation, firstly, the high cost of taking the exam can be a burden for students. Preparing for the exam requires purchasing a large amount of study materials and paying registration fees, which can be a considerable expense for families with average economic conditions. Secondly, the various costs associated with graduate studies can also be daunting for some students from economically disadvantaged backgrounds, ultimately discouraging them from pursuing further education. In terms of family atmosphere, a poor family relationship can lead to emotional instability among candidates, making it difficult for them to focus on exam preparation and efficient learning. On the other hand, a warm and supportive family atmosphere can provide comfort and a strong source of psychological support for candidates, and a positive and motivated mental state can greatly enhance their willingness to take the postgraduate entrance examination.

## **4. Countermeasures to enhance the willingness of undergraduates to take the postgraduate entrance examination based on the orientation of advancing to higher education**

Based on the analysis of the influencing factors of undergraduates' willingness to take the postgraduate entrance examination, this article proposes countermeasures and suggestions from both individual and family perspectives, with the goal of increasing the advancement rate to higher education.

### **4.1. Individual level: Clarifying goal planning and strengthening psychological adjustment**

Firstly, it is recommended that undergraduate students clarify their career directions as early as possible and conduct practice and research in various career fields, so as to develop appropriate plans for their career paths. For instance, undergraduates can gain a deeper understanding of the daily work and life of different career groups by participating in career planning courses, reading popular magazines related to different career groups, and engaging in career assessments or internship experiences. This will help them to more clearly understand their interests, skills, and career directions. At the same time, students can also choose to consult career planning experts in the industry to plan a suitable career path based on their professional characteristics and market demands, rather than blindly following the trend to continue their studies under pressure. Furthermore, during the process of preparing for the postgraduate entrance examination, learning pressure and anxiety are common issues. It is suggested that undergraduates learn how to effectively manage emotions and cope with stress. On one hand, schools can provide mental health education courses and psychological counseling services



to undergraduates, assisting them in mastering various stress management skills, including but not limited to time management, emotion regulation, and relaxation training. On the other hand, students preparing for the examination should also strive to cultivate a positive and optimistic attitude, learn how to draw lessons from failures, improve their self-confidence, and maintain a healthy mindset during their preparation.

#### **4.2. Family level: Strengthening economic security and creating a harmonious atmosphere**

First and foremost, parents should provide solid economic support and security for students preparing for the postgraduate entrance examination. Based on the family's economic situation, parents can provide necessary study expenses such as purchasing learning materials and paying for tutoring fees. For students from families with economic difficulties, parents can also encourage them to apply for grants or scholarships, or reduce economic pressure through part-time jobs. Meanwhile, good home-school communication can help improve students' study efficiency, cultivate good study attitudes, and enhance their self-confidence. During the students' preparation process, parents should provide a deep understanding and full support to ensure minimal impact on their studies and daily lives. Secondly, family members should understand and support each other, jointly creating a high-quality environment conducive to students' preparation, allowing them to focus on their studies. Finally, parents need to provide emotional support and encouragement to students preparing for the postgraduate entrance examination, and conduct psychological counseling when necessary to eliminate psychological pressure, improve psychological quality, and achieve good study results. This emotional support not only alleviates students' stress but also boosts their confidence, helping them better prepare for the examination.

### **5. Conclusion**

In summary, in recent years, the willingness of undergraduates to take the postgraduate entrance examination has been declining year by year. The difficulty of preparation, pressure of preparation, clarity of goals, academic planning, cost of preparation, and family atmosphere all significantly affect undergraduates' willingness to take the examination. Therefore, students should clarify their goal planning, strengthen psychological adjustment, and families should strengthen economic security and create a harmonious atmosphere, in order to effectively enhance the willingness of undergraduates to take the postgraduate entrance examination.

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# Theoretical Logic of Organic Integration of Shenzhen Red Culture into the Teaching of Basic Principles of Marxism in Vocational Undergraduate Programs of Bay Area Characteristics

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**Abstract:** Shenzhen Red Culture is the result of the organic combination of the basic principles of Marxism and Chinese reality, presented in the form of red stories and practical events during the socialist revolution and construction. Shenzhen Red Culture is intrinsically compatible with the knowledge points of the Basic Principles of Marxism (Principles) course. Shenzhen Red Culture is integrated into the teaching of the vocational undergraduate Principles course with Bay Area characteristics, guiding the value shaping of Bay Area youth and highlighting the school-based characteristics, vocationality, and professionalism of the vocational undergraduate Principles course.

**Keywords:** Shenzhen Red Culture; Vocational undergraduate; Basic Principles of Marxism; The Guangdong-Hong Kong-Macao Greater Bay Area

**Online publication:** July 3, 2025

## 1. Introduction

The General Secretary pointed out, “‘Great Civics and Politics Course’ we should make good use of it, and it must be combined with reality”<sup>[1]</sup>. As an early demonstration zone for reform and opening up, and one of the leading cities in the Guangdong-Hong Kong-Macao Greater Bay Area, Shenzhen forms an economic and cultural radiation circle with cities in the province. Although Shenzhen is a young city, it has red cultural resources dating back to the period of the Land Revolutionary War, and Shenzhen Red Culture includes not only revolutionary culture, but also reform and opening-up culture. At present, there are fewer research results on Shenzhen Red Culture in China, so it is necessary to fully explore the red culture of Shenzhen and apply it to the teaching of Basic Principles of Marxism (hereinafter referred to as “Principles”) in vocational undergraduate degree programs with Bay Area characteristics.

Shenzhen Red Culture contains the artisan spirit of being first, daring to think, daring to do, and striving

for perfection, which is compatible with the vocational elements of vocational undergraduate programs. The reason Shenzhen Red Culture can be integrated into the teaching of Principles is that Shenzhen red cultural resources and some of the ideas in the chapters of Principles are compatible, and Shenzhen Red Culture is intrinsically compatible with the knowledge points of the Principles course. Shenzhen Red Culture is the result of the organic combination of the basic principles of Marxism and Chinese reality, and is presented in the form of red stories and practical events during the period of socialist revolution and construction. It can not only provide evidence for the scientific nature of Marxism, but also rendering power, influence, dissemination, and affinity of the image carrier to resolve the dullness of the modularity of the content of the Principles, and at the same time, the rich and figurative red stories of Shenzhen provide case evidence for the theoretical interpretation of the basic principles of Marxism.

No literature was retrieved on the China National Knowledge Infrastructure regarding the teaching reform of the course “Principles of Vocational Bachelor’s Degree with Bay Area Characteristics.” By searching “Shenzhen Red Culture,” China National Knowledge Infrastructure shows 16 articles (as of June 11, 2025), of which no literature related to it was retrieved. There are four pieces of literature related to the teaching of Civic and Political Studies and Party History Education in colleges and universities: Shenzhen red cultural resources contain rich historiographic value, contemporary value, and teaching innovation value, and it is necessary to integrate them into the teaching of Civic and Political Studies and Party History Education in colleges and universities <sup>[2-5]</sup>. However, existing studies have not examined the integration of Shenzhen Red Culture into the teaching of vocational undergraduate “Principles” class with Bay Area characteristics. Therefore, based on the development of vocational undergraduate courses in Guangdong, Hong Kong, and Macao Bay Area, this paper explores the core issue of how Shenzhen Red Culture can be integrated into the teaching of vocational undergraduate Principles courses with Bay Area characteristics, with the hope of guiding the value shaping of Bay Area youths in the linkage between the campus and the social communication and integration process, and highlighting the school-based characteristics, vocationality, and professionalism of vocational undergraduate Principles courses.

## **2. Theoretical path of organic integration of Shenzhen Red Culture into the teaching of vocational undergraduate Principles courses in the Bay Area**

The fit between Shenzhen Red Culture and the basic principles of Marxism is mainly reflected in its revolutionary practice, the spirit of reform and opening up, and the logic of social development. There are seven chapters in the textbook of the Principles, and in each chapter, Shenzhen red cultural resources can be found as a case bank.

### **2.1. The great changes in Shenzhen’s development, interpreting materialism and dialectics**

Shenzhen Red Culture includes both Shenzhen revolutionary culture and Shenzhen reform and opening up culture. Shenzhen, as the frontier of reform and opening up, has bred a rich culture of reform and opening up. Revolutionary cultural heritage site of Dongjiang Column Command, reform and opening up the “first shot” of Shekou Industrial Zone, Lotus Hill Deng Xiaoping statue as a cultural symbol, reflecting the “defying the enemy, indomitable” spirit of struggle, “time is money, efficiency is life” spirit of reform, and the innovation spirit of “dare to be the first in the world” as important qualities of Shenzhen’s reform and opening up culture. The former sites of the Dongjiang Column Command, etc., which are material existences and witnesses of history, have witnessed the struggle of the revolutionary forefathers on this piece of land. Shekou Industrial

Zone, as a “testing ground” for reform and opening up, is based on the practice of material production, through land reclamation, the introduction of foreign investment, and other specific actions, through the introduction of foreign investment, the implementation of distribution according to labor, restructuring of the relations of production, and the release of productive forces; Lianhua Mountain Park, where the statue of Deng Xiaoping stands majestically in honor of Deng Xiaoping, pioneer of reform and opening up to the world, has put together the Deng Xiaoping Group, which is one of the special economic zones in Shenzhen. Shenzhen, as one of the special economic zones, Deng Xiaoping’s southern talk emphasized that “development is the hard way.” These coincide with the first principle of materiality in the first chapter of the Principles.

Dialectical materialism holds that the unity of the world lies in materiality, that matter determines consciousness, and at the same time recognizes the dynamic reaction of consciousness to matter, and that things are universally connected and eternally developing; that the law of the unity of opposites is the fundamental law of the development of things. In the process of reforming Shekou, they were faced with the contradiction between planned economy and market economy, and the conflict between efficiency and fairness, which were gradually formed through practice, demonstrating the principle of dialectic law that the unity of opposites of contradictions promotes the development of society.

## **2.2. The road to truth in Shenzhen’s “experimental field” and the interpretation of practical materialism**

Shenzhen Red Culture was nurtured in revolutionary practice. The practice of anti-Japanese struggle by the Guangdong People’s Anti-Japanese Guerrilla Army (the predecessor of the Dongjiang Column) in the Shenzhen area gave rise to the understanding of the revolution and the thinking about the destiny of the country. These understandings further guided the subsequent revolutionary practices and promoted the development of red culture. Currently, young students have a deeper perceptual understanding of Shenzhen’s red culture through visiting red culture memorial halls, sites, and other practical activities, on the basis of which, after thinking and research, they rise to rational understanding, which in turn will lead to better protection and inheritance of the red culture, and to carry out more related practical activities.

Reform and opening up culture in Shenzhen’s red culture and innovative development practices in Qianhai Cooperation Zone. Qianhai has developed from a mudflat into an international financial center. Qianhai has continuously made trial and error and summed up experience in system innovation (e.g. cross-border financial and rule of law reforms), and ultimately formed the “Qianhai Model,” which can be popularized, and which verifies that “practice is the only criterion for testing the truth.”

According to practical materialism, the view of practice is the primary view of Marxism. Practice is the source, driving force, and test of cognition. Understanding comes from practice, and the process of understanding is a dialectical development from perceptual understanding to rational understanding, and then from rational understanding to practice. Through the pilot cross-border finance, rule of law innovation, and other policies, Qianhai FTZ “crosses the river by groping the stones” practice exploration, local practice to verify the feasibility of theory, in line with the Marxist epistemology of “practice-knowledge-practice again.”

## **2.3. The power of Shenzhen’s pioneering cows, testifying to historical materialism**

Shenzhen Red Culture in the revolutionary period of the Dongjiang Column resistance history is a high-quality red resource. On December 12, 1942, the Guangdong People’s Anti-Japanese Guerrilla Army Dongjiang Column was formally established, to the end of the War of Resistance Against Japanese Aggression, the Dongjiang Column developed to more than 11,000 people, relying on the masses to establish



bases in the War of Resistance Against Japanese Aggression, guerrilla warfare, reflecting the “people are the main body of social history!” This embodies the idea of “the people are the main body of social history” and shows that class struggle drives the change of social form. The Dongjiang Column North Evacuation Memorial Park in Kwai Chung Street, Longgang District, records the history of the masses covering the transfer of troops, confirming that “the mass line is the lifeblood of the Party.” The red case resources of the Dongjiang Column’s resistance not only illustrate the role of the people in history, but also reflect the reflection of social consciousness on social existence, reflecting the social contradictions and revolutionary needs of the Shenzhen area at that time. During the revolutionary period, advanced red cultural ideas inspired the people to join the revolution and promoted social change.

The reform and opening up culture in Shenzhen’s red culture is embodied in the reform history of the Shenzhen Special Economic Zone. The magnificent transformation of Shenzhen from a small fishing village in the border town to a global metropolis is a typical case of the adaptation of production relations to the development of productive forces. After Deng Xiaoping established Shenzhen as a special economic zone in 1980, the establishment of the Shekou Industrial Zone broke the constraints of the planned economy through land auctions, shareholding reforms, and other institutional innovations, and the promotion of the exploration of the socialist market economy, which unleashed the productive forces and verified the law of “the reaction of production relations to the productive forces”. Shenzhen’s governance model of “small government, big society” reflects the need for the superstructure to adapt to the development of the economic base. The “pioneering spirit” of reform and opening up, breaking the shackles of the planned economy, embodies the contradictory movement of the productive forces and the relations of production, the economic base, and the superstructure.

## **2.4. Exploration of socialist market economy in Shenzhen, deepening Marx’s theory of surplus value**

Marxist political economy dissects the commodity economy and the law of value, the nature of the capitalist economic system, and the characteristics of the capitalist superstructure. Marx’s theory of surplus value reveals the essence of capital exploitation. The reform and opening up culture of Shenzhen’s red culture is reflected in the reform of labor relations during Shenzhen’s early industrialization. 1980s Shenzhen’s Shekou Industrial Zone took the lead in implementing the labor contract system, breaking the “iron rice bowl,” which embodied the employment relationship between capital and labor, and also through the construction of trade unions and the piloting of labor laws, such as the promulgation of the “Regulations on the Labor and Employment of the Special Economic Zones of Guangdong Province,” to restrict capital’s exploitation of labor and to limit capital’s exploitation. The promulgation of the Regulations on Labor Laws in the Special Economic Zone of Guangdong Province to limit the uncontrolled expansion of capital demonstrated the critical application of the law of surplus value under the socialist system.

Shenzhen Red Culture is inextricably linked to the history of the development of various areas in Shenzhen, including the history of the development of Chung Ying Street. The history of the development of Chung Ying Street in Shenzhen reveals the contrast between the colonial and socialist economies. During the British period, Shatoujiao Street in Yantian District practiced the monopoly of opium and the drudgery trade, reflecting the bloody nature of the primitive accumulation of capital. In contrast, after the establishment of New China, from taking the road of industrialization and development, developing collective economy, to Deng Xiaoping’s establishment of the Shenzhen Special Economic Zone and the implementation of



socialist market economy, Shenzhen's level of scientific and technological innovation, level of economic development, and high-quality development of Guangdong, Hong Kong and Macao Greater Bay Area have attracted the world's attention. The historical transformation of Chung Ying Street and the difference in development between the north and the south confirm the superiority of the socialist system.

## **2.5. “The Story of Spring” in Shenzhen, interpreting the essence of socialism**

Shenzhen as the frontier of reform and opening up, the construction of the Shenzhen Special Economic Zone (China World Trade Center, Ruzi Ox sculpture) is the material carrier of the red culture formed in Shenzhen in the practice of reform and opening up, and the construction of the Qianhai Advanced Demonstration Zone of Socialism with Chinese Characteristics elaborates on the historical process of socialism in the past 500 years. The ideas in Chapter 6 of the Principles course are compatible with each other and can be organically integrated.

The red culture of Shenzhen was born in the practice of Shenzhen's revolution and reform era. The “one-story building in three days” of the China World Trade Center embodies the advantages of socialism in concentrating its strengths to do great things, and the GDP of Shenzhen of 3,680,187,000,000 yuan in 2024 fully confirms the law of socialist development. The upgrading of Shenzhen from a special economic zone to an advanced demonstration zone of socialism with Chinese characteristics, encompassing economic, political, cultural, social, and ecological changes across the board, reflects the superiority of the socialist system and is a vivid realization of the Marxist revolutionary concept of “comprehensive social progress.”

Scientific socialism holds that the replacement of capitalism by socialism is an inevitable trend in history. Shenzhen Red Culture is part of the development of socialism in China, and it has witnessed the spread and practice of socialist ideas in the Shenzhen area. From the early revolutionary activities to the socialist construction period, the people of Shenzhen, under the leadership of the Communist Party of China (CPC), have actively explored the road suitable for local development, reflecting the process of following the basic principles of scientific socialism and continuously exploring the laws of socialist development in practice, such as the rapid development of Shenzhen after the reform and opening up of the country, which is an embodiment of the superiority of the socialist system and the fruit of exploring the laws of socialist development.

## **2.6. The Shenzhen proposal for Chinese-style modernization, pointing to the epochal coordinates of the lofty ideals of communism**

Revolutionary forces such as the Dongjiang Column fought for the establishment of a fair and just society, and this aspiration and pursuit coincided with the lofty ideals of communism. In the revolutionary era, the forefathers struggled to realize national independence and people's liberation, and to establish a society without exploitation and oppression, which was the concrete embodiment of the communist ideal at that time. The red culture of Shenzhen contains the aspirations and pursuits of the revolutionary forefathers for a better future, and the values of fairness, justice, and people's happiness. Nowadays, Shenzhen is advancing in the construction of socialist modernization, and moving towards the realization of the Chinese dream of the great rejuvenation of the Chinese nation, which is also striving towards the lofty ideals of communism, and closely combining the lofty ideals of communism with the common ideals of socialism with Chinese characteristics.

According to scientific socialism, “in place of the old bourgeois society, with its classes and class antagonisms, there will be a union in which the free development of each individual is the condition of the

free development of all” (*Germanic ideology*), and Marx looked forward to a new communist society in the future, stating that the realization of communism is the inevitable trend of historical development. The red culture of Shenzhen combines the qualities of “breaking down the old” and “establishing the new,” demanding the overthrow of oppression, emancipation of the mind, and emphasizing institutional and technological innovation, which is in line with the complete connotation of the social revolution. It also embodies the spirit of unity and cooperation of the proletariat throughout the world in order to build a union of free people. “Proletarians of the world unite” (*The Communist Manifesto*), the Dongjiang Column rescued allied forces and international friends, among which the rescue of American pilot Lieutenant Kerr is the most legendary, demonstrating the spirit of proletarian internationalism. Shenzhen’s contemporary practice of “Belt and Road” hub construction: Shenzhen’s Shekou Port, the China-European Union (CEU) shuttle train, and other practices of global connectivity embody Marx’s theory of “world history,” that is, the development of productive forces will inevitably break the geographical limitations and promote the construction of a community of destiny for mankind.

### **3. The contemporary value of the Principles course of vocational undergraduate courses in Shenzhen Red Culture fusion Bay Area characteristics**

Shenzhen Red Culture is organically integrated into the teaching of the vocational undergraduate “Principles” course with Bay Area characteristics, which has an important value of the times.

#### **3.1. Improving the theoretical and practical teaching effects of the vocational undergraduate Principles course**

The organic combination of Shenzhen Red Culture and the teaching of the vocational undergraduate Principles course is conducive to the enrichment of the content and innovation of the teaching form of the vocational undergraduate Civics course. Shenzhen red story is a vivid reality material, integrated into the Principles course from the content and form of the resource library, helps to improve the vocational undergraduate Principles course of theoretical teaching and practical teaching effectiveness. It helps to build a new pattern of “research, performance, appreciation, and lecture” with multi-departmental collaboration, multi-resource integration, multi-form development, and multi-platform promotion, and to utilize the combination of “online + offline” to promote the construction of the school’s systematic education project.

#### **3.2. Creating a special vocational undergraduate Civics and Political Science course in Guangdong, Hong Kong, and Macao**

Relying on the results of the construction of Shenzhen Red Base, promote the effective integration of the red culture of Shenzhen SAR into the Principles course, and strive to create a “red + theory + practice” high-quality course, and promote the construction of the Shenzhen Red Brand Creation Project. It helps to demonstrate and lead and radiate other universities to explore the red cultural resources of Shenzhen to be integrated into the Principles course and continuously deepen the reform and development of the course; it helps to create a teaching text material with prominent elements of ideology and politics, manifesting the value of the times, and obvious effect of educating people, and helps to promote the construction of the Shenzhen Red Gene Inheritance Project.

