

Analysis on the Innovative Path of Ideological and Political Course Teaching Empowered by AR Technology

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Abstract: In