### **3.3. Helping to promote the inheritance of the red gene and the cultivation of a sense of family and national identity among young people in the Bay Area**

Based on the fundamental task of promoting moral education, based on the excavation, collation, and dissemination of Shenzhen red cultural resources, endowed with contemporary characteristics and value connotations, organically integrated into the teaching system of the “Principles” course, and helped to create a “red + theory + practice” ideological classroom. Reform the assessment system of the Principles course, strengthen the students’ ability to improve and value shaping with the OBE concept, so that the new era of college students in Shenzhen red cultural cultivation can inherit red genes, continue the red bloodline, and cultivate a sense of family and country.

## **4. Conclusion**

Shenzhen Red Culture includes the advanced culture formed in Shenzhen during the period of revolution and reform and opening-up, which is intrinsically compatible with the teaching of the vocational undergraduate course “Basic Principles of Marxism” with Bay Area characteristics and can be organically integrated. It is highly necessary to effectively integrate Shenzhen Red Culture into the teaching of the Bay Area vocational undergraduate “Principles” course to create a Bay Area characteristic vocational undergraduate Civics and Politics gold course.

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## **Disclosure statement**

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# The Impact of Artificial Intelligence Technology on Contemporary Music Artists

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**Abstract:** With the continuous development and maturation of artificial intelligence (AI) technology, the influence on music artists is becoming increasingly prominent. While a large number of musicians have benefited from AI technology and achieved considerable success, there are also many who have fallen into difficulties due to the emergence of AI technology. This article expounds the positive and negative impacts that artificial intelligence technology has brought to modern music artists based on the phenomena in reality. This paper will prompt music artists to think about how to use technological means to bring convenience to themselves. At the same time, they will also take a series of actions to avoid risks and minimize the adverse impact of artificial intelligence technology on music artists.

**Keywords:** Contemporary music artist; Artificial intelligence music; Music marketing; Music market environment

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## 1. Introduction

The emergence of artificial intelligence (AI) technology can be traced back to the last century <sup>[1]</sup>. With the continuous development of technology, AI has been extended to various fields in just a few decades. As the breadth of AI applications expands, the music industry has the opportunity to benefit as well. Many AI companies around the world have developed and launched various AI music applications, which cover all aspects of music creation, music promotion, music performance, etc. <sup>[2]</sup>. Almost all parts of the music industry are affected by AI to varying degrees. This article briefly analyzes the impact of AI on music artists from two aspects. The first part briefly outlines the positive impact of AI on music artists from the three aspects of AI creation, AI marketing, and AI copyright protection. The second part shows that even though music artists enjoy the convenience brought by AI, they are also negatively affected. The rapid development of AI technology has brought huge employment pressure to musicians, the simple music production process makes the average professional level of musicians show a downward trend, and the quality of work cannot be guaranteed. Artists who seem to have more opportunities are actually taking on greater and greater responsibilities.



## **2. AI is the music artist's right-hand man**

The use of AI in music is well established; it can be involved in the production of works, record marketing solutions, record tracking, and many other segments <sup>[3]</sup>. These AI technologies not only provide great convenience to musicians in their daily work, but also provide more options for musicians and music marketing strategies and career development.

### **2.1. AI is a catalyst for musical works**

The emergence of AI technology provides an easier way to make songs, and it has increased the production speed of music work, like a catalyst. For a popular song without using any AI technology, the musician will take several months to write the lyrics and compose the music, plus the rehearsal of the accompaniment and other links, creating a new one may take half a year or even a year. More complex classical music and symphony will take more time. AI has changed this phenomenon and greatly improved production efficiency. Taking the aspect of arranging music as an example, in 2017, Sony CSL Research released Flow Machines, an AI music program, Flow Composer—an arranging application in the series of programs, which attracted the attention of the community <sup>[4]</sup>. The app currently covers five main functions: automatic composition, interactive composition, harmony rearrangement, variations, and play. The musician can enter different keywords or pieces of music according to their needs, and Flow Composer will generate several different target arrangements for the musician to choose from. There are many composer companies like this in the market, such as Google Experiments: Music and AI, ORB Composer, IBM Watson Music, etc. With the help of this arranging software, musicians can get many different arrangements in a day with the help of a computer, which greatly increases their efficiency <sup>[5]</sup>. Today, the number of companies in the AI music industry is increasing significantly and already covers almost all aspects of music production, including lyric writing, composing, arranging, singing, and more. AI is becoming increasingly important to music artists, becoming the perfect assistant for their work.

### **2.2. AI and music marketing**

Scott Cohen is an opinion leader in the music industry who sees the potential impact of technology on the prospects of the music industry. In his keynote speech at the Eurosonic Nooderslag conference, he believes that every decade, something happens that has a profound impact on the music industry <sup>[6]</sup>. In my opinion, AI is that important science and technology for changing the music industry, its emergence has helped musicians open new ways of music marketing. AI can transform customer data and activity into actionable digital information, enabling more relevant and personalized cross-channel consumer engagement <sup>[7]</sup>. In the past, the promotion of musicians and music works largely depended on third parties (usually record companies or brokerage companies). They use a series of activities such as distribution, press releases, radio station promotion, TV station and variety show promotion, etc., but these activities must rely on strong capital, and music artists often have to sign unequal treaties with party A in order to obtain limited promotion channels. This means that it is difficult for a music artist to present their musical works to the audience with their own efforts. But now that the entire music market is developing towards online music and mobile devices, the once centralized and powerful traditional media has been fragmented into more decentralized new media channels. The channels through which users can access music works are diversified and can be social media, music platforms, and so on. Musicians can choose to upload their own music to the platform and the AI will now categorize the work according to the algorithms set by the platform according to style, tags, genre, and other characteristics, and then rely on the big data collected to push the work to the music listeners that best match the work. This allows

music artists to market themselves and at the same time to observe their fan base (age, geography, gender, etc.) at any time and from anywhere, which helps music artists to adapt their development strategy at any time<sup>[8]</sup>. In addition to this, AI helps music artists to be more likely discovered by A&R. In the past, sorting through music and finding potential unsigned artists has always been an extremely difficult task; in today's age of streaming music, the problem is even more serious. Industry leaders have identified this problem and are using AI technology to solve them, with Warner Music Group acquiring an AI company to find promising talent. Apple has also acquired a start-up specializing in music analytics to support its A&R process. So, with the advent of AI, artists have more avenues to market themselves and a greater chance of being discovered by good labels, and the relationship between artists and labels is no longer one-way and unequal, but a two-way street.

### **2.3. Better protection of rights and interests**

AI has achieved a major breakthrough in protecting the copyright of music artists, and better helps music artists protect their copyright rights and economic benefits of their works. The traditional way of copyright protection is mainly to maintain music copyright through the law, digital system, copyright registration, and other means. Although these methods can protect the legitimate rights and interests of music copyright, they are not perfect, and there are many limitations and insurmountable problems. For example: In terms of legal protection, the legal procedures and systems of each country are different, and music artists will encounter many unpredictable difficulties in cross-border rights protection; In addition, traditional copyright protection methods require a lot of labor force, the high cost of money and time also hinders some music artist to protect their works. With the continuous development of AI technology, more and more innovative protection methods can bring more possibilities for music copyright protection. For example, (a) Data mining (DM) technology: It extracts music copyright information from large-scale data sets, monitors infringements, and predicts infringement trends, etc.; (b) Machine learning (ML) technology: It develops music copyright identification and digital watermarking technology, monitor and identify infringements, and automate copyright management and maintenance tasks<sup>[9]</sup>. When the copyright is well protected, it means that the economic benefits of musicians will be guaranteed, and AI will try to ensure that music artists receive copyright fees as much as possible.

## **3. Potential crises and unknown challenges**

However, despite the advantages being very useful, the continuous development and application of AI in the music industry seem to bring some difficult problems that people have not thought of. In recent years, AI has repeatedly become a hot topic discussed by insiders in the music industry, such as the issue of music copyright ownership of AI works, the convergence of music works caused by AI, and the gradual simplification of the music market. For music artists, they themselves will also be negatively affected by AI technology.

### **3.1. Soaring employment pressure**

Hans Abbing pointed out in his book *Why Are Artists Poor? The Exceptional Economy of the Arts* that the art market has a special economic model, and the winner-take-all market dominates the art field, which means that many competitors are attracted to this market<sup>[10]</sup>. Everyone firmly believes that they will become the winner in the market and obtain most of the resources and money. Plus, the first part mentioned, various types of music production software launched by music companies on the market provide a shortcut for a large number of music lovers to enter the music market, which has greatly lowered the threshold of the music industry. Even if a music lover does not have very professional knowledge of music theory, they can use this music production software

to be a professional music artist. Therefore, the temptation of high returns in the industry and the simplification of music creation led to it being inevitable that there would be more and more musicians in the market. According to statistics from the U.S. Bureau of Labor Statistics, in 2003, the number of musicians signed by US record companies was 2.93 times that of independent musicians. By 2012, the number of independent musicians was 9.63 times that of signed musicians. In ten years, the number of independent musicians has increased by 6.1 times. Music works have grown accordingly. According to Spotify's official data, there are nearly 40,000 songs uploaded to Spotify every day, and more than 10 million new works are added every year. According to the data released by Tencent musicians in July 2017, 60,000 musicians uploaded more than 100,000 albums on the platform; according to NetEase Cloud Music's data in May 2018, the number of NetEase musicians registered exceeded 50,000, and their uploaded works exceeded 1 million <sup>[11]</sup>. In addition, the birth of AI music artists has also intensified the competition among musicians. For example, Aiva, the most prominent in the field of AI composition, is one of the earliest composers in the field of AI to gain world status. Aiva specializes in the creation of classical music. After reading a large number of works by famous composers such as Beethoven and Mozart, and after in-depth learning, it can finally complete classical melodies in a few minutes. After the continuous evolution of AI composers, the songs created by AI musicians today can be used in movies, advertisements, etc. For many films, music, and commercial music that do not require complex arrangements, AI music has become the first choice for businesses, because AI music not only saves time but also reduces a lot of costs. AI musicians and music production software are important factors that intensify competition in the music industry. In recent years, some musicians have been affected by them. If there is no better way to alleviate this phenomenon, the situation of music artists will become more and more difficult.

### **3.2. Low threshold of the music industry and serious homogeneity of songs**

We have to admit that AI makes it possible for every music lover to become a music artist, but it also lowers the overall level of music artists in the entire music industry. The convenient music production method makes some musicians no longer pay attention to improving their professional music knowledge and skills. With the help of rich music resources on the Internet, they have all kinds of beats and materials, and they can combine a song by themselves after buying them together. They believe that music knowledge and skills are no longer the core competitiveness in this Internet age, but are replaced by traffic, and seizing the preferences of the market is an important condition for becoming a winner in the music industry. Currently, the famous American singer Lil Nas X spent \$30 to buy a beat, created a song called 'Old Town Road' at home, posted it on the Internet by himself, and then spread the popularity through short videos. It took him less than two minutes to go from being an independent musician to overturning the American music scene <sup>[12]</sup>. No attempt to disparage the artist or the song here, but to use this phenomenon to point out that people now make overnight fame the lifelong pursuit of their musical careers. Today's musicians are more impetuous than before. In the past, in order to make a good song, musicians practiced their basic skills hard. Only after they have solid basic skills can they think about making money. Many musicians nowadays have not even learned the basic skills, but already start thinking about selling songs. In this way, selling songs is more about fighting for resources and routines than about work. With the help of AI's huge database and accurate song recommendations, music artists get the most exposure, but the possible consequence is that music artists write songs according to AI recommendation algorithms in order to gain more network exposure, and the quality of songs is difficult to guarantee, the homogenization is serious, the songs we listen to are becoming more and more similar, losing their human characteristics, and are more like being manipulated by technology.

### 3.3. More complex roles and increased responsibilities

The development of technology has digitized the music industry, and the distribution channels and revenue methods of work have also been dispersed. Behind the new opportunities lies a greater burden. Music artists juggle more work, or tap new sources of income, take more risks, and take on more career management responsibilities, often for less than before<sup>[13]</sup>. Keeping pace with the times, record companies have expanded their publicity departments, targeting various social platforms, music platforms, and follower groups, and developed different promotional programs.

For music artists who cooperate with music companies, they only need to create works according to the instructions of their superiors and complete various promotional activities arranged by the company, without worrying about the number of new songs being listened to, the sales of albums, etc. But for independent music artists who rely on AI technology to survive, they avoid record companies, and while enjoying the benefits of AI technology in terms of creation and marketing, it also brings some changes to their identities. Producers of musical compositions become creators, performers, promoters, accountants, and more. Thomson show relative information in his article “Roles, revenue, and responsibilities: The changing nature of being a working musician” that more than 5,000 artists were being surveyed about the number of roles they believed they played in their musical careers, many survey respondents chose the term “multiple roles” an option<sup>[14]</sup>. **Figure 1** proves the above conclusion, more than 70% of the participants chose two/three/four roles. It can be seen that, compared with the traditional music industry, contemporary individual music artists need to do more work and take on more responsibilities.

Role	Frequency	Percentage
Composer	2,660	49.5
Recording artist	2,200	40.9
Performer	4,474	83.2
Salaried player <sup>a</sup>	452	12.9
Session player	2,696	50.1
Teacher	2,858	53.2
Administrator <sup>a</sup>	815	23.4

Note. More than one answer allowed. Money from Music Survey, Sept. 6–Oct. 28, 2011. N = 5,371.

<sup>a</sup>For salaried player and administrator questions, N = 3,485.

**Figure 1.** The role played by a musician

## 4. Conclusion

In this paper, we mainly focus on the theme of AI music and explore the impact of the emergence of AI music on music artists. In the positive impact section, this article lists three manifestations that AI benefits music artists: simplifies the production process of music works and improves the creative efficiency of music artists; helps music artists achieve personalized and more comprehensive marketing; better protects the copyright of music artists and benefits. With the widespread application of AI in the music industry, we have to admit that its negative impact is becoming more and more obvious: the simplified music production process not only increases the competition among artists and leads to serious employment pressure, but also is not conducive to



the improvement of the artist's ability. AI enables music artists to achieve self-marketing and breaks the single identity of music artists. They often play more roles and do more work. On the whole, in the past ten years, music artists have enjoyed the convenience and more opportunities brought by AI. What needs to be considered in the next decade is how to minimize the negative impact of AI technology or develop AI in new fields to benefit music artists.

## Disclosure statement

The author declares no conflict of interest.

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# Artificial Intelligence as Co-Creator: Redefining Creative Identity in Design Education

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**Abstract:** This study examines how generative artificial intelligence (AI) reshapes creative identity in design education. Drawing on post-humanist and network-based theories, it frames AI as a cognitive collaborator in ideation and authorship. Mixed-methods data reveal student anxiety and stylistic confusion, contrasted with designers' adaptive strategies. The AI-Cognition-Identity framework supports curricula that promote reflective, ethical, and epistemically informed AI-integrated pedagogy.

**Keywords:** Generative AI; Design education; Creative identity; Authorship; Post-humanism; Actor-Network Theory; Aesthetic judgment; Ethical reasoning; Mixed methods; Pedagogy

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## 1. Introduction

Generative artificial intelligence (AI) tools such as Midjourney and DALL·E are no longer peripheral to design practice. They have become embedded in creative workflows, altering how ideas are generated, evaluated, and realized. More than accelerating production, these systems provoke fundamental shifts in how designers understand authorship, agency, and creative identity.

This study investigates how generative AI influences creative identity formation in design education. It examines a broader shift from authorship as execution to authorship as curatorial negotiation within technologically mediated environments. In this context, creative identity refers to the evolving relationship among conceptual intent, stylistic coherence, and perceived authorship, shaped through interactions between humans and AI. Unlike traditional studio pedagogy, which emphasizes reflective practice through intentional decision-making and iterative refinement<sup>[1]</sup>, AI-mediated workflows introduce ambiguity, distributed agency, and algorithmic influence.

This inquiry asks whether AI extends creative agency or destabilizes identity, particularly in educational settings where conceptual frameworks are still developing. These changes raise urgent questions not only about what AI can generate but also about how it reshapes cognition, aesthetic judgment, and self-perception in design

learning.

Three research questions guide this study:

- (1) How do students conceptualize the role of generative AI in design education?
- (2) In what ways does AI affect students' aesthetic judgment, authorship, and identity?
- (3) How do early-career designers navigate AI in applied settings?

By comparing student and practitioner perspectives, the study identifies tensions between technical functionality and reflective authorship. It introduces the AI–Cognition–Identity model as a pedagogical framework for fostering algorithmic literacy, ethical reasoning, and intentional creative identity in design education.

## **2. Theoretical background**

### **2.1. Theoretical framework**

This study draws on three intersecting frameworks: Post-humanism, Actor-Network Theory (ANT), and Distributed Cognition. Together, they conceptualize generative AI as an active agent in creative processes. These perspectives challenge anthropocentric models by emphasizing that cognition, authorship, and identity are co-constructed through interactions between humans and technological systems. Haraway's cyborg metaphor and Hayles's notion of decentralized identity suggest that creative agency is not confined to the individual but emerges across networks of human and non-human actors<sup>[2,3]</sup>. Actor-Network Theory builds on this idea by positioning AI as a non-human actant that influences decisions and outcomes in meaningful ways<sup>[4]</sup>. In this study, these theories inform how authorship and agency are interpreted in AI-mediated design processes.

### **2.2. Generative AI in design contexts**

Platforms such as Midjourney and DALL·E now support rapid ideation and image generation in design workflows. Zhou *et al.* argued that these tools reconfigure early-stage design thinking by positioning AI as a conceptual partner<sup>[5]</sup>. Yet, Schönauf-Fog *et al.* observed that academic programs often prioritize output over epistemic reflection, leaving students unaware of how AI mediates originality and creative agency<sup>[6]</sup>.

### **2.3. Cognitive mediation and authorship complexity**

To further understand AI's epistemic role, this study draws on Distributed Cognition Theory, which posits that cognition unfolds through interaction with tools and environments<sup>[7]</sup>. In design, this suggests that thinking is not internal but co-constructed. Candy and Edmonds emphasized the importance of situated engagement, while Hayles framed identity and authorship as emergent and relational<sup>[3,8]</sup>. Zhou *et al.* similarly highlighted how designers now curate and contextualize AI outputs rather than originate every element, shifting authorship from execution to interpretive agency<sup>[5]</sup>.

### **2.4. Affective and ethical tensions**

Despite functional benefits, students often report discomfort with AI's opaque logic and ambiguous authorship boundaries. Concerns about originality, cognitive detachment, and ownership reflect what Lu and Chan identified as affective tensions that are not purely technical, but also epistemological and emotional<sup>[9]</sup>. These anxieties signal the need for reflective frameworks that help users navigate hybrid authorship and cognitive collaboration.

### 3. Methodology

This study adopted a mixed-methods design to examine how generative AI shapes cognition, authorship, and identity in design education. Grounded in an interpretivist paradigm, the research focused on how meaning emerges through interactions between human users and AI systems, moving beyond tool functionality to explore epistemic, aesthetic, and ethical dimensions of creative practice.

Participants were purposely selected from East Asian and North American design institutions. The quantitative phase involved 13 undergraduate and graduate students specializing in fashion and visual communication design, with national backgrounds including China, the U.S., and the U.K. Their focus areas spanned womenswear, branding, packaging, and digital design. The qualitative phase included semi-structured interviews with seven early-career designers (1–3 years post-graduation), including both independent brand founders and in-house designers, all of whom had experience using AI tools such as Midjourney and DALL·E.

The survey included both Likert-scale and open-ended items, addressing four areas: functional cognition (ideation with AI), aesthetic trust (confidence in outputs), creative identity (views on authorship), and usage intention (future AI adoption). Interviews (approximately 30 minutes) explored participants' AI adoption, integration strategies, stylistic control, and perspectives on authorship and ethics.

Survey results were summarized using descriptive statistics. Interview transcripts were thematically coded using Braun and Clarke's six-phase method<sup>[10]</sup>. Analytical interpretation drew on several theoretical frameworks: decentralized identity<sup>[3]</sup> and reflective authorship<sup>[1]</sup> for authorship; the Technology Acceptance Model<sup>[11]</sup> and AI as a cognitive collaborator<sup>[5]</sup> for stylistic control; and distributed cognition<sup>[7]</sup> alongside Actor-Network Theory<sup>[4]</sup> for human-AI interaction.

All participants provided informed consent, and personal data were anonymized. The combined approach enabled comparative analysis of student and designer experiences and informed the development of the AI–Cognition–Identity model presented in the next section.

### 4. Findings

This section presents findings from student surveys and designer interviews, focusing on three themes: cognitive engagement, authorship perception, and identity formation. These themes were identified through thematic analysis and interpreted using the study's theoretical frameworks.

While students valued AI's efficiency, they often lacked strategies to guide its use critically. Designers demonstrated more intentional workflows and ethical awareness. The sections that follow compare these patterns, highlighting contrasts in agency, authorship, and epistemic confidence.

#### 4.1. Cognitive engagement

Students widely acknowledged AI's utility in accelerating ideation. Student 6 stated, "AI really saves a lot of time," and Student 3 praised its ability to "produce outputs quickly." However, their responses rarely indicated awareness of how algorithms shape design directions. For example, Student 11 asked, "How do I know whether AI images are plagiarized?", revealing uncertainty about training data, authorship, and ownership. Most students treated AI as a task-oriented assistant rather than a thinking partner.

Designers adopted more intentional approaches. Designer 5 used AI to explore complex visual themes, while Designer 3 described revising prompts and post-editing outputs as part of an iterative process. Unexpected results were seen not as failures but as opportunities for discovery. These practices reflect constructivist learning, where knowledge evolves through experimentation and reflective adaptation.

Designer 1 noted that AI sometimes redirected entire projects by introducing unfamiliar visual possibilities. This aligns with Actor-Network Theory, which sees agency as emerging through relations between human and non-human actors. In this context, AI contributes to ideation and shapes meaning alongside the designer.

## 4.2. Aesthetic control and authorship perception

Cognitive and stylistic gaps in student responses highlight the need for metacognitive scaffolding and aesthetic intentionality. Many expressed frustration with AI's failure to reflect their vision, stating, "AI can't express my style" or "Even after tweaking, it still wasn't what I had in mind." These comments reflect reactive engagement, with few using reference images or structured prompting to refine outputs. Designers, by contrast, applied more systematic methods. Designer 4 manually edited over-rendered images, while Designer 5 curated references and iteratively adjusted prompts to sustain stylistic coherence. These practices demonstrate deliberate control and stronger creative authorship.

Students also showed confusion around epistemic ownership. One remarked, "I think the author is me, and also the AI, and also the AI developers," while another noted, "It's hard to see my own marks in it." Such ambiguity contrasts with designers' clearer authorial stances. Designer 6 stated, "I'm still leading the creation," and Designer 2 tailored AI-use disclosure to context. These responses reflect Nelson and Stolterman's notion of reflective authorship, centered on intentionality, selection, and ethical judgment<sup>[1]</sup>.

Students' uncertainty echoes Hayles's theory of decentralized identity, where authorship is distributed across human and non-human agents<sup>[3]</sup>. Lacking curricular guidance, students often default to binary thinking, underscoring the need to cultivate nuanced understandings of shared authorship in post-human learning environments.

## 4.3. Identity anxiety and epistemic gaps

Students frequently expressed discomfort with AI's impact on their creative identity. Student 12 admitted feeling disconnected from increasingly autonomous outputs, while Student 17 questioned the originality of AI-generated content. These comments reveal both emotional unease and an epistemological gap in negotiating hybrid authorship. This reflects Hayles's theory of post-human subjectivity, where identity is distributed across human and machine assemblages<sup>[3]</sup>.

In contrast, designers demonstrated emerging professional identities that incorporated AI as a co-creator. Designer 3 described prompt selection and output refinement as core authorial practices. Designer 7 emphasized context-sensitive disclosure, explaining that ethical transparency depended on audience and project. These approaches align with Lu and Chan's findings on ethical fluency in design and with Nelson and Stolterman's concept of reflective authorship, which emphasizes intentionality and contextual judgment over technical execution<sup>[1]</sup>.

Students' ethical concerns, from fears of creative devaluation to uncertainty about ownership, point to the absence of structured reflection in current curricula. Most were unsure how to assess authorship or communicate AI use transparently. Designers, by comparison, exercised clearer judgment and made strategic disclosure choices. These differences suggest a developmental progression shaped by reflective experience, professional engagement, and institutional guidance.

## 5. Discussion

Drawing from the patterns identified in the above section, this discussion uses the AI-Cognition-Identity model

to synthesize implications for pedagogy, with reference to the theoretical frameworks established earlier. This section interprets findings through the AI–Cognition–Identity model (see **Figure 1**), which compares student and designer trajectories across cognition, authorship, and ethics. It examines three domains: cognitive and aesthetic engagement, authorship and identity, and ethical reasoning. It concludes with pedagogical implications for AI-integrated design education.

[Student Pathway]	[Designer Pathway]
Functional Acceptance "It saves time."	Conceptual Integration "I use AI to generate early sketches and ideas."
Style Disorientation "It doesn't look like mine." "Feels hollow."	Style Regulation "I fine-tune prompts and use reference images."
Blurred Creative Ownership "Is it still my design?"	Creative Authority Assertion "I direct and curate-it's my work."
Ethical & Career Anxiety "Will clients prefer AI over human designers?"	Strategic Ethical Navigation "Whether I disclose AI use depends on context."

**Figure 1.** Student and designer pathways in engaging with generative AI

## 5.1. Cognitive engagement

Students acknowledged AI's utility in early ideation. One noted it "opens up design directions," echoing Davis's concept of perceived usefulness <sup>[11]</sup>. However, most showed limited reflection. One admitted to using outputs "as is," with minimal iteration or critical judgment. Few applied metacognitive strategies to guide or evaluate AI's role.

In contrast, designers employed iterative workflows, including prompt development, manual refinement, and stylistic calibration. One emphasized curating outputs within broader conceptual systems. These methods align with Candy and Edmonds's view that experienced creators embed tools in reflective cycles <sup>[8]</sup>, and with Hollan *et al.*'s model of distributed cognition across people, tools, and environments <sup>[7]</sup>. AI thus aids ideation while reshaping cognition.

Designer 1 described how unfamiliar AI outputs redirected an entire project, opening new conceptual paths. This shift illustrates Latour's notion of non-human actants, entities that, although not sentient, influence outcomes through networked agency <sup>[4]</sup>. Generative systems co-construct meaning and affect design decisions.

Stylistic control further distinguishes students and designers. Students often expressed frustration with AI's failure to match their vision, rarely refining prompts or using reference calibration. Designers used deliberate techniques. One stated, "AI helps organize ideas, but the final decisions are mine," while another emphasized post-editing. These practices reflect Zhou, Park, and Hernández's concept of cognitive collaboration, in which designers retain agency by shaping and contextualizing AI outputs <sup>[5]</sup>.

## 5.2. Ethical reasoning

Students expressed significant anxiety about authorship. One questioned whether prompt-based creation constituted authorship, while another suggested the creator could be "me, or the AI, or even the developers." These responses reflect what Hayles described as fragmented identity within posthuman systems <sup>[3]</sup>. Without



conceptual tools to navigate distributed authorship, students struggled to articulate their role in hybrid production.

Designers, by contrast, presented a clearer perspective. One argued that prompt selection and iterative decision-making reflect authorial control, aligning with Manovich's curatorial authorship<sup>[12]</sup> and Nelson and Stolterman's reflective practice<sup>[1]</sup>. Another affirmed, "I lead the creation," emphasizing agency over technical authorship.

Yet curatorial authorship carries risks. As Manovich noted, over-reliance on system defaults can erode critical distance, embedding algorithmic bias into design logic<sup>[12]</sup>. Reflective authorship thus demands not only decision-making but also awareness of how those decisions are shaped by machine systems.

Students' discomfort underscores a broader theoretical concern: the need to reframe authorship as negotiated identity rather than fixed position. Hayles's theory of decentralized identity is relevant here<sup>[3]</sup>, as post-human systems distribute authorship across human and non-human agents. While designers began to embrace this hybridity, students often retained binary views, assigning authorship either entirely to themselves or to AI. This resistance reflects a lack of epistemic ownership: the ability to claim, justify, and ethically account for creative decisions in technologically mediated environments. These practices reflect Candy and Edmonds's process-based ethics, where moral agency is enacted through situated design choices<sup>[8]</sup>.

### 5.3. Identity formation

Ethical concerns surfaced frequently in student responses but often lacked clarity. Student 11 questioned the origin of AI images, and Student 2 worried that AI-assisted work might appear inauthentic. These concerns were rarely linked to broader frameworks of accountability or disclosure. Student 6 expressed anxiety that AI would devalue foundational design skills, reflecting a perceived conflict between tradition and innovation.

Designers articulated more nuanced ethical stances. Designer 2 described disclosing AI involvement based on project type and audience, while Designer 7 emphasized context-specific communication. These practices reflect Lu and Chan's finding that ethical fluency evolves through practice and reflection<sup>[9]</sup>. Rather than viewing AI as ethically neutral or threatening, designers regarded it as a tool whose use could be explained and negotiated.

Post-humanism reframes ethics as distributed responsibility. Haraway and Hayles emphasized that ethical action emerges from situated engagement across networks of human and non-human agents<sup>[2,3]</sup>. Similarly, Candy and Edmonds argued that ethics is embodied through process, not imposed externally<sup>[8]</sup>. Hollan *et al.* supported this by conceptualizing ethical reasoning as embedded within interactional contexts<sup>[7]</sup>. These models suggest ethical literacy must be cultivated alongside technical training, integrated throughout the design process rather than treated as peripheral.

### 5.4. Pedagogical implications

Future curricula may benefit from critical pedagogy<sup>[13]</sup>, encouraging students to examine the sociotechnical conditions underlying AI systems. These findings underscore the need to reform AI-integrated design education through three priorities.

First, curricula should develop algorithmic understanding and authorship literacy. Students must grasp how AI tools work, what data they use, and how outputs are formed. This aligns with distributed cognition theory, which emphasizes knowledge construction through human-machine interaction<sup>[7]</sup>. Literacy can be fostered through prompt deconstruction, image comparison, and model critique.

Second, authorship and identity require reframing. Instead of focusing on execution, students should practice reflective authorship using co-creation logs, authorship mapping, and disclosure strategies that highlight conceptual intent. This reflects Hayles's view of decentralized authorship, where creativity emerges from human–AI assemblages<sup>[3]</sup>.

Third, ethical reasoning must be integrated across the design process. Studio courses should use simulations, case studies, and reflective writing to help students articulate ethical considerations in AI-assisted decisions. As Lu and Chan argued, such practices promote critical awareness and support socially responsible design roles<sup>[9]</sup>.

These strategies position the AI–Cognition–Identity model as a foundation for shifting design education toward cognitive agency, curatorial authorship, and ethical judgment in AI-mediated creativity.

## 6. Conclusion

This study introduced the AI–Cognition–Identity framework to examine how generative AI influences cognition, authorship, and aesthetic judgment in design education. Findings show that while students valued AI for ideation, they struggled with authorship, style, and ethics. Designers demonstrated more intentional integration and greater creative control.

These contrasts highlight the need for design education to move beyond technical skills and foster critical judgment. As creative practice shifts toward curatorial synthesis, curricula must embed reflection, authorship theory, and ethical reasoning. The AI–Cognition–Identity model provides a foundation for such pedagogical reform.

However, this study is limited by a small sample and contextual focus. Future research should explore cross-cultural perspectives and conduct longitudinal or experimental studies to assess identity formation and test curricular interventions in AI-integrated design education.

## Disclosure statement

The author declares no conflict of interest.

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# The Influence of Digital Literacy on College Students' Entrepreneurial Opportunity Recognition: The Moderating Role of Innovation and Entrepreneurship Education

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**Abstract:** To explore the impact of digital literacy on college students' entrepreneurial opportunity recognition, this study conducted a questionnaire survey using the Digital Literacy Scale, the Entrepreneurial Opportunity Recognition Scale, and the Innovation and Entrepreneurship Education Scale. A total of 542 valid responses were collected. The results revealed a significant positive correlation between digital literacy and entrepreneurial opportunity recognition among college students ( $\beta = 0.856, P < 0.01$ ). Further analysis indicated that innovation and entrepreneurship education plays a positive moderating role in this relationship ( $\beta = 0.111, P < 0.01$ ). In other words, the higher the students' scores in innovation and entrepreneurship education, the stronger the relationship between digital literacy and their ability to recognize entrepreneurial opportunities.

**Keywords:** Digital literacy; College students; Entrepreneurial opportunity recognition; Innovation and entrepreneurship education; Talent cultivation; Innovation awareness

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## 1. Introduction

College student entrepreneurship plays a vital role in both individual career development and broader social progress. Against the backdrop of rapid advancements in internet technology and the digital economy, the ability to identify and seize entrepreneurial opportunities has become a core factor determining the success of student entrepreneurship. Recognizing entrepreneurial opportunities requires entrepreneurs to possess sharp market insight, innovative thinking, and sound decision-making abilities—areas in which digital literacy is particularly critical.

Digital literacy refers to an individual's ability to use digital technologies effectively, efficiently, and

securely, encompassing skills such as information acquisition, analysis, evaluation, and creation. Research shows that digital literacy significantly influences key factors such as self-efficacy, cognitive decision-making, and innovation performance <sup>[1,2]</sup>. However, existing studies on the specific relationship and underlying mechanisms between digital literacy and entrepreneurial opportunity recognition remain limited.

This study aims to explore the influence of digital literacy on college students' entrepreneurial opportunity recognition and to analyze the potential moderating role of innovation and entrepreneurship education. The goal is to provide recommendations for higher education institutions to enhance students' ability to recognize entrepreneurial opportunities.

## **2. Concept definitions and hypothesis**

### **2.1. Digital literacy and entrepreneurial opportunity recognition among college students**

In 1994, Israeli scholars first introduced the concept of digital literacy, breaking it down into five dimensions: re-creative literacy, visual literacy, branching literacy, information literacy, and emotional literacy <sup>[3]</sup>. Since 2006, Chinese scholars have actively studied digital literacy and generally agree that it encompasses not only the basic ability to apply digital technologies but also comprehensive skills and cultural competencies such as knowledge creation, sharing, and discernment.

Specifically for college students, digital literacy includes seven core elements: accurate recognition of digital information, acquisition of digital data, communication and exchange of information, data analysis and evaluation, protection of digital security, problem-solving in digital environments, and digital ethics and values <sup>[4]</sup>. Fang and He constructed a digital literacy framework for college students that consists of six dimensions—information and data, communication and collaboration, content and creation, digital life, learning, and development—covering 20 specific competencies <sup>[5]</sup>.

Entrepreneurial opportunity recognition refers to the dynamic, continuously adaptive process through which entrepreneurs perceive, discover, evaluate, and develop business opportunities. It plays a critical role in bridging entrepreneurial intention and action. Research by Yu and colleagues found that self-efficacy, access to resources, and prior knowledge are positively correlated with opportunity recognition <sup>[6]</sup>, with resource acquisition being a key factor linked to digital literacy among students. Peiris *et al.* and Wang proposed that factors influencing opportunity recognition include individual and environmental characteristics, resource accessibility, and social networks <sup>[7,8]</sup>.

In the digital era, digital literacy has become a vital capability for individuals to access information, process data, and make decisions, all of which positively influence college students' ability to identify and seize entrepreneurial opportunities. According to Social Cognitive Theory, individual behavior, cognition, and environmental factors interact; thus, as a cognitive ability, digital literacy affects how opportunities are identified and evaluated <sup>[9]</sup>. Information Processing Theory suggests that individuals' ability to process information determines how they understand and respond to complex situations—students with higher digital literacy are more adept at recognizing potential business opportunities.

Studies have shown that students with strong digital skills perform better in entrepreneurial simulation activities, and digital skills are considered a key dimension of digital literacy. Research by Deci and Ryan indicates that an individual's technical proficiency is positively associated with their willingness to adopt and utilize new technologies—an association applicable to entrepreneurial opportunity recognition <sup>[10]</sup>.

Based on this, the following hypothesis is proposed:



Hypothesis H<sub>1</sub>: College students' digital literacy has a positive impact on their entrepreneurial opportunity recognition.

## 2.2. The moderating role of innovation and entrepreneurship education

Innovation and entrepreneurship education not only cultivates students' innovative thinking and entrepreneurial spirit but also enhances their practical skills. According to a survey conducted among higher education institutions, students who participated in innovation and entrepreneurship education programs scored 35% higher in innovative thinking and entrepreneurial spirit, and 27% higher in practical skills compared to those who did not participate <sup>[11]</sup>. These findings indicate that innovation and entrepreneurship education has a significant positive impact on the development of students' innovation capabilities.

According to Self-Determination Theory, when education satisfies students' needs for autonomy, competence, and relatedness, their intrinsic motivation can be effectively stimulated. A cross-disciplinary meta-analysis found a positive correlation ( $r = 0.65$ ) between the fulfillment of these basic psychological needs and students' intrinsic motivation <sup>[12]</sup>. The enhancement of motivation not only facilitates further development of digital literacy but also improves the ability to recognize entrepreneurial opportunities.

Based on this, the following hypothesis is proposed:

Hypothesis H<sub>2</sub>: Innovation and entrepreneurship education positively moderates the relationship between college students' digital literacy and entrepreneurial opportunity recognition.

## 3. Research subjects and methods

### 3.1. Subjects

This study used the Wenjuanxing platform, a Chinese questionnaire website, to design, distribute, and collect questionnaires, gathering a total of 548 responses. After strict screening, 6 invalid questionnaires were excluded, resulting in 542 valid questionnaires, with an effective response rate of 98.90%. Among the valid samples, there were 251 males (46.3%) and 291 females (53.7%). Regarding age composition, 186 respondents are under 22 years old, 212 are between 22 and 25 years old, 57 are between 26 and 28 years old, 72 are between 29 and 34 years old, and 15 are 35 years or older. In terms of educational background, 311 have a bachelor's degree (57.4%), 217 have a master's degree (40.0%), and 14 have other qualifications (2.6%). Regarding household income, 33 people have a monthly income below 10,000 yuan (6.1%), 107 between 10,000 and 30,000 yuan (19.7%), 135 between 30,000 and 50,000 yuan (24.9%), and 267 above 50,000 yuan (49.3%).

### 3.2. Instruments

The scales used in this study are shown in **Table 1**. Based on relevant research, demographic variables included gender, age, household income, education level, and whether relatives or friends have entrepreneurial experience. Additionally, to examine the impact of motivation on college students' entrepreneurial opportunity recognition, two items were specifically added: "I desire to realize my life's value" and "I strongly want to make a greater contribution to economic and social development." Among the measurement tools used in this study, the Cronbach's alpha coefficients are as follows: college students' digital literacy <sup>[5]</sup> 0.97, innovation and entrepreneurship education <sup>[13]</sup> 0.93, and entrepreneurial opportunity recognition <sup>[11]</sup> 0.92.

### 3.3. Statistical analysis

This study used SPSS 25.0 software for data analysis, mainly including descriptive statistics, Pearson correlation

analysis, and multiple regression analysis to evaluate the relationships among college students' digital literacy, entrepreneurial opportunity recognition, and innovation and entrepreneurship education.

## 4. Research findings and statistical analysis

### 4.1. Descriptive statistics and univariate analysis of college students' entrepreneurial opportunity recognition

In the study sample, the scores for college students' entrepreneurial opportunity recognition ranged from 3.37 to 4.72. Male students scored higher than female students. The effect of students' age on entrepreneurial opportunity recognition was relatively small. Students from average-income families showed little difference compared to those from low-income families. Students with a strong desire to realize their life value scored higher than those with moderate or general levels of desire. Students with a low desire to make greater contributions to economic and social development scored lower, while those with moderate to high desires scored higher and similarly among each other. Students who had relatives or friends with entrepreneurial experience scored higher than those who did not.

Analysis of variance showed that differences in entrepreneurial opportunity recognition among students by age, family income, desire to realize life value, education level, desire to contribute to economic and social development, and whether they had entrepreneurial relatives or friends were statistically significant ( $P < 0.05$ ). Students aged 23 to 34 had the highest awareness of entrepreneurial opportunity recognition. The stronger the desire to realize life value and to contribute to economic and social development, the higher the level of entrepreneurial opportunity recognition. Additionally, students with entrepreneurial relatives or friends showed relatively higher levels of entrepreneurial opportunity recognition.

### 4.2. Correlation analysis of college students' digital literacy, entrepreneurial opportunity recognition, and innovation and entrepreneurship education

Using entrepreneurial opportunity recognition as the dependent variable, gender, age, education level, desire to realize life value, and desire to make greater contributions to economic and social development as control variables, and college students' digital literacy as the independent variable, Model 3 in **Table 1** shows that college students' digital literacy is significantly positively correlated with entrepreneurial opportunity recognition ( $\beta = 0.824$ ,  $P < 0.01$ ). Therefore, hypothesis  $H_1$  is supported.

**Table 1.** Results of hierarchical regression analysis

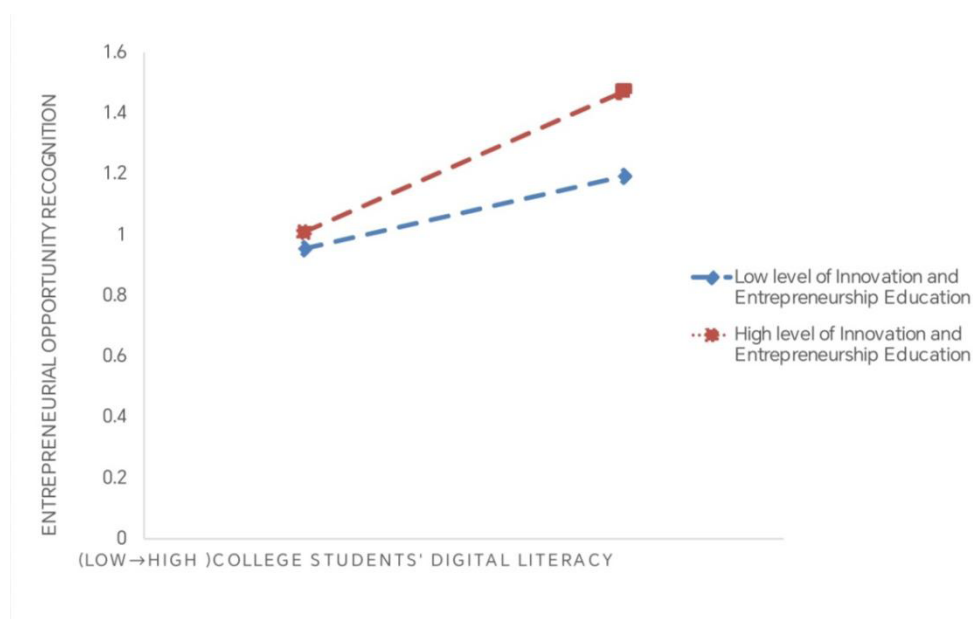
Variables	Innovation and entrepreneurship education		Entrepreneurial opportunity recognition		
	Model 1	Model 2	Model 3	Model 4	Model 5
Control variables					
Gender	-0.009	-0.009	-0.005	-0.005	0.003
Age	0.051	0.005	0.089**	0.043	0.045
Education level	0.113	0.040	0.103*	0.029	-0.007
Desire to realize life value	0.306	-0.010	0.290**	-0.029	-0.008
Desire to make a greater contribution to economic and social development	0.479	0.083	0.440**	0.041	0.011

**Table 1 (Continued)**

Variables	Innovation and entrepreneurship education		Entrepreneurial opportunity recognition		
	Model 1	Model 2	Model 3	Model 4	Model 5
Independent variable					
College students' digital literacy		0.818**	0.824**	0.380**	0.451**
Moderating variables					
Innovation and entrepreneurship education				0.542**	0.555**
Digital literacy $\times$ innovation and entrepreneurship education					0.673**
$R^2$	0.047**	0.628**	0.082**	0.793**	0.800**
$\Delta R^2$	0.047**	0.586**	0.072**	0.704**	0.779**
F	4.362**	129.152**	7.832**	181.474**	235.093**
$\Delta F$	4.362**	836.260**	7.832**	1122.91**	178.972**

### 4.3. Moderating effect test

To verify hypothesis H<sub>2</sub>, this study employed a three-step hierarchical regression analysis and used the interaction term between variables to test the moderating effect of innovation and entrepreneurship education. Entrepreneurial opportunity recognition was set as the dependent variable, with control variables, college students' digital literacy, innovation and entrepreneurship education, and their interaction term introduced sequentially. The interaction between college students' digital literacy and innovation and entrepreneurship education was significant, indicating that innovation and entrepreneurship education positively moderates the effect of digital literacy on entrepreneurial opportunity recognition. Therefore, hypothesis H<sub>2</sub> is supported. The moderation effect is illustrated in **Figure 1**.



**Figure 1.** The moderating effect of innovation and entrepreneurship education on college students' digital literacy and entrepreneurial opportunity recognition

## 5. Conclusion

Digital literacy has a significant positive impact on college students' entrepreneurial opportunity recognition ( $\beta = 0.824, P < 0.01$ ), and innovation and entrepreneurship education plays a positive moderating role in this relationship ( $\beta = 0.111, P < 0.01$ ). Universities should emphasize the education of digital literacy among students and integrate it into the innovation and entrepreneurship education system, enhancing digital literacy through relevant courses and practical activities. At the same time, a comprehensive innovation and entrepreneurship education system should be established to strengthen the combination of theory and practice and improve the ability to recognize entrepreneurial opportunities. Additionally, attention should be paid to students' entrepreneurial motivations; educational interventions can be used to enhance achievement motivation and social responsibility motivation, thereby stimulating entrepreneurial passion. The results of this study provide valuable references for innovation and entrepreneurship education in universities, but also have limitations. The research sample is limited to college students, and future studies can expand to broader populations. The research method mainly relies on questionnaires, and future research could incorporate interviews and case analyses to explore the process and influencing factors of entrepreneurial opportunity recognition more deeply.

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## Disclosure statement

The authors declare no conflict of interest.

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# Exploration of the Cultivation Mode of Applied, Composite, and Innovative Talents in General Medicine under the Background of New Medicine

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**Abstract:** The construction of new medicine is a strategic plan proposed by the Party and the state for the development of medical education in the new era, which brings new opportunities and challenges to the cultivation of general medical talents. Based on the connotation of the new medical construction, we will promote the construction of a comprehensive medical talent training system. By creating a characteristic general education curriculum system, building a high-level clinical practice teaching base, creating an innovation and entrepreneurship education platform for the First Affiliated Hospital of Xi'an Medical University, and reforming and improving the internal incentive mechanism for teachers, we aim to cultivate comprehensive medical talents who are “useful, competent, capable, and able to stay,” and contribute to the construction of a healthy China.

**Keywords:** New Medicine; General medical education; Talent cultivation

**Online publication:** July 3, 2025

## 1. Introduction

The report of the 19th National Congress of the Communist Party of China proposed two important strategies: building a strong education country and implementing a “Healthy China.” Medical education, as an important link between the two major strategies, shoulders the mission of “Healthy China” for national prosperity and strength, while also undertaking the task of building an educational powerhouse for the great rejuvenation of the Chinese nation<sup>[1]</sup>. Therefore, the cultivation of order-oriented general practitioner students with full life cycle health care capabilities, high job competence, and grassroots service awareness must be based on the standards of clinical medical education, closely focusing on the goal of “new medicine” construction, and actively exploring the reproductive model of general practice.

## **2. Deeply understanding the connotation of the “three new” aspects of new medicine and promoting the construction of a talent training system for general practice medicine**

Medical education carries the mission of cultivating medical and health talents, and is closely related to the health of the whole nation. The purpose of medical education is to cultivate qualified medical talents, provide high-quality medical and health talent resources for society, and meet the health needs of the people <sup>[2]</sup>. In September 2020, the General Office of the State Council issued the “Guiding Opinions on Accelerating the Innovative Development of Medical Education” (Guobanfa [2020] No. 34), proposing to “place medical education in an important position related to the priority development of education and health care undertakings, based on the basic national conditions, guided by service needs, taking the construction of new medicine as the starting point, focusing on innovating institutional mechanisms, classifying and cultivating research-oriented, compound and application-oriented talents, comprehensively improving the quality of talent training, and providing strong talent guarantee for promoting the construction of a healthy China and safeguarding people’s health” <sup>[3]</sup>. This major deployment has sounded the horn for the construction of a new medical system in China in the new era.

The new era of medicine requires the development of “new medicine,” which refers to the organic integration of the most advanced knowledge and theories in the field of medicine and related disciplines, as well as the most effective practical experience in various clinical specialties, starting from the overall human body. It is also modified and adjusted according to environmental, social, psychological, engineering, and other aspects, making it a new medical system that is more in line with and suitable for human health and disease diagnosis and treatment <sup>[4]</sup>. The new medicine embodies three completely new aspects in medical education. One is the new educational philosophy, which extends medical education from a focus on treatment to prevention and health care, highlighting the concept of holistic health education throughout the entire life cycle and health process. The second is that the new medical field was born in a new era, which emphasizes technological innovation and industrial transformation. It is a development based on and driven by innovation, and the era of technological innovation has provided unprecedented opportunities and impetus for the transformation of the new medical field. Thirdly, the new professional settings will achieve the integration of medicine, engineering, science, and culture, and develop new medical specialties such as precision medicine, translational medicine, and intelligent medicine <sup>[5]</sup>.

The new medical philosophy emphasizes the cultivation of the entire life cycle and health process, which coincides with the goals and job competency system of cultivating grassroots general practitioners. Continuous care is one of the most significant core features that distinguishes general practice medicine from other specialized medicine. This continuous care is not only reflected in the diagnosis and treatment of diseases, but also extends to health services such as prevention, health care, health education, and behavioral intervention during the healthy period. Deeply understanding the connotation of the “three new” in new medicine, promoting medical education and teaching reform guided by the competence of grassroots general practitioners, highlighting the cultivation of full cycle health care ability, and deeply integrating information technology and curriculum construction are the key points to promote the cultivation of grassroots general practitioners in the new era <sup>[6]</sup>. The demand for the construction of new medicine is a new opportunity for the further development of general medical education. Developing general medical education, deepening the reform of rural order-oriented medical student education, and vigorously cultivating general medical talents with the ability to take care of life cycle health are the correct methods to solve the problem of improving life cycle health strategies in

the construction of new medicine.

### **3. Current situation and existing problems of general practice education**

#### **3.1. Unstable ideology of general practice-oriented medical students serving the grassroots**

Targeted medical students work, live, and serve at the grassroots level, and there are certain differences in their career development compared to students with the same educational background. This requires targeted medical students to possess noble medical ethics and dedication. Targeted medical students enjoy national exemptions from tuition fees, accommodation fees, subsidies for living expenses, and targeted employment policies. However, some targeted medical students are influenced by negative ideologies such as utilitarianism, materialism, and hedonism, which lead to their emphasis on practical utility over ideal beliefs, their emphasis on practical rewards over dedication responsibilities, and their unstable thinking and weak will to root themselves in the grassroots and serve the people <sup>[7]</sup>. Therefore, it is necessary to create a distinctive general education curriculum system, integrating medical ethics education and medical humanities education throughout the entire process of medical student training, and cultivating general medical students who can “go down and stay.”

#### **3.2. Further strengthening the cultivation of practical application ability**

The teaching system of applied undergraduate programs must highlight the cultivation of practical abilities, and the cultivation of applied and technical talents requires students to have solid professional skills and outstanding practical application abilities. The process of cultivation should be a gradual integration of theory and practice, and a process of mutual integration between theoretical teaching and practical teaching. Especially in the era of new medicine, modern medical talents not only need to perform medical-related treatment operations, but also need to practice and apply in related fields such as artificial intelligence, information technology, and big data fusion. They should strive for excellence in technology and pursue innovation in practice in order to better promote the development of modern medicine <sup>[8]</sup>. Therefore, relying on the existing clinical training and teaching center, we have further established a comprehensive, specialized, and integrated clinical practice teaching base that is in line with the future development of medical education, in order to cultivate more applied grassroots general medical talents who are “useful and capable” for Shaanxi.

#### **3.3. General medical students have weak innovation and entrepreneurship awareness**

Due to the long class hours and heavy academic tasks of medical students, their employment goals are mainly stable institutions such as hospitals and health institutions. Students generally believe that innovation and entrepreneurship are the behaviors of a few outstanding students who engage in scientific and technological innovation, participate in competitions and win awards, or engage in commercial activities <sup>[9]</sup>. Therefore, most students have weak innovation and entrepreneurship awareness, and lack interest and motivation in innovation and entrepreneurship. We have created a “Western Medicine Affiliated Hospital Innovation and Entrepreneurship Education Platform” to achieve a one-stop experience of “double innovation” resources. Combined with the infiltration of extracurricular activities, scientific research training, subject competitions, and campus cultural environment, we aim to cultivate students’ innovative spirit, entrepreneurial awareness, innovative and entrepreneurial abilities, and entrepreneurial practices. We focus on stimulating innovation and entrepreneurial inspiration and enthusiasm, and improving the implementation effect of innovation and entrepreneurship education.

### **3.4. Insufficient internal teaching motivation among clinical teachers**

Due to various factors such as the hospital's own management system, the actual situation of medical work, the teaching awareness of clinical teachers, and the relatively insufficient emphasis on teaching work, various contradictions between clinical practice and teaching continue to emerge, and there is a lack of internal motivation for teaching work among teaching staff<sup>[10]</sup>. Therefore, it is necessary to explore a systematic, comprehensive, and standardized teacher incentive mechanism to stimulate teachers' attention and enthusiasm for clinical teaching work, in order to solve the problem of insufficient "teaching motivation."

## **4. Implementation strategy for the training mode of applied, composite, and innovative talents in general practice medicine**

### **4.1. Creating a distinctive general education curriculum system**

It is necessary to create a distinctive general education curriculum system, highlighting the humanistic quality education of "loving the grassroots, rooting in the grassroots, and serving the grassroots," integrating medical ethics education and medical humanities education throughout the entire process of medical student training, and cultivating general medical students who can "go down and stay."

- (1) Introduce narrative medicine courses, infuse humanistic values into teaching practice, guide students to elevate their understanding of diseases to respect for life, and make them pay more attention to the quality of life in the modern "biological psychological social" medical model.
- (2) Effectively integrate the courses of general practice medicine with ideological and political education, deeply explore the ideological and political elements contained in the courses, strengthen students' in-depth understanding and recognition of relevant systems such as Healthy China, graded diagnosis and treatment, and family doctors, cultivate students' empathy, and promote students' understanding of the basic general practitioner profession.
- (3) Carry out rich and colorful humanistic quality practice activities to make up for the deficiencies of medical students in humanistic quality, make their knowledge structure more scientific and reasonable, and promote the coordinated development of ideological and moral quality, medical humanistic quality, and physical and mental health quality of targeted medical students.
- (4) Pay attention to strengthening the positive publicity of advanced models and deeds, invite outstanding models rooted in the grassroots to give advanced deeds reports to targeted medical students, guide targeted medical students to firmly uphold their ideals and beliefs, and establish the determination and confidence to root in the grassroots and serve the masses.

### **4.2. Building a high-level clinical practice teaching base, consolidating the professional and technical knowledge of senior students, and cultivating general medical talents who can be used and do well**

#### **4.2.1. Carrying out the "Six Ones" project**

Before the order-oriented medical students enter the internship, they should fully utilize the mentorship system to carry out the "Six Ones" project, that is, to follow the mentor for one outpatient visit, one consultation, one ward round, participate in one small lecture or medical record discussion, write a medical record, and enter the operating room. By learning from the mentor system, students can fully improve their doctor-patient communication skills, clinical knowledge level, and consultation abilities. By conducting teaching rounds on a certain case, students can master the diagnostic and treatment thinking of a symptom or similar case, cultivate



the interest of order-oriented medical students in clinical professional knowledge, enhance their clinical logical thinking ability, and improve their clinical professional skills.

#### **4.2.2. Building an open and shared modern clinical skills training platform**

The teaching system of applied undergraduate clinical training must highlight the cultivation of practical abilities. Our clinical training teaching center currently covers an area of over 3000 square meters and is equipped with training equipment worth more than 20 million yuan. It can carry out nearly 100 training projects and has a standardized OSCE examination station. On this basis, we will further construct a comprehensive, specialized, and integrated clinical practice teaching system that adapts to the future development of medical education. Taking our hospital's talent training goals as the benchmark and cultivating outstanding doctors as the goal, we will strengthen the comprehensive cultivation of students' professional quality, basic knowledge, practical ability, and job competence, and build a modern clinical skills training platform that is open and shared with "first-class equipment, first-class teachers, first-class management, and first-class level." Putting students at the center, further strengthening practical skills training, consolidating the professional skills of senior students, and cultivating "useful and well-performing" general medical talents.

#### **4.3. Building an "Innovation and Entrepreneurship Education Platform for the First Affiliated Hospital of Xi'an Medical University" to attract students to engage in exploratory learning and innovative practice, and cultivate innovative medical talents**

The hospital has developed the "The First Affiliated Hospital of Xi'an Medical University Teaching Development and Evaluation Service Platform" in the early stage, which includes two major sections: "Teacher Development" and "Teaching Evaluation." It has achieved information-based teaching evaluation and teacher management. At present, we have launched the "Innovation and Entrepreneurship Education" section on the Education Development and Evaluation Service Platform, which includes four major sections: the latest information, honor list, excellent cases, and college-level cultivation. This has effectively integrated and shared innovation and entrepreneurship resources, provided specialized training and guidance for students to carry out scientific research and technological development activities, and attracted students to engage in exploratory learning and innovative practice.

#### **4.4. Reforming and improving the endogenous incentive mechanism that meets the requirements of high-quality development, improving the incentive-oriented evaluation mechanism, and mobilizing the enthusiasm, initiative, and creativity of clinical teachers**

Reform and improve an endogenous incentive mechanism that meets the requirements of high-quality development, and tilt the performance reform of public hospitals towards teaching; Incorporate teachers' teaching workload, training outcomes, and teaching evaluation results into the professional title evaluation process; Establish a sound incentive-oriented evaluation mechanism, set up special reward funds for teaching and research, and reward departments and individuals who have outstanding performance in teaching work, using this as a lever to fully mobilize the enthusiasm, initiative, and creativity of clinical teachers.

### **5. Conclusion**

The cultivation of general practitioners in the context of new medicine is related to the reform of medical education and the development of the healthcare industry. At present, the promotion of new medicine and



the cultivation of general practitioners in China are still in the early stages of development, and it will take a long time to explore the improvement of the new medical system and the maturity of the general practitioner training model. Medical colleges should take the cultivation of general medical talents as the main line, plan the development pattern of medical education with new concepts, break down the barriers of interdisciplinary integration with new structures, innovate diverse collaborative talent training carriers with new models, enhance the core competitiveness of medical talents with new quality, lead the development of human civilization and medical education reform with new systems, continuously supply general medical talents that meet the requirements of the new era to local areas, and help build a healthy China.

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## Disclosure statement

The authors declare no conflict of interest.

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# Designing a Health Education Card Game for Adolescents Based on Constructivist Learning Theory: A Case Study of “Night of Hospital”

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**Abstract:** This study explores the design of functional health science games from the perspective of constructivist learning theory, with a particular focus on card-based gameplay. Using antibiotic-resistant bacteria and phage therapy as thematic content, the research proposes three core design principles: interactive exploratory environments, progressively challenging yet controllable level structures, and trial-and-error-based learning. These principles are applied in the prototype game Night of Hospital. The study details the design process across three key dimensions—visual environment, level mechanics, and deck-building systems—and demonstrates how knowledge construction can be embedded within the game system. The findings provide a viable framework for enhancing both the educational impact and entertainment value of science communication games.

**Keywords:** Constructivist learning theory; Health science communication; Card game design

**Online publication:** July 3, 2025

## 1. Introduction

Currently, digital games are increasingly being applied in the field of education to meet more diverse teaching needs. Science communication games (also known as science-based serious games) are a genre of games centered on science communication or education. Positioned between “serious games” and “entertainment games,” they aim to achieve educational outcomes while also emphasizing player engagement and immersion, thereby gaining widespread recognition<sup>[1–3]</sup>.

Compared with traditional methods of health science communication, functional health science games offer three key advantages: stronger communicability, higher user engagement, and the ability to educate through entertainment. In an era where public concern for health is increasing, such games have gained growing attention and promotion across medical institutions, universities, relevant professional sectors, and enterprises.

In theoretical research, Jean Piaget is regarded as a leading figure of cognitive constructivism. He

emphasized that individuals actively construct knowledge within their cognitive structures through direct interaction with the environment<sup>[4-6]</sup>. Shalom Fisch, in his analysis of educational television programs such as Sesame Street and Arthur, proposed a cognitive capacity model that explains how viewers process the relationship between educational and entertainment content when engaging with edutainment media<sup>[7]</sup>.

In terms of design practice, a number of well-regarded health science games have already been developed. Examples include Foldit (2008)<sup>[8]</sup>, where players solve protein-folding puzzles to contribute to scientific research; ImmuneQuest (2013)<sup>[9]</sup>, in which players embody immune cells to fight viruses and learn about the immune system.

However, there are some common problems in health science games today, such as the inability to balance functionality and entertainment, lack of immersion and experience, and insufficient motivation and driving force for players<sup>[10]</sup>. In order to improve these problems, some effective and appropriate design ideas and methods are urgently needed.

As a type of science game, health science games need to avoid being boring and “cramming” education, and enable players to actively and voluntarily participate in the research and exploration of knowledge during the game. Players’ “initiative” is the key to making the dissemination of health science games more effective.

This study combines constructivist learning theory and positions players as active participants in knowledge construction rather than passive information receivers. Based on Piaget’s cognitive development model, interactive exploration and visual feedback are used to support learners’ self-exploration and construction. By integrating health knowledge into an interesting and structured card game model, players can explore, try, adapt, and learn in the context, which embodies the core principles of exploratory learning.

## **2. Design principles for integrating constructivist theory into health science card games**

Jean Piaget’s experiential learning model is a classic cognitive learning model, which believes that learners actively construct knowledge through interaction with the environment, and learning is a gradual and autonomous process based on exploration, operation, and reflection<sup>[4]</sup>. Based on this, this paper proposes three principles for the design of health science games, which are as follows.

### **2.1. Space is interactive and exploratory**

There are interfaces that can be manipulated and explored in the game, giving players more opportunities to discover information through their own will, making the way to obtain this information more active, rather than letting players passively be instilled with relevant knowledge, which is boring, tedious, and difficult to gain cognitive and thinking interest.

Specifically, there should be an interface where players can voluntarily choose whether to read cards, achievements, stories, monster information, skill buffs, and equipment, so that players can check all their information at any time during the game. At the same time, different cards have different functions, and different functions correspond to different visual effects, so that players can explore what effects can be triggered by using different cards and better recognize, classify, and memorize the knowledge information carried by the cards.

### **2.2. The level design principle is to make it both challenging and controllable**

Level design is the key to whether the game can be played, and the difficulty of the level needs to be varied and selectable.

For example, the level can be divided into three modes: easy, normal, and difficult. After completing the easy mode, the next level can be unlocked. For example, if the ability is restricted (such as the monster developing drug resistance and the damage reduced), the gain and currency reduction can stimulate the player's interest in continuing to challenge and try.

At the same time, the level also needs to follow the monster design idea from easy to difficult, so that players can choose their own card type according to the difficulty of the monster, and the game events that are more suitable for improving their own card modules, so that players can pass the level through their own understanding during the game, and have a deeper thinking about the knowledge.

### **2.3. Design principles guided by trial and error**

As one of the most classic battle games, card games have a very rich deck combination and experimental space. Different decks mean different coping strategies. How to get the most powerful deck in the game is a very good experience.

Players constantly look for ways to stably pass monsters by looking for the best solution in different cards. In which a poor combination may lead to the failure of the battle.

However, in a whole game level, after failure, there will be a limited number of times to guide players to re-select a card or trigger a game event, so that players can get an adjustment opportunity to challenge again, and can get cognitive adjustments in the process of trial and error.

## **3. Design practice: Night of Hospital**

This study uses drug-resistant bacteria and bacteriophages as cases and explores how to improve the benefits and effectiveness of health science games based on the design principles proposed in the second part.

### **3.1. Design background**

Antibiotics are drugs used to prevent and treat bacterial infections. In the post-antibiotic era, new resistance mechanisms are emerging and spreading around the world, threatening humanity's ability to treat common infectious diseases.

#### **3.1.1. Phage therapy**

Phage therapy is an alternative to traditional antibiotics that uses bacteriophages (a virus that can infect and destroy specific bacteria) for targeted treatment to fight bacterial infections. First explored in the early 20th century, phage therapy has been revived with the rise of antibiotic-resistant "superbugs." Because it can act on a single bacterium, it has fewer side effects on other bacterial flora in the human body<sup>[11,12]</sup>.

#### **3.1.2. Proportions of antibiotic-resistant strains**

In China, the most prevalent antibiotic-resistant bacteria include *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Acinetobacter baumannii*. Among these, Gram-negative bacteria account for approximately 71.1% of resistant strains, while Gram-positive bacteria represent about 28.9%.

## **3.2. Prototype design of Night of Hospital**

### **3.2.1. Design concept and strategy**

This study presents a prototype that integrates an aesthetically cohesive and information-rich exploratory



environment. The game world is designed to stimulate players' curiosity through interactive elements and investigative storytelling, encouraging voluntary information gathering and engagement. The gameplay mechanics are structured to allow repeated trial-and-error experiences, fostering reflection and adaptive learning.

By enhancing players' sense of agency and accomplishment during the knowledge acquisition process, the game aims to simultaneously fulfill its functional role in disseminating health science knowledge and provide an engaging entertainment experience.

The core design strategies are as follows:

(1) Environment and visual design

The overall visual style adopts a bold, vibrant, and minimalist flat design. Color is used not only to convey emotional information but also to clearly differentiate functional zones, allowing players to intuitively and actively choose which areas they wish to explore. Most environments are designed with clickable elements that lead to detailed views, encouraging user-driven investigation.

When players acquire story fragments, cards, or achievements, they can choose whether to view detailed text descriptions. Similarly, when players obtain buffs or event items during exploration, corresponding icons are displayed on the interface, allowing players to click and view them at any time, reinforcing agency and self-directed interaction.

In terms of character role, the player takes on the role of a scientific investigator exploring a long-abandoned hospital to uncover its hidden secrets. The narrative blends elements of reality with surreal fantasy to enhance the sense of mystery and player engagement.

Five types of bacteria—each associated with a typical color representation—are reimagined as monster-like entities, designed with distinct visual characteristics and embedded within different scenes of the game. This visual metaphor not only adds to the atmosphere but also stimulates players' curiosity to learn more about each pathogen.

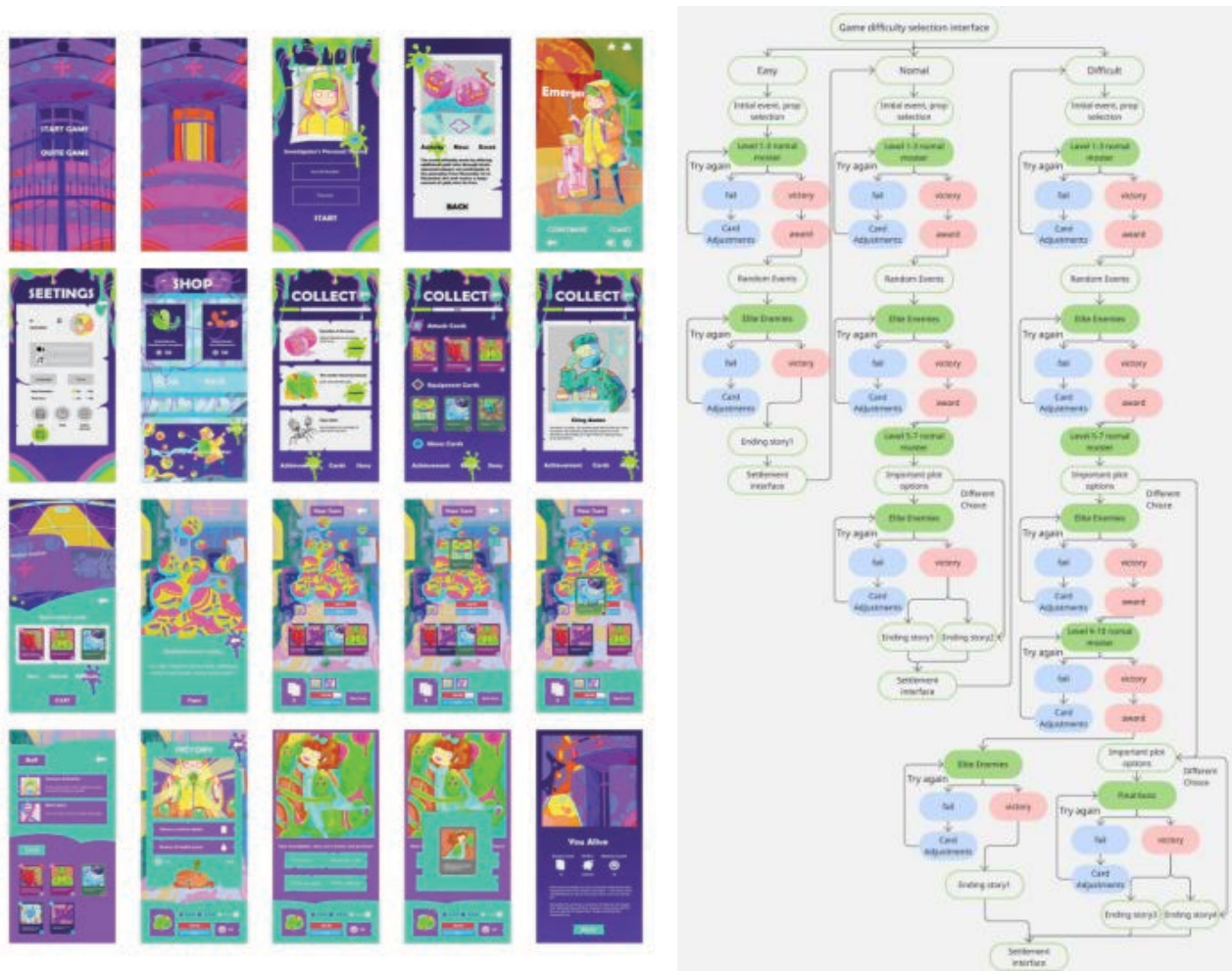
(2) Level design

The level design integrates narrative progression, tiered unlocks, and multiple endings to create a structure that is both challenging and player-driven (see **Figure 1**). Difficulty levels are not imposed but selectable, allowing players to engage at their own pace.

Narrative serves as the core driver of progression: the player, acting as an investigator, begins their journey by entering the abandoned hospital. As the investigation deepens, they uncover fragments of the hidden truth, culminating in a complete storyline that ends with their escape.

Progressive unlocking encourages continued exploration: upon completing the game in easy mode, players unlock the normal mode for the second playthrough, and subsequently gain access to hard mode under the same logic.

Multiple endings encourage diverse decision-making: in the higher difficulty levels, players encounter a wider range of branching events and moral dilemmas. The different choices they make—such as acquiring certain items or responding to specific situations—will directly affect which ending they achieve.



**Figure 1.** Game level and art design

### (3) Deck-building design

As a card-based game, deck-building constitutes the core area where players engage in repeated experimentation. The design is informed by current mainstream approaches to combating antibiotic-resistant bacteria—namely, antibiotic therapy, phage therapy, and the human immune response. These three methods are translated into the game’s primary deck types available to players.

Each deck represents a different knowledge framework and combat strategy. Combinations of different decks produce varied battle effects, which, when effectively integrated, support players in clearing levels successfully. Accordingly, the design links specific treatment approaches and bacterial mechanisms to distinct, coherent card sets.

Players are encouraged to experiment by combining cards across different decks to address various bacterial threats. This trial-and-error process enables players to reflect on and adjust their understanding of antimicrobial strategies and resistance mechanisms while playing, thus reinforcing educational outcomes through gameplay.

### 3.2.2. Game design

The game emphasizes an exploratory and informational design model. To support this, each interface includes clickable buttons that allow players to access detailed information at any time. For example, during battles,

players can freely check card details, active buffs, and equipped items. After completing a level, the game records the deck used for that playthrough, which players can revisit and analyze at any time.

Additionally, the game allows players to pause mid-play and temporarily return to the main menu. From there, they can enter auxiliary information interfaces to further explore story elements, card explanations, or character data. After acquiring additional knowledge or context, players can seamlessly resume gameplay from where they left off (see **Figure 2**).



**Figure 2.** Game operation logic design

## 4. Conclusion and future directions

This study, grounded in constructivist learning theory, conducted an in-depth design investigation into the card game genre within health science games. Based on literature analysis and using antibiotic-resistant bacteria as a thematic case study, the research developed clear and actionable design strategies and pathways. Through specific design components—including visual environment design, level design, and deck-building design—the prototype game *A Fantastic Night at the Hospital* was created. This project demonstrates the feasibility and effectiveness of applying constructivist theory to the design of science communication games.

Future research will further explore the integration of constructivist principles with a broader range of game formats, with the aim of expanding the reach and impact of health science games across diverse audiences.

## Disclosure statement

The author declares no conflict of interest.

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# A Study of the Three English Translations of Shen Congwen's *Border Town* Based on Reiss's Translation Criticism Model

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**Abstract:** To promote the global dissemination of Chinese culture, the translation of Chinese classic literature has garnered widespread attention in the translation field. Literary translation criticism plays an essential role in the development of translation endeavors. This paper will analyze three versions of English translations of Shen Congwen's novella *Border Town* using Reiss's translation criticism model and summarize their performance in terms of formal equivalence and aesthetic effect, linguistic components, and extra-linguistic components.

**Keywords:** Reiss's translation criticism model; Translation criticism; Translation

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## 1. Introduction

With China's growing influence in the international community and the accelerated pace of Chinese culture "going global," the translation of Chinese literature has attracted widespread attention. According to the China International Cultural Trade Development Report (2023), the volume of book copyright exports increased from 5,922 items in 2011 to 11,795 items in 2021. Although China's book copyright trade remained in deficit from 2011 to 2021, the import-export ratio narrowed from 2.48:1 to 1.02:1, reflecting a positive reception in overseas markets and renewed vitality for Chinese-themed books<sup>[1]</sup>. During this period, literary translation has undertaken the important mission of disseminating Chinese history, culture, national image, and values. Literary translation criticism further improves translation quality and promotes the healthy development of literary translation. Therefore, conducting translation criticism of Chinese classic literature holds profound significance.

## 2. Origins of the study

Shen Congwen's novella *Border Town*<sup>[2]</sup> represents the pinnacle of the pastoral tradition in modern Chinese literature, consolidating, developing, and deepening the lyrical mode of rural life. Following Lu Xun's *The True*



*Story of Ah Q*, it reshaped the image of China. The pastoral attributes of *Border Town* and its portrayal of China are intertwined, offering a classic template and sentiment for late-developing nations responding to passive modernization. Further analysis reveals that *Border Town*, as a literary refinement of cultural conservatism since the modern era, contains profound flaws and issues such as the appropriation of foreign cultural resources. This exposes the fictional and strategic nature of the dominant ethnic group's self-imagination and its connection to the exotic imagination in Western literature <sup>[3]</sup>.

To date, *Border Town* has four English translations, produced by translators from China, the UK, and the US, with a publication span of 73 years—a remarkable phenomenon in the history of modern Chinese literature translation. The first translation, *Emerald* (literally *Cuicui*), was jointly translated by American writer and translator Emily Hahn (1905–1997) and modern Chinese poet, writer, publisher, and translator Shao Xunmei (1906–1968, pen name Shing Mo-Lei). It was serialized in *Tien Hsia Monthly*. The second translation, *The Frontier City*, was co-translated by Chinese translator Ching Ti and British writer and translator Robert Payne, published in 1947 by George Allen & Unwin in London and reprinted in 1982 by Columbia University Press. The third translation, *The Border Town*, was translated by Yang Xianyi and Gladys Yang, first published in Chinese Literature and later included in Gladys Yang's 1981 collection *The Border Town and Other Stories*, part of the “Panda Books” series by the Chinese Literature Magazine Press. The fourth translation, also titled *The Border Town*, was translated by American sinologist Jeffrey Kinkley and published in 2009 by HarperCollins. These four translations span 73 years, witnessing the history of modern Chinese literature in English.

Since the publication of the first translation in 1936, domestic research on *Border Town* translations has flourished. Studies fall into two main categories:

(1) Analysis of *Border Town* translations from specific theoretical perspectives, e.g., Liu <sup>[4]</sup> explored Gladys Yang's artistic representation of aesthetic elements in *Border Town* from the perspective of translation aesthetics; Wang and Jiang <sup>[5]</sup> analyzed Jeffrey Kinkley's thick translation strategy using Bourdieu's concept of cultural capital; (2) Comparative studies of different translations, e.g., Wang and Xie examined the influence of translators' native-language pragmatic orientations on translation based on the four translations; Peng and Wan <sup>[6]</sup> compared three translations using corpus methods to reveal stylistic features.

However, few studies focus on comparative analysis of the translations from textual and linguistic perspectives. Given the distinct translator styles and the significant time span, there is room for broader and deeper research to fully leverage the role of literary translation criticism in promoting cultural exchange.

### 3. Case studies

#### 3.1. Formal and aesthetic equivalence

As an expressive text, *Border Town*'s translations are first evaluated for formal and aesthetic equivalence.

Example 1

ST: “是谁人？”

“是翠翠！”

“翠翠又是谁？”

“是碧溪岨撑渡船的孙女。”

“你在这儿做什么？”

“我等我爷爷。我等他来。”

“等他来他可不会来，你爷爷一定到城里军营里喝了酒，醉倒后被人抬回去了！”

“他不会这样子。他答应来找我，他就一定会来的。”

“这里等也不成。到我家里去，到那边点了灯的楼上去，等爷爷来找你好不好？”

“悖时砍脑壳的！”

杨译：“Who are you?”

“Emerald.”

“Who’s Emerald?”

“My grandad’s ferryman at the Green Stream.”

“This is no ferry. What are you doing here?”

“Waiting for grandad. He’s going to take me home.”

“He can’t be coming. Must have gone to the barracks to have a drink, got drunk and been carried home.”

“My grandad’s not like that. He said he’d come, he will.”

“Well, don’t wait here. Come to my house—that one with the lamps—and wait for him there.”

“To hell with this hooligan!”

隄译：“Who are you?”

“I’m Green Jade.”

“And who is Green Jade?”

“The granddaughter of the old ferryman at Blue Stream Hills.”

“Well, what are you doing here?”

“Waiting for my grandfather. I must wait for him.”

“You must wait for him, eh? But where is he? Must have been drinking, and they carried him home.”

“Not true. He said he was coming, and he will!”

“You can’t wait for him here. Go up to my house. Over there where the lamps are lit. Why not wait for your grandfather there?”

“You swine! You ought to be beheaded!”

金译：“Who are you?”

“CuiCui.”

“And who might that be?”

“The granddaughter of the ferryman at Bixiju, Green Creek Hill.”

“What are you doing here?”

“Waiting for my grandpa. He’s coming to get me.”

“It doesn’t look like he’s coming. Your grandfather must have gone into town for a drink at the army barracks. I’ll bet he passed out and someone carried him home!”

“He wouldn’t do any such thing. He said he’d come get me, so that’s what he’ll do.”

“This is no place to wait for him. Come up to my house, over there where the lamps are lit. You can wait for him there. How about that?”

“Damned low-life! You’re headed for the executioner!”

Yang uses short dialogues, retains the original’s rhythm. Translates “悖时砍脑壳” as “To hell with this hooligan!” conveying the rustic tone. Ti similarly concise but translates the phrase as “You swine! You ought to be beheaded!” losing some colloquial nuance. Kinkley renders it as “Damned low-life! You’re headed for the executioner!” capturing the emotional intensity. All three versions achieve formal equivalence, but Yang’s translation excels in aesthetic effect.

## 3.2. Linguistic components

According to Reiss's translation criticism theory, linguistic elements comprise three dimensions: semantic, lexical, and stylistic, each governed by specific evaluative criteria.

### 3.2.1. Semantics

According to Reiss's translation criticism theory, linguistic elements encompass three dimensions: semantics, vocabulary, and style, each governed by specific criteria. At the semantic level, failures to recognize polysemous words and homonyms, inconsistencies between source and target terms, as well as misinterpretations, arbitrary additions, or omissions, constitute the most significant risks for translators. To ensure semantic equivalence, it is imperative to examine these elements within their linguistic context <sup>[6]</sup>.

#### Example 2

ST: “嗨嗨，你这个喽啰！要你到我家喝一杯也不成，还怕酒里有毒，把你这个真命天子毒死！”

杨译：“Hey, there, outlaw! You wouldn't come in and have a drink with me. Afraid I'd poison a big man like you, eh?”

隄译：“Hey, you! You wouldn't come to have a drink in my house, you remember? You were afraid I might poison the wine, eh? And you're such an important old fellow—a future Emperor, most likely?”

金译：“Hey, there, you old highwayman, I asked you to stay for a drink but you wouldn't stay put! Were you afraid of poison? Did you think I dared to slay a true-born Son of Heaven?”

Yang's translation of “Outlaw” and “a big man like you” accurately conveys the playful tone. Ti's translation of “You” and “a future Emperor” misinterprets the latter term. Kinkley's translation of “Highwayman” fits, but “true-born Son of Heaven” is overly literal. Yang's translation best achieves semantic equivalence.

### 3.2.2. Vocabulary

From the lexical perspective, the criterion for assessing vocabulary elements is adequacy, which necessitates determining whether the components of the source text have been fully conveyed at the lexical level in the target language. This involves evaluating the translator's effectiveness in handling specialized terms and unique expressions, such as “false friends,” homonyms, untranslatable words, proper nouns, metaphors, wordplay, idiomatic phrases, and proverbs <sup>[7]</sup>.

#### Example 3

ST: ..... 那翠翠却傍花轿站定，去欣赏每一个人的脸色与花轿上的流苏。

杨译：.....get the first possible glimpse of the bridal sedan-chair.

隄译：..... while Green Jade settled up close to the bridal chair, gazing intently at the chair and the embroidered decorations.

金译：..... while Cuicui stood by the ornately decorated bridal sedan chair, taking note of all the faces in the procession and the tassels on the palanquin.

Yang translated “花轿” to “Bridal sedan-chair,” capturing the function but missing decorative details. While Ti's “Bridal chair” is ambiguous. Kinkley translated it as “Ornately decorated bridal sedan chair” and “palanquin,” fully conveying the richness. Kinkley's version is the most adequate.

### 3.2.3. Style

From a stylistic perspective, it is essential to determine whether the target text demonstrates complete “correspondence,” whether the translation adequately accounts for distinctions between colloquial and standard/

formal usage in the source text, and whether the author's creative expressions deviate from conventional language usage in terms of specific stylistic features <sup>[7]</sup>.

#### Example 4

ST: “白鸡关出老虎咬人，不咬别人，团总的小姐派第一……大姐戴副金簪子，二姐戴副银钏子，只有我三妹没得什么戴，耳朵上长年戴条豆芽菜”。

杨译: The tiger eats the captain's daughter first;

Most girls have gold and silver for their hair;

Poor Emerald is the one who comes off worst—

No trinkets, nothing but bean-sprouts to wear!

隄译: “There comes the Tiger from the White Cock Pass,

And he will only bite the Chieftain's daughter.

My eldest sister has a gold pin in her hair,

My second sister has silver bracelets on her wrists,

But I, the third maiden, have nothing to wear.

But a bean-sprout behind my ears all the year round...”

金译: The tiger at White Rooster Pass feasts on people

And he'll get the militia captain's daughter first.

Sister No. 1 wears a pair of gold hairpins,

Sister No. 2, a pair of silver bracelets,

But Sister No. 3, little me, has no jewelry to be found.

Just bean-sprout earrings, worn all the year round.

This part is a folk rhyme sung by Cuicui. Yang uses rhyme (“first”/ “worst,” “hair”/ “wear”), enhancing the humorous tone. Ti's translation lacks rhyme, weakening the stylistic effect. Kinkley rhymes (“people”/ “first,” “found”/ “round”), retaining the playful style. Yang and Kinkley best replicate the original style.

### 3.3. Extra-linguistic components

According to Reiss's translation criticism model, upon completing the analysis of linguistic elements, the evaluation proceeds to examine the three translated versions of *Border Town* through the lens of extra-linguistic factors. While Reiss's framework encompasses seven dimensions—immediate situation, theme, temporal context, geographical setting, addresser, and addressee, as well as affective connotations—this study focuses specifically on four key aspects most pertinent to *Border Town* and its translations: immediate situation, theme, target readership (receiver), and affective connotations.

#### 3.3.1. Immediate situation

The immediate situation refers to the contextual background of narrative events. While authors may omit certain details for conciseness, relying on source-language readers' cultural knowledge to fill these gaps, target-language readers often lack such contextual understanding. Consequently, to achieve semantic equivalence, translators must adopt an empathetic stance toward the source text, accurately comprehending the contextualized meaning within the specific situational framework <sup>[7]</sup>.

#### Example 5

ST: ..... 我们应当说一是一，不许三心二意。

杨译: A Chatong girl should stick to her word. None of this shilly-shallying!

隄译 : You ought to keep your words and not have “three hearts and two minds.”

金译 : We stick to our promises, we don’t give into second thoughts.

The phrase “说一是一” means stick to one’s word, and “三心二意” means indecisive. Yang translated it to “Stick to her word” and “shilly-shallying” fit the context. Ti’s translation, “three hearts and two minds,” is confusing. Kinkley’s “Second thoughts” alters the emotional tone. Yang’s translation best preserves the context.

### 3.3.2. Theme

#### Example 6

ST: 为了住处两山多篁竹, 翠色逼人而来, 老船夫随便为这可怜的孤雏拾取了一个近身的名字, 叫做“翠翠”。

杨译 : Because their home was among bamboos and hills of a glorious emerald green, the old boatman gave the poor mite the name Emerald.

隄译 : The cottage lay between hills covered thickly with bamboo groves, whose jade-green leaves filled the eyes with interminable bright color, and so he called her “Green Jade.”

金译 ; Because of the compelling deep, emerald green of bamboo stands covering the mountains on either side by the stream where they lived, the old ferryman, without a second thought, named the girl after what was close at hand: Cuicui, or “Jade Green.”

Yang’s translation of “Emerald” loses the rustic charm. Ti’s “Green Jade” is culturally distant. Kinkley’s “Cuicui” retains the phonetic and cultural essence. Kinkley’s version aligns best with the pastoral theme.

### 3.3.3. Receiver

The concept of the receiver refers to the target-text reader’s capacity to comprehend and engage with the translated material, serving as a crucial quality assessment parameter. When handling culture-specific elements in the source text, translators must ensure the target audience can effectively interpret the text within their own cultural framework. Particularly for culture-bound imagery, critics must examine whether translators have successfully transposed the mental representations shared by source-language readers into the conceptual world of target-language readers<sup>[7]</sup>.

#### Example 7

ST: “老伯伯, 你翠翠长得真标致, 像个观音样子。”

杨译 : “Uncle, your Emerald’s grown into a fine girl, a regular Guan Yin. \* [Notes]\*: The Goddess of Mercy.

隄译 : “Old uncle, you know---Green Jade is very attractive.”

金译 : “Elder Uncle, your Cuicui has grown quite beautiful. She’s a real Guan Yin. \* [Notes]\*:

“观音” was the goddess of mercy, a beauty in Buddhist iconography, also known as Bodhisattva Guanshiyin, a name of a Buddhist Bodhisattva. It is the transliteration of the Sanskrit word Avalokiteśvara, and later evolved into an image of compassion and kindness. Yang adds a footnote for cultural explanation. Ti simplifies to “attractive,” losing cultural depth. Kinkley provides detailed notes, enhancing understanding. Kinkley’s approach is most reader-friendly.

### 3.3.4. Affective connotations

Affective connotations primarily influence lexical and stylistic decisions in translation, as every text carries distinct emotional values that are typically manifested through various rhetorical devices including humor,



irony, derision, sarcasm, exhilaration, emphasis, and other expressive modalities. Translation critics must systematically evaluate whether these nuanced affective elements have been adequately preserved and effectively reconstituted in the target text.

#### Example 8

ST: “爷爷，你疯了！再说我就生你的气！” “谁也不稀罕那只鸭子！”

杨译：“Are you out of your mind, granddad? Don’t talk such nonsense!” “Who wants their duck?”

隄译：“You’re stupid, grandfather. I do think you are stupid! I’ll be as angry as anything if you ever say another word!” “Who cares for the drakes?”

金译：“Grandfather, you’re crazy! Keep on like this and I’ll get angry!” “Who wants that old duck?”

This sentence implies Cuicui’s playful anger. Yang’s translation of “Out of your mind” is too strong. Ti’s translation “Stupid” captures the tone well. Kinkley’s translation “Crazy” fits the context. Ti and Kinkley convey the emotion more accurately.

## 4. Conclusion

Based on the aforementioned analysis, the comparative assessment of the three translations across formal equivalence, aesthetic equivalence, linguistic elements, and extra-linguistic factors yields the following conclusions: First of all, all three translations substantially achieve formal equivalence with minimal variance. Yang-Gladys’ version demonstrates superior bicultural competence, achieving the highest aesthetic resonance; Kinkley’s translation exhibits deeper sinological insights into Shen Congwen’s oeuvre, ranking second aesthetically; Ti-Payne’s version shows relatively weaker aesthetic performance. Secondly, Yang-Gladys and Kinkley versions excel in semantic, lexical, and stylistic dimensions; Ti-Payne translation trails in linguistic precision. Thirdly, Kinkley’s version demonstrates optimal cultural transposition, while Yang-Gladys and Ti-Payne versions follow respectively.

This comprehensive assessment demonstrates how Reiss’s theoretically robust yet flexible framework enables nuanced evaluation of multiple translation versions while acknowledging the model’s evolving nature in contemporary translation studies.

## Disclosure statement

The author declares no conflict of interest.

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# Empirical Study on Generative Artificial Intelligence Enabling Chinese Writing Teaching

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**Abstract:** The digital transformation of international Chinese language education is an important direction for enhancing the global dissemination effectiveness of the Chinese language. In teaching Chinese as a second language, writing, as a form of higher-order language output, has long faced challenges such as insufficient teacher resources, lagging feedback, and a lack of personalized support. Generative artificial intelligence (GAI) offers a new path for teaching Chinese writing. This study, with intermediate Chinese learners as the subjects, systematically explores the effectiveness of GAI-assisted Chinese writing instruction through a combination of controlled experiments and interviews based on a Chinese learning platform embedded with GAI. The study found that the GAI class was significantly superior to the traditional class in terms of the adequacy dimension of content quality and the grammatical and lexical dimensions of language quality; teachers and GAI play complementary roles in this process; most Chinese learners have a positive attitude towards this model. Based on the above findings, this study presents three suggestions: using GAI to empower Chinese writing instruction, giving full play to the complementary advantages of human and machine, and enhancing the AI literacy of teachers and students to achieve two-way empowerment of human and machine, with the aim of promoting the intelligent development of international Chinese education.

**Keywords:** Generative artificial intelligence; Chinese writing instruction; Quality of writing

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## 1. Introduction

Digital development is a key direction for the advancement of international Chinese language education, as well as an important platform for multi-party participation and collaborative success<sup>[1]</sup>. Chinese writing instruction starts with discourse organization and paragraph expression, with the goal of improving discourse expression ability. It covers basic training in various aspects such as Chinese character writing, word formation, sentence construction, and discourse cohesion, and is a more complex form of language output. However, the traditional Chinese writing instruction model is limited by teacher resources, feedback lag, and method singleness, making it difficult to meet the individualized needs of learners. In recent years, the emergence of generative artificial intelligence (GAI), represented by ChatGPT, has brought great possibilities for educational transformation. Lu pointed out that to

ensure Chinese reaches the world faster and better, efforts should be made to enable more people in various countries to learn and use the written Chinese well, and called for exploring the digital path of written language teaching. After a series of exploratory trials in the field of international Chinese language education, it has been found that this intelligent means can contribute well to the transformation of learning models, the construction of learning resources, and the scientification of teaching assessment. Despite the broad application prospects of GAI, existing research has mostly focused on the English context, and empirical exploration of Chinese writing is still in its infancy <sup>[2]</sup>. This study takes intermediate Chinese learners as the research subjects, conducts teaching experiments based on a Chinese learning platform embedded with generative artificial intelligence, explores the effectiveness of GAI in empowering Chinese writing instruction, and puts forward relevant suggestions for promoting the intelligent development of international Chinese language education.

## **2. Literature review**

### **2.1. Current status and limitations of research on Chinese writing instruction**

Chinese writing instruction focuses on the development of discourse ability and builds a multi-level language output system through systematic training from Chinese character writing, vocabulary application, sentence structure, to discourse cohesion <sup>[3]</sup>. The existing teaching models have diversified characteristics, including traditional paradigms such as the “result-oriented” focus on the finished product, and the “process-oriented” focus on writing behavior, as well as the “learning and application” model of English as a second language instruction <sup>[4]</sup>. At the practical level, eight teaching methods have been formed, including the control method, the genre method, and the task method, among which the process method and the task method have attracted much attention from the academic community. It is notable that the academic community is exploring teaching breakthroughs through integrated innovation, such as the “process genre method” <sup>[5]</sup> and the “read-write integration” teaching method <sup>[6]</sup>. Wen Qiufang’s “outcome-oriented approach” was later applied to the practice of writing Chinese as a second language. However, the actual effectiveness of written language teaching has long been out of balance with the status of the discipline, and only 12 percent of students can achieve the goal of expressing thinking in Chinese <sup>[7]</sup>. The predicament stems from three constraints: the multi-dimensional bias caused by the particularity of the Chinese character system and the comprehensiveness of writing, the difficulty and applicability limitations of teaching methods, and the practical predicament of dynamic monitoring of the writing process. These systemic challenges urgently need to be addressed through teaching innovation in order to enhance the effectiveness of cultivating written expression ability in Chinese.

### **2.2. Opportunities and challenges for GAI to assist Chinese writing teaching**

Generative artificial intelligence (GAI), as an emerging intelligent technology, provides an innovative path to break through the traditional predicament of Chinese writing teaching with its multimodal intelligent processing capabilities. This technology can be applied throughout the entire writing process. In the conception stage, it can expand understandable input through intelligent retrieval and demonstrate language transfer strategies with functions such as multilingual translation and grammar correction <sup>[8]</sup>. The formative assessment stage enables automated grading and personalized feedback. Empirical research shows that ChatGPT’s immediate feedback in the field of English writing has both efficiency and quality advantages over traditional teacher feedback <sup>[9]</sup>, and assisted modification significantly improves micro-language elements such as vocabulary and grammar <sup>[10]</sup>. However, GAI still faces technical bottlenecks and ethical dilemmas. Functionally, GAI has problems such as sometimes inaccurate semantic understanding, the lack of classification of vocabulary and grammar levels,

the need for enrichment of high-quality basic Chinese corpora, and the generation of inaccurate or fabricated information <sup>[11]</sup>. In terms of ethical risks, learners may fall into a crisis of mental inertia, leading to weakened writing innovation and academic integrity issues <sup>[12]</sup>. These dual effects suggest that AI tools need to form educational synergy with teacher-led instructional design rather than a simple substitution relationship.

To sum up, existing research has initially revealed the potential of GAI in assisting second language writing instruction, particularly in providing immediate feedback, enhancing language input, and stimulating learning motivation. However, there are still three deficiencies in the related research. First, the existing empirical research is mostly focused on the field of English writing, and the application research of GAI for Chinese writing teaching is still in the exploratory stage, especially lacking systematic controlled experiments to verify its effectiveness. Second, the research perspective is rather limited. Most studies mainly rely on the comparison of pre- and post-assessment scores to present the results, and few scholars have delved into specific writing evaluation indicators such as organizational structure, grammar, and vocabulary, making it difficult to fully reveal the micro impact of GAI on the development of second language writing. Third, the role of GAI in teaching is not clear, such as the lack of theoretical exploration of its role as an auxiliary tool, co-subject, or feedback mediator. In view of this, this study intends to explore the impact of GAI support on learners' Chinese writing ability by conducting a controlled teaching experiment and combining interview and writing scoring data, and on this basis, explore the role of GAI in assisting Chinese writing teaching, with a focus on answering the following questions:

- (1) Can GAI-assisted writing instruction improve the quality of learners' writing?
- (2) What roles do GAI and teachers play in the process of writing instruction?
- (3) How do Chinese learners view GAI-assisted Chinese writing instruction?

### 3. Research design

#### 3.1. Research subjects

This study employed an educational quasi-experimental method. The subjects were students from the intermediate Chinese Comprehensive course at a domestic university: 29 students from the GAI class and 29 students from the traditional class (as shown in **Table 1**). These students participated in the unified class placement examination, including listening, speaking, reading, and writing tests. Their Chinese proficiency was basically at HSK level 4, and their abilities were comparable. Their study duration was concentrated between 1 and 4 years. The GAI class had 21 students from developed countries, while the traditional class had 20 students from developed countries, a roughly equal ratio.

**Table 1.** Basic information of participants

Basic information	Options	GAI class ( <i>n</i> = 29)		Traditional class ( <i>n</i> = 29)	
		Number	Proportion (%)	Number	Proportion (%)
Gender	Male	9	31.03	1	3.45
	Female	20	68.97	28	96.55
Chinese language study duration	1 year or less	4	13.79	4	13.79
	1 to 4 years	21	72.41	23	79.31
	More than 4 years	4	13.79	2	6.90



Table 1 (Continued)

Basic information	Options	GAI class (n = 29)		Traditional class (n = 29)	
		Number	Proportion (%)	Number	Proportion (%)
Country	Developed countries	21	72.41	20	68.97
	Developing countries	8	27.59	9	31.03
	Level 4	21	72.41	25	86.21
HSK levels	Level 5	3	10.34	1	3.45
	Not taking the exam	5	17.24	3	10.34

3.2. Experiment process

This study conducted a two-month Chinese teaching experiment based on an online learning platform built by the research team, which enabled teachers to customize teaching processes, upload teaching resources, and set up teaching interventions (as shown in **Figure 1**). Students in both the GAI class and the traditional class went through three stages: pre-experiment preparation, Chinese-themed teaching activities, and post-experiment interviews. Before the experiment began, the teacher introduced the course content and the operation instructions of the learning platform to the students to ensure that each student was proficient in using it.



Figure 1. Experimental platform function module

In the second phase, the teacher organized a total of five language knowledge and cultural inquiry learning activities, with themes including high-speed rail travel, online shopping, self-service pick-up, mobile payment, and low-carbon living. Each learning topic was composed of sections such as an introduction to learning objectives, prior knowledge pretest, learning of new words and grammar knowledge, cultural content experience and interactive communication, opinion summary and expression, learning effect assessment and feedback, self-reflection and improvement, among which the students' output in the "Opinion summary and expression" section was used as their writing text, and the researchers scored and analyzed it. After the experiment, the researcher conducted in-depth interviews with the students to gain a more detailed understanding of their experience and evaluation of the use of human-machine collaborative teaching.

The difference between the two groups was that the GAI class platform was embedded with the Zhipu Qingyan large model, and the role and function of the large model were pre-trained to limit the number of

words, language level, content topic, etc., so that it could act as a Chinese learning and communication partner and writing intelligent mentor to have real-time conversations with learners. The traditional class, however, does not have the support of this model.

### 3.3. Research tools

#### 3.3.1. Language quality and content quality scoring sheets

The assessment of writing quality is divided into two sections: language quality and content quality. The scoring criteria for language quality are based on the composition scoring criteria of the New Chinese Proficiency Test, combined with the writing quality evaluation indicators developed by Wu *et al.* and Cheng <sup>[13,14]</sup>, mainly including three sub-dimensions: grammar, vocabulary, and Chinese characters. The scoring criteria for content quality draw on the second language writing function sufficiency scale by Kuiken and Vedder <sup>[15]</sup>, which specifically includes four sub-dimensions: sufficiency of viewpoints, task requirements, coherence and cohesion, and comprehensibility. The above scale is divided into five grades, with a full score of 5 and a minimum score of 1.

To make the essay scoring fairer, our scoring is divided into two steps: one round of trial evaluation and one round of formal scoring. In the first round, the two raters will conduct a trial evaluation of 58 written texts, which account for about 20% of the total, based on the scoring criteria. After the scoring is completed, the Pearson correlation coefficient of the two raters' scores will be calculated; When the coefficient is below 0.85, the two raters discuss the scores of the essays with greater differences and re-score them until the correlation coefficient reaches 0.85 or above. In the second round, two raters complete the scoring of the remaining written texts. The final score for each essay is the average of the scores given by the two examiners. The quality of each learner's writing was rated by averaging the scores of the five active essays.

#### 3.3.2. Outline of the semi-structured interview

Referring to Liu *et al.*'s <sup>[16]</sup> questions on the students' experiences and feelings regarding intelligent composition feedback, and interview questions on human-computer collaborative instructional design for graduate students, an interview outline on the effectiveness of GAI-assisted Chinese writing teaching was developed. The specific questions include: (1) What roles did GAI play in the stages of conception, formal writing, and revision and reflection? (2) What do you think are the advantages of the teacher and GAI in Chinese writing instruction? (3) What roles do you think GAI and the teacher play respectively in the writing process? (4) What difficulties did you encounter in the process of using GAI? Are there any aspects of GAI that you are not satisfied with? In what aspects do you expect future AI-assisted Chinese writing tools to improve further? (5) Would you like to continue using GAI in your Chinese writing process? Explain the question in more detail during the interview and ask questions at the right time to gain rich, deep, and detailed insights and understanding of the question from the natural context.

## 4. Results

### 4.1. Comparison of the differences in Chinese writing ability and emotion among learners

The study conducted an independent sample *t*-test using SPSS software to statistically test the learning outcomes of the two primary dimensions of content quality and language quality and their corresponding secondary indicators of the students in the two classes. The results are shown in **Table 2**. In the content quality dimension, the GAI class was significantly better than the traditional class in terms of viewpoints

sufficiency ( $t = -2.393$ ,  $P = 0.020$ ), but no significant difference was achieved in terms of task requirements, coherence and cohesion, and comprehensibility. In the language quality dimension, the GAI class significantly outperformed the traditional class in grammar ( $t = -3.057$ ,  $P = 0.003$ ) and vocabulary ( $t = -3.612$ ,  $P < 0.001$ ), while there was no significant difference in Chinese characters between the two groups.

**Table 2.** Results of the independent sample  $t$ -test for learning outcomes between the GAI class and the traditional class (SD: standard deviation)

First-level dimension	Second-level dimension	GAI class		Traditional class		$t$	$P$
		Mean	SD	Mean	SD		
Content quality	Sufficiency of viewpoints	2.88	0.99	2.31	0.78	5.728	0.020
	Task requirements	4.18	0.72	3.73	0.98	3.930	0.052
	Coherence and cohesion	3.67	0.85	3.34	1.03	1.799	0.185
	Comprehensibility	4.17	0.41	4.26	0.37	0.630	0.431
Language quality	Grammar	3.57	0.52	3.11	0.62	9.346	0.003
	Vocabulary	3.63	0.50	3.13	0.56	13.050	<0.001
	Chinese characters	4.79	0.27	4.84	0.19	0.696	0.408

## 4.2. Learners' views and evaluations of GAI-assisted Chinese writing instruction

Based on semi-structured interview data, this study uses category coding and content analysis (as shown in **Table 3**) to explore the role division between teachers and students and GAI in human-computer collaborative writing instruction and students' evaluation of GAI-assisted design.

In terms of role division, learners consider the teacher to play the following roles: teaching leader and common resource provider, responsible for topic selection, section design, and guidance on questioning methods; Teaching organizer, adjusting the pace of teaching based on system feedback and student status; Professional instructors, relying on their teaching experience and humanistic care, provide personalized text feedback. In contrast, the role of GAI is to provide personalized resource providers with material for writing through machine learning and online resources; Companion communicators simulate real conversation environments to regulate expression habits; Language error correctors identify grammatical, lexical, and Chinese character errors to improve the accuracy of expression. In summary, teachers and GAI complement each other in Chinese writing instruction by playing to their strengths.

The interview text shows that the majority of Chinese learners hold a positive attitude towards GAI-assisted Chinese writing teaching and believe that it has many advantages, including resource expansion, supplementation of cultural background and examples; Contextualized training to enhance language application skills through immersive conversations; Interest stimulation to boost confidence and motivation in writing; Immediate feedback to assist in text revision and standardizing expression; Learning situation monitoring, precisely identifying weak points to adjust learning strategies; Multi-dimensional cultivation, integrating language habits, cultural cognition, and thinking innovation to promote the achievement of higher goals.

However, feedback was also received from students during the interviews that the more functions of the platform led to an increase in initial cognitive load; GAI's feedback focused on error identification, lacked in-depth analysis of vocabulary usage, and students still relied on teacher guidance; Expect to improve GAI's questioning skills and humanistic care.

**Table 3.** Interview text data categories, primary coding, and typical categories

Study questions	Categories	Elementary coding	Typical entries (examples)
What roles did the teacher and GAI play respectively in the writing process?	The role of teacher	Instructional design leader, common resource provider, instructional activity organizer, key opinion provider	The teacher combined cultural knowledge to teach us how to optimize expressions with GAI.
	The role of GAI	Personality resource provider, companion communicator, language error corrector	Robots accompany me to practice conversations and correct grammatical errors.
How do learners view GAI-assisted Chinese writing instruction?	Advantages	Enrich teaching resources, simulate real contexts, enhance writing confidence, provide real-time feedback for revision, support self-positioning, and cultivate advanced abilities	GAI recommends a lot of examples, and there are more materials for writing compositions.
	Shortcomings	Increased cognitive burden, insufficient humanization, inaccurate understanding of the question, broad and nonspecific answers	Robots respond too broadly and sometimes fail to understand complex questions.
	Expectations	Learn GAI questioning skills and enhance agent humanistic care	Hopefully the AI can imitate the teacher's tone and increase encouraging feedback.

## 5. Discussion

### 5.1. GAI can effectively improve the quality of students' writing content and language

In terms of content quality, GAI classes performed significantly better than traditional classes in the dimension of viewpoint sufficiency, indicating that generative AI can enrich students' comprehensible input and further supports scholars' functional positioning of GAI as providing input corpora and online translation and question-and-answer. However, the effects of GAI's support on other aspects of writing content quality have not yet emerged, possibly due to the limited duration of the experiment and other factors such as individual AI literacy and learning style. In terms of language quality, GAI classes have significant advantages in grammar and vocabulary, consistent with the findings of Boudouaia *et al.* <sup>[10]</sup> and Tsai *et al.* <sup>[17]</sup>. The interview texts of the learners showed that the intelligent chatbot was able to help students correct grammatical errors and expand vocabulary through diverse resource inputs and real-time interactive feedback. However, there was no significant difference in Chinese characters between the two groups, and it is speculated that both groups maintained high accuracy because the online input method reduced writing errors.

### 5.2. Teachers and GAI play complementary roles in writing instruction

In the human-machine collaborative writing instruction designed in this study, the teacher played the roles of instructional design leader, instructional activity organizer, key opinion provider, and common resource provider. Students were guided to use GAI reasonably and accumulate cultural knowledge through task chain construction, schedule adjustment, and emotional interaction. GAI, for personality resource providers, language error correctors, and companion communicators, uses natural language processing and machine learning techniques to dynamically generate cross-cultural case libraries, analyze learning data in real time, and precisely diagnose language errors. The learner said in the interview that the intelligent robot can provide more abundant resource materials according to their needs than teachers, and can provide real-time feedback and modification



of their writing. Teachers, on the other hand, have the advantage of emotional communication and humanistic care, and their rich teaching experience makes their feedback suggestions more feasible. This functional positioning is in line with the findings of Cai <sup>[18]</sup> and Gu <sup>[19]</sup>. This study confirms that teachers and GAI complement each other, forming a synergistic ecological pattern that significantly improves the effectiveness of writing teaching.

### **5.3. The majority of Chinese learners have a positive attitude towards GAI-assisted Chinese writing**

Learners generally use GAI to complete core tasks such as language resource acquisition, real-time error correction, and writing process support, which are divided into three stages: the conception stage, building a framework through dialogue and expanding thinking with the help of the question guidance mechanism; in the output stage, materials are obtained by using multilingual translation functions and cross-cultural case libraries, vocabulary and grammar examples are sought by relying on the standard language expression of the agent, and language expression is optimized; the revision phase relies on error diagnosis to improve accuracy. Learners' functional descriptions of GAI further support the results of the data analysis, which are consistent with the findings of Xu and Zhao <sup>[20]</sup>. Meanwhile, the model significantly boosts writing confidence, reduces language anxiety, and stimulates students' willingness to continue using it. It further supports the findings of Boudouaia *et al.* However, some learners also pointed out that the current system has three limitations: a heavy initial cognitive load due to its complex functions, an insufficient in-depth analysis of GAI feedback vocabulary, and the need to improve the ability to guide questions and human interaction design.

## **6. Conclusion**

This study, through empirical analysis and theoretical exploration, reveals the multi-dimensional value of generative artificial intelligence (GAI) in empowering Chinese writing teaching. Based on this, the following three inspirations are drawn. Firstly, GAI technology can construct student portraits through multi-dimensional data modeling, supporting teachers in precisely formulating hierarchical goals and matching resources. Combined with the "practice-feedback-correction" closed-loop mechanism to achieve dynamic monitoring and personalized error correction, ultimately forming a "teaching-learning-evaluation integration" framework to promote the coordinated development of language ability and cultural literacy. Secondly, taking advantage of the complementary strengths of humans and machines, based on the "teacher-machine-student" ternary structure, teachers need to focus on the cultivation of higher-level abilities and promote the transformation of the teaching paradigm towards "holistic development" through emotional support and in-depth cultural interpretation; GAI, relying on multimodal data analysis and language generation technology, provides real-time feedback and resource support, and the two form a symbiosis of "value guidance-technology support." Finally, the key to the transformation of the human-machine collaborative education paradigm lies in the mutual empowerment of AI literacy between teachers and students. Teachers need to develop a composite ability of "intelligent diagnosis-human intervention," taking into account technology adaptation and cultural sensitivity. Students need to enhance their digital competence and regulate human-computer interaction behavior. Ultimately, through technological tools, we elevate from "auxiliary means" to "relationship reconstructors" to achieve a new form of education in human-machine intelligence symbiosis.

To sum up, this study, with intermediate Chinese learners as the subjects, systematically explores the effectiveness of GAI-assisted Chinese writing teaching through a combination of controlled experiments and



interviews. The results showed that the GAI class was significantly superior to the traditional class in terms of the dimension of the sufficiency of viewpoints in content quality and the dimension of grammar and vocabulary in language quality. In the interviews, learners indicated that in GAI-assisted Chinese writing instruction, teachers and GAI played complementary strengths and held a positive attitude towards the model, but also pointed out problems such as insufficient depth of feedback and initial cognitive load. Based on this, this study further proposes an optimized path for human-machine collaborative Chinese writing teaching at the theoretical level, with the aim of providing a more practical reference for the digital transformation of international Chinese language education.

## Disclosure statement

The author declares no conflict of interest.

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# Exploration of Teaching Models of College English Reading in the Internet + AI Era

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**Abstract:** In the wave of the “Internet + AI” era, information technology is comprehensively reshaping the landscape of college English reading education. Traditional teaching models struggle to meet the demands of talent cultivation in the new era. The integration of “Internet + AI” technologies brings revolutionary opportunities to reading instruction, significantly enriching teaching resources, enabling personalized teaching, enhancing interactivity, and optimizing evaluation systems. Guided by principles such as student-centeredness and integrated innovation, this study proposes multiple strategies for advancing teaching practices. Using the *Understanding Contemporary China: English Reading and Writing Tutorial* (Foreign Language Teaching and Research Press) as a case study, this paper explores practical pathways for reforming college English reading instruction, aiming to improve teaching quality and students’ comprehensive English reading literacy.

**Keywords:** Internet + AI; College English; Reading teaching models; Understanding contemporary China

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## 1. Introduction

In the context of globalization and rapid technological advancement, English, as a core tool for international communication, has grown increasingly vital. College English reading instruction plays a pivotal role in developing students’ language proficiency and broadening their intellectual horizons. However, traditional teaching models face limitations in methodology, resource utilization, and evaluation frameworks, failing to address diverse learning needs or societal expectations for high-quality English professionals. The deep integration of “Internet + AI” technologies presents both opportunities and challenges for reforming college English reading instruction. Leveraging the high-quality content of *Understanding Contemporary China: English Reading and Writing Tutorial*, this study investigates innovative teaching models, offering practical insights to drive pedagogical reform and elevate educational outcomes.

## **2. Significance of applying “Internet + AI” in college English reading instruction**

### **2.1. Enriching teaching resources and expanding reading horizons**

The internet aggregates vast information resources, including news, literature, academic papers, and multimedia content. Through “Internet + AI” technologies, educators can efficiently curate materials tailored to instructional needs. Intelligent algorithms analyze students’ interests and language proficiency, enabling precise delivery of content such as foreign commentaries, excerpts from classic English works, and academic abstracts. By transcending traditional textbooks and incorporating real-world contexts—such as film clips or international news reports—AI fosters immersive language learning, enhances practical application skills, and cultivates cross-cultural understanding <sup>[1]</sup>.

### **2.2. Enabling personalized teaching to meet diverse needs**

AI technologies collect multidimensional learning data (e.g., reading speed, comprehension accuracy, and quiz performance) to diagnose individual learning styles, knowledge gaps, and competency levels. Based on precise analytics, teachers can design customized learning plans, adjusting reading material difficulty, thematic focus, and learning pathways to align with students’ unique needs. This personalized approach addresses varying skill levels, targets knowledge deficiencies, and unlocks students’ potential, ensuring optimal growth in reading proficiency <sup>[2]</sup>.

### **2.3. Enhancing interactivity and learning engagement**

Internet platforms and AI tools—such as online discussion forums and intelligent learning apps—break the spatial-temporal constraints of traditional classrooms. Students engage in virtual discussions, share perspectives, and resolve queries in real time, facilitated by AI-driven instant feedback. This interactive model boosts classroom participation, fosters collaborative and self-directed learning, and shifts pedagogical dynamics from passive reception to active knowledge construction <sup>[3]</sup>.

### **2.4. Optimizing evaluation systems with data-driven feedback**

Traditional evaluation methods, reliant on standardized exams, are often reductive and delayed. “Internet + AI” enables dynamic assessment systems that track real-time metrics (e.g., reading duration, interaction frequency, and problem-solving patterns). By analyzing reading strategies and knowledge internalization, AI generates precise diagnostics of strengths and weaknesses. Teachers refine instructional strategies accordingly, while students adjust learning methods, forming a closed-loop “teaching-learning-evaluation” framework that elevates educational quality <sup>[4]</sup>.

## **3. Principles for college English reading instruction in the “Internet + AI” era**

### **3.1. Student-centered principle**

Recognizing diverse student capabilities, interests, and knowledge bases, AI technologies analyze platform data (e.g., reading time and interaction patterns) to identify learning preferences and gaps. Customized learning plans—tailored to thematic interests and skill levels—stimulate self-directed learning and lifelong learning habits.

### **3.2. Integrated innovation principle**

Blending online and offline methods, project-based learning, and multimedia tools (e.g., AI-generated materials

and virtual scenarios), this principle fosters engaging, layered instruction that enhances reading outcomes.

### **3.3. Moderation and purposefulness**

Technology should serve as an auxiliary tool, complementing—not overshadowing—instructional goals. Educators must guide students to use AI judiciously, avoiding over-reliance that stifles critical thinking.

### **3.4. Security and ethical considerations**

Robust data protection measures and information ethics education are imperative. Institutions must safeguard student privacy, cultivate digital literacy, and nurture critical discernment to counter misinformation.

## **4. Implementation strategies for college English reading instruction**

### **4.1. Integrating technologies to build multidimensional resource libraries**

AI-powered semantic analysis and intelligent filtering curate globally sourced materials (e.g., bilingual columns, academic databases), categorized by difficulty and theme. For instance, in teaching “Chinese Modernization,” AI aggregates case studies on regional development and multimedia resources, enabling students to explore contemporary China’s advancements in authentic linguistic contexts <sup>[5]</sup>.

### **4.2. Leveraging AI analytics for personalized instruction**

Platforms like Learning Pass and ClassIn analyze behavioral data to generate dynamic learner profiles. In teaching “International Communication of Chinese Culture,” AI identifies weaknesses in terminology translation and cross-cultural expression, offering tailored resources (e.g., case libraries on intangible cultural heritage) and adaptive learning paths.

### **4.3. Fostering interaction and collaboration via digital platforms**

Tools like DingTalk and Miro facilitate cross-temporal collaboration. In a project on “China’s 5G Innovations,” students co-create visual analyses using multilingual sources, refine reports via AI translation tools, and present findings on Tencent Meeting, fostering critical thinking and teamwork.

### **4.4. Optimizing pedagogy and evaluation with intelligent tools**

Grammarly and Turnitin enhance writing quality and provide multidimensional feedback. In teaching “Digital China,” AI evaluates reading strategies, logical coherence, and academic rigor, enabling holistic, data-informed assessments.

### **4.5. Cultivating digital literacy and self-directed learning**

Guided projects (e.g., “Data-Driven Stories of Rural Revitalization”) train students in sourcing data via Google Scholar, visualizing trends with Tableau, and refining academic writing with QuillBot, equipping them with skills for autonomous inquiry.

## **5. Conclusion**

The “Internet + AI” era offers transformative pathways for college English reading instruction. By expanding resources, enabling personalization, and fostering interactivity, these technologies elevate educational quality



and student competencies. While challenges like system stability and digital literacy persist, collaborative efforts among stakeholders can unlock the full potential of technological integration, nurturing globally minded talents equipped for cross-cultural communication.

## Disclosure statement

The author declares no conflict of interest.

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# Plato's Philosophy of Natural Education and Its Contemporary Value: A Textual Analysis Based on *The Republic* in Pursuit of "Natural Justice"

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**Abstract:** Plato's philosophy of natural education revolves around his conception of "natural right." The primary goal of natural education is to guide learners to consciously reflect on the "Form of the Good," thereby fostering the natural reorientation of the soul and its inner harmony through the influence of Eros and the process of recollection. This transformative process facilitates the spontaneous emergence of a socially stratified order rooted in natural right. Embedded primarily in *The Republic*, Plato's philosophy of natural education emphasizes child-rearing practices as foundational to cultivating virtuous citizens. This study examines *The Republic* as its central text, analyzing the theoretical underpinnings, practical principles, and ultimate aims of Plato's natural education philosophy. Additionally, it explores the contemporary relevance of this philosophy for modern educational theory and practice.

**Keywords:** Plato; *The Republic*; Natural justice; Philosophy of education

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## 1. Natural right: The foundational core of Plato's philosophy of education

In the ancient Greek context, "*physis*" (φύσις) stands in radical opposition to "*nomos*" (νόμος), with the distinction between "*physis*" and "*nomos*" constituting a "fundamental antithesis" <sup>[1]</sup>. Following Strauss's hermeneutic, "natural right" is grounded in the universality of an immutable human nature, whereas "conventional right" derives from the plurality of human enactments. As Strauss explicitly states: "Natural right is a right that is discernible by the unassisted human mind, accessible to man as man, and therefore universal. It is the standard for the critical evaluation of positive law and political institutions." <sup>[1]</sup>. In this framework, "natural right" refers to "the order inherent in the nature of man as a rational and political being" <sup>[1]</sup>, transcending temporal and cultural contingencies. Conversely, "conventional right" pertains to "the rules established by human agreement, which vary according to time, place, and regime" <sup>[1]</sup>.

In *The Republic*, Plato stages Socrates' dialectical encounters with *Cephalus*, *Polemarchus*, and *Thrasymachus*, dramatizing the fundamental tension between "natural right" and "conventional right." The

dialogue begins with *Cephalus* invoking the authority of *Pindar*'s idea and *Simonides*'s theory to define "justice" as "speaking the truth and repaying what one has borrowed"<sup>[2]</sup>. For *Cephalus*, a just man is one who adheres to socially sanctioned contracts, while injustice manifests as "failure to fulfill obligations"<sup>[2]</sup>.

Socrates, however, interrogates this conventional bound conception through a thought experiment<sup>[2]</sup>: "If a friend, when in his right mind, deposited weapons with you and then asks for them when he is out of his mind, ought you to return them? No one would say you should, or that such a man is 'just' for doing so."

Subsequently, *Polemarchus*, as the successor of *Cephalus*, further adjusted and refined his father's concept of justice. He attempted to invoke the ancient Greek poet *Simonides*' maxim—"Justice consists in rendering to each his due"—to circumvent the potential contradictions in *Cephalus*' original formulation. Socrates, however, guided *Polemarchus* to interrogate the ontological basis of this "due." By analogizing justice to the craft, such as medicine's end being bodily health, cookery's end being seasoning, and the judge's craft being virtue. Socrates exposed *Polemarchus*' reliance on conventional morality.

When *Polemarchus* asserted that justice entails "the craft helping friends and harming enemies," Socrates deconstructed this through dialectical irony: If justice is useful only when the craft fails, then justice becomes a supplement to incompetence rather than an independent virtue. This reduces justice to an instrumental value, contingent on external circumstances rather than intrinsic goodness. *Polemarchus*' final claim, "justice is useful for the useless," collapses into self-refutation, as Socrates demonstrates that such a definition negates justice's essence as a virtue.

Ultimately, the intervention of *Thrasymachus* shattered the superficial consensus in the debate on justice. He invoked the example of *Polydamas* to assert his radical thesis: "Justice is nothing other than the advantage of the stronger." According to *Thrasymachus*: The ruling class establishes laws as instruments of domination; The subjects must obey these laws, which constitute "conventional right"; True justice, for the rulers, lies in maximizing their natural advantage through regime manipulation. Socrates dismantles this position through the irony: If rulers err in discerning their true interest, their laws would become self-defeating<sup>[3]</sup>. This exposes *Thrasymachus*' conflation of apparent power with true political art.

The Telos of craft: Socrates reorients the debate toward the intrinsic end of governance. Just as medicine aims at health rather than the physician's profit, true statesmen must serve the "common good" through education that elevates the moral nature of citizens. *Thrasymachus*, clinging to the Sophist dogma, insists that ruling is a craft for subsistence akin to shepherding, where the ruler's aim is exploitation. Socrates attempted to lead *Thrasymachus* to focus on the essential purpose of the art of governance, regarding it as a natural teleology in a skill that enhances the morality of the governed, and to draw the conclusion that "natural right" is more beneficial everywhere.

In conclusion, Plato's conception of "true justice" transcends the conventional notions defended by *Cephalus*, *Polemarchus*, and *Thrasymachus*. Socrates' dialectical pursuit reveals that genuine justice is rooted in natural teleology, it is "the intrinsic harmony of the soul," whereby each part fulfills its natural function. Contrary to the "conventional right" advocated by the interlocutors, whether as "truth-telling" (*Cephalus*), "helping friends and harming enemies" (*Polemarchus*), or "the advantage of the stronger" (*Thrasymachus*). Socrates' justice embodies "natural right." This justice is not merely a social contract but the actualization of the soul's telos, which spontaneously engenders flourishing through alignment with the cosmic order. As the cornerstone of Plato's philosophy, this teleological justice fundamentally shapes his educational theory. By orienting education toward cultivating the rational soul, Plato's "natural education" becomes a divine intellect, guiding individuals to perceive justice not as external conformity but as internal harmony with nature's order.

## 2. The education of natural right: The essence of Plato's educational thought

In the Hellenic context, “paideia” signified “nurturing children.” *Werner Jaeger* rightly identified “paideia” as the “soul of Hellenism,” a fusion of cultural, religious, and political forces that molded citizens in accordance with “Form of the Good.” Plato's natural education, grounded in his theory of “natural right,” is systematically expounded in *The Republic*. Through the allegory of the cave, Plato reveals education not as information transfer but as the “turning of the soul” toward truth and virtue. This process operates through three dialectical tiers: “Theoretical Basis,” “Practical Principles,” and “Fundamental Goal.” By orchestrating this “guidance of souls,” Plato's education achieves “the natural order harmony” in both individual and political unity, where justice is the health of the soul actualized through “paideia.”

### 2.1. Theoretical basis: The natural pursuit of the Form of the Good

The foundation of Plato's natural education lies in liberating the soul from the bondage of the visible realm through dialectical training. In *The Republic*, Plato prescribes arithmetic games and geometric exercises not merely as intellectual tools but as psychagogic instruments to awaken the soul's innate affinity for the “Form of the Good.” This “natural enlightenment” constitutes a radical critique of traditional poetic “paideia,” which Plato deemed a mimetic deception.

In archaic Greece, poets functioned as the custodians of mythopoeic wisdom that rooted human order in fate and divine will <sup>[4]</sup>. *Werner Jaeger* noted, this “mythical education” fused cultural, religious, and political norms into a cosmic order. However, with the rise of the polis, poetic paideia degenerated into ideological indoctrination, reducing truth to image and virtue to unexamined belief.

Plato's condemnation stems from poetry's ontological deficiency: Firstly, poetry as Mimetic Deception. Tragic and epic poetry, by imitating human passions rather than divine nous, traps the soul in doxastic oscillations between “true” and “false,” “good” and “evil” <sup>[2]</sup>. Secondly, Political Peril. The “stimulating elements” in Homeric epics, such as Achilles' wrath or Odysseus' cunning, corrupt the soul of guardians, breeding anarchy in the polis <sup>[2]</sup>.

Contrasting poetic, Plato's mathematical paideia initiates a noetic ascent. By contemplating number itself, the soul purges sensory illusions and apprehends immutable being <sup>[2]</sup>. The study of ideal forms in geometry reawakens the soul's prenatal knowledge of the “Form of the Good.” As Plato declares, “The Form of the Good is right and beautiful forever. Every soul pursues it as the ultimate telos, though most grope blindly as in a dream.” <sup>[2]</sup>. Thus, natural education's primary task is to orient the soul toward the “Form of the Good,” which alone grants true knowledge and flourishing.

### 2.2. Practical principle: The natural turn of the soul

The practical principle of Plato's natural education lies in achieving the “turning of the soul” through the natural arousal of eros and rational desire. For Plato, the soul operates according to its natural motion, unconstrained by conventions. The rational part must govern the spirited part and appetitive desires toward harmony <sup>[2]</sup>.

In the Allegory of the Cave, Plato dramatizes this transformation: prisoners chained in darkness gradually ascend to the sunlight through a self-propelled noetic process. This ascent is driven not by external coercion but by the soul's innate erotic longing for truth <sup>[2]</sup>.

In Plato's theory, “pleasure” as “desire” can be divided into threefold. The first is the “Appetitive Hedonē,” which is derived from material wealth. The second is the “Thymoeidic Hedonē,” which is rooted in honor. The third is the “Noetic Hedonē,” which is found in philosophical contemplation. While the first two belong to the

phenomenal world, noetic hedone transcends them as the highest good, unifying all desires under wisdom. Thus, philosophical eros becomes the true path to eudaimonia.

Therefore, in *The Republic*, Plato prescribes music and physical training as natural tools for harmonizing the soul. In Plato's view, "music," with its unique "mode," can guide children's "love and desire" to a higher level of "restraint." The "physical training" can discipline the body to purify primitive desires. They can naturally harmonize the passion and desire in children's souls and help them complete the natural transformation from a "bronze" to a "silver" before the age of 12, and prepare for the final ascent to "gold" <sup>[2]</sup>. Plato's way of educational practice is to achieve the natural transformation of the human soul through the natural awakening of the soul and the stimulation of love and desire. This principle of "paideia" is not the indoctrination of external "customs" but rather enabling the educated to naturally pay attention to the inherent virtues of things, consciously pursue a good life, and achieve the natural harmony of the soul.

### 2.3. Fundamental objective: The natural harmony of the polis order

The ultimate goal of Plato's natural education is to realize the intrinsic harmony of the soul's order through "soul-turning," thereby achieving natural harmony at the level of the polis. For Plato, each citizen's role in the polis must align with their natural rank and innate talent. Though all humans are born from the "Earth Mother" mythos <sup>[2]</sup>, nature endows them with hierarchical aptitudes: "Gold for philosopher-kings, silver for auxiliaries, iron and bronze for producers." <sup>[2]</sup>. This myth of metals symbolizes the ontological correspondence between the tripartite soul and tripartite polis <sup>[2]</sup>:

- (1) λογιστικόν (gold/rational part) → Philosopher-Kings (wisdom)
- (2) θυμοειδές (silver/spirited part) → Guardians (courage)
- (3) ἐπιθυμητικόν (iron and bronze/appetitive part) → Producers (temperance)

Indeed, all are brothers, but the nature shaped us incorporated gold into those who could become rulers at the time of creation, making them the most noble; and silver was injected into the assistants or guardians. As for farmers and other artisans, they endowed iron with the characteristics of copper. In Plato's view, the choice and granting of city-state identities were not based on customary identities and ranks, but rather on the natural matching and selection of individuals themselves, engaging in different positions in accordance with people's distinctive natural natures <sup>[5]</sup>.

According to this distribution method, the duties of the polis can flow naturally along with the natural changes of the soul. Everyone can naturally find a position that suits them based on their own soul characteristics and achieve natural division of labor, and this precisely constitutes the foundation of the harmony of the polis. In *The Republic*, Plato described: "If among their offspring there are those mixed with copper and iron, they must have no compassion at all. Instead, after making an assessment of their value in accordance with their nature, they must be abandoned among artisans or farmers." On the contrary, if a person who is mixed with gold or silver emerges from the latter, after making an evaluation, the former must be promoted to the position of guardian, and the latter to the position of assistant or guard. The natural order of the human soul should naturally determine the harmonious order of the polis, all based on natural nature and free from external customs and ritual regulations. Therefore, the fundamental goal of Plato's natural education lies in achieving the internal harmony of the soul order through the natural stimulation of the human soul, and thereby naturally realizing the harmony of the polis order.



### 3. Contemporary implications of Plato's philosophy

Plato's natural education embodies natural teleology. Its rationality lies in addressing the Socratic question, "How ought one to live?" through dialectical pursuit of the "Form of Good." Its naturalness stems from classical rationalism's fusion of nature and reason, manifesting humanity's innate erotic striving toward virtue and wisdom.

This "paideia" concerns the whole person, the natural bond between the individual soul and the political community. By cultivating recollection of the Forms, it enables autonomous actualization of noble virtues, thereby realizing "natural right" as the harmonic order of existence <sup>[2]</sup>. Plato's genius lies in mediating "natural right" and "conventional justice" through "paideia." Education becomes the art of intermediacy that weaves the soul's erotic ascent into the polis' nomotic framework. As Strauss observed, "The philosopher's return to the cave signifies not resignation but the political duty to translate contemplation into action, elevating the city toward natural hierarchy while respecting its conventional necessities" <sup>[1]</sup>. In today's education, teachers should also pay attention to the intellectual development of the educated while emphasizing the improvement of their inner virtues. While paying attention to how the educated become "Good Citizen," we should also attach importance to how the educated become "Good Men." This is not only the fundamental requirement of "education" as an activity of "nurturing," but also the fundamental direction for educators to implement towards "flourishing."

### Disclosure statement

The author declares no conflict of interest.

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# Research on the Implementation Path of Integrating MOOC and Blended Learning in Oncology Education

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**Abstract:** Oncology covers a wide range of knowledge and is more difficult compared to other clinical disciplines. Therefore, it is crucial to seek an efficient teaching method for oncology education. In recent years, China's internet technology has achieved rapid development. Massive Open Online Course (MOOC), a blended learning approach based on internet technology, has strong applicability to medical education. It can not only improve teaching quality but also promote further reform of the discipline. Based on this, our study searched for relevant research at home and abroad and reviewed the implementation path of integrating MOOC and blended learning in oncology education. This provides a theoretical foundation for the innovation of oncology teaching models, improves the level of oncology teaching, and lays a solid foundation for talent reserves in oncology departments.

**Keywords:** Massive open online course; Blended learning; Oncology teaching; Implementation path; Research progress

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## 1. Introduction

With the rapid development of society and the continuous replacement of times, China's requirements for oncology education are getting higher. As an independent discipline with strong professionalism and complex pathogenesis, oncology has high requirements for a comprehensive understanding of diseases <sup>[1]</sup>. Moreover, in recent years, many oncology-related marginal disciplines have emerged, which has also increased the difficulty of oncology teaching to some extent. Since the application of internet technology to medical teaching, significant changes have occurred in teaching models, gradually shifting from teacher-led to student-led. Supported by various open online courses, Massive Open Online Courses (MOOCs) have emerged. This model can effectively cultivate students' independent learning abilities, thus solving the difficult problems in oncology teaching <sup>[2]</sup>. Based on this, our study reviewed the implementation path of integrating MOOC and blended learning in oncology education. Firstly, we analyzed the current teaching situation of oncology and reviewed the development of MOOC blended learning. Finally, we explored the implementation path of integrating

## **2. Analysis of the current situation and development of oncology teaching**

### **2.1. Current situation of oncology teaching**

As a clinically common disease, cancer poses a significant threat to patients' physical and mental health due to its complexity and difficulty in treatment. With the increasing aging of the population in China and severe environmental pollution, the prevalence of cancer is continuously rising. Relevant research <sup>[3]</sup> directly points out that over 14 million people are diagnosed with cancer every year, making it a leading cause of human death. Early diagnosis and prompt treatment are crucial. In this context, it is essential to have a group of highly qualified oncology talents. Oncology involves a wide range of knowledge and complex content, including basic knowledge of pathology, physiology, biochemistry, immunology, and clinical operations. Based on different tumor types, cancers can be classified as gastric cancer, intestinal cancer, lung cancer, liver cancer, and cervical cancer. Therefore, learning oncology well is crucial, and it places higher demands on medical students. It is necessary to strengthen students' skill training to improve their professional level. Teachers should also update their teaching philosophy to enhance teaching quality and improve students' learning effectiveness <sup>[4]</sup>. Although oncology teaching has developed for a long time, as a practical and interdisciplinary subject, both teaching and learning difficulties are relatively high. Clinical application requires high operational ability and theoretical knowledge from students. Therefore, effective teaching methods are crucial for medical students to improve their learning effectiveness. Relevant studies have shown that efficient teaching methods can effectively increase medical students' enthusiasm for learning and enhance their understanding.

### **2.2. Development of oncology teaching**

Currently, oncology teaching mainly focuses on mastering disease pathogenesis, etiology, diagnosis, and treatment. Traditional teaching methods are relatively monotonous, with boring course content. They emphasize theoretical knowledge while lacking practical operation teaching, making it difficult to stimulate students' subjective initiative. Additionally, in traditional teaching, case resources are limited, resulting in low interest in teaching content and poor teaching effectiveness. Furthermore, research indicates significant differences in learning abilities among students, and traditional teaching methods cannot cater to every student, compromising teaching effectiveness <sup>[5]</sup>. In terms of evaluation, traditional teaching mainly relies on written tests, which are relatively one-dimensional and do not focus on the learning process, hindering the improvement of students' comprehensive abilities. In recent years, with continuous industrial reforms, relevant education departments have proposed corresponding measures to reform medical education models and cultivate new medical talents. Curriculum, as the core of teaching, is crucial for teaching activities and is designed based on students' needs.

## **3. Analysis of the development of hybrid teaching in MOOCs**

Massive Open Online Courses are open courses that originated with Western professors uploading their lectures to online platforms <sup>[6]</sup>. Many people learn on these platforms, forming a large, open online course community. This type of platform entered China in 2012, aligning perfectly with the development of the information age in our country and meeting the diverse learning needs of many learners. Under this teaching

model, the platform collaborates with renowned teachers to develop corresponding courses. For different knowledge points, there are 8–15 minutes of teaching videos combined with homework and online quizzes, open to learners on the platform. Unlike other online teaching platforms, MOOCs are open and free to everyone, offering a high degree of freedom. The teachers on the platform are generally well-known and highly qualified, ensuring the quality of the course content. Additionally, MOOCs exhibit the characteristics of micro-courses, with a strong systematic approach that breaks the limitations of traditional teaching, ensuring the sharing of high-quality teaching resources, enriching learning content, and accelerating classroom reform. MOOCs have revolutionized teaching and Internet technology, playing a significant role in meeting the training requirements of high-quality medical talents.

In recent years, MOOCs have become increasingly sophisticated, giving rise to hybrid teaching methods based on MOOCs. Some scholars define it as a fusion of on-campus learning and large open online courses, cleverly combining online and offline teaching<sup>[7]</sup>, and integrating traditional teaching resources with online teaching resources. This represents a more comprehensive teaching method in the information age. Under this teaching model, medical students studying oncology have more flexible study time and can access quality learning resources. The development of MOOCs has undergone a paradigm shift from connectivism (cMOOC) to behaviorism (xMOOC). Early cMOOCs emphasized the networking of knowledge, but due to unmet expectations in teaching effectiveness, they did not gain widespread recognition. On the other hand, xMOOCs, with their structured content aligning with traditional learning habits, have become mainstream. However, the format of MOOCs remains relatively uniform, making it difficult to meet the needs of deep learning. The combination of MOOCs and hybrid teaching is an inevitable choice for the informatization reform of higher education. Through technological empowerment and teaching innovation, this model effectively breaks the temporal and spatial limitations of traditional classrooms and addresses the lack of interaction in MOOCs, providing a new path for cultivating innovative talents. Nevertheless, sustainable development still needs to overcome practical challenges such as technology adaptation and teacher capacity building. Future research should focus on establishing long-term mechanisms for hybrid teaching, promoting the dual goals of educational equity and quality improvement.

## **4. Application of the integration of MOOC and blended learning in oncology education**

### **4.1. Application of MOOC in oncology education**

MOOC platforms can provide high-quality teaching resources for oncology education, mainly involving case analysis, teaching videos, academic lectures, etc. This can not only compensate for the uneven quality of teachers in traditional teaching but also effectively solve the problem of limited teaching resources, providing students with better learning conditions. Studies have pointed out that MOOCs have good openness and freedom, allowing students to learn according to their own time and effectively improving their autonomous learning abilities. In addition, MOOC platforms also feature discussion areas and Q&A sections, providing students with opportunities for communication and promoting resource sharing. Some studies have combined the MOOC teaching model with traditional teaching, effectively integrating online and offline teaching to impart basic knowledge, while offline classrooms can focus on analyzing difficult problems, further improving teaching effectiveness. However, in the MOOC teaching model, oncology also faces certain challenges. MOOCs require a stable network environment and advanced equipment support. In some remote areas, there may be issues such as unstable networks and incomplete equipment, which have a significant

impact on the application of MOOCs. Based on the differences in students' autonomous learning abilities, some students may not be able to adapt to the MOOC autonomous learning model. Therefore, effective incentives must be provided to better utilize MOOC resources.

## **4.2. Integration of MOOC and blended learning in oncology education**

The teaching model that integrates MOOC and blended learning requires dividing the teaching phase into pre-face-to-face online learning, face-to-face teaching, post-face-to-face online learning, and staged testing. Pre-face-to-face online learning involves completing online learning on the MOOC platform before formal instruction begins. In face-to-face teaching, teachers conduct classroom instruction online and discuss difficult points encountered during the learning process. Post-face-to-face online learning involves students engaging in extended learning on the MOOC platform after the course ends. Staged testing allows for a timely understanding of students' learning progress and adjustment of teaching strategies. A study compared the teaching effectiveness of the integrated MOOC and blended learning model with traditional teaching using undergraduate students as the research subjects. The results showed that the integrated MOOC and blended learning model can effectively improve students' average exam scores. Moreover, the MOOC and blended learning model has significant advantages in enhancing students' learning enthusiasm and initiative, as well as improving learning efficiency and effectiveness. Other studies <sup>[8]</sup> have also pointed out that the integration of MOOC and blended learning can boost students' learning enthusiasm and initiative, enhancing their mastery of knowledge and learning efficiency.

## **5. Conclusion**

Through a systematic review and analysis of relevant literature on the implementation pathway of integrating MOOC and blended learning in oncology education, it becomes clear that this integrated model brings many changes and opportunities to oncology education. By combining the advantages of MOOCs, such as large scale, openness, and resource richness, with the blended learning concept, an innovative model of online and offline deep collaboration is constructed for oncology teaching. This effectively compensates for the limitations of traditional teaching models in terms of resources, time, and space. This model is expected to play a greater role in oncology talent cultivation, pushing oncology education to new heights and laying a solid foundation for cultivating more excellent oncology professionals.

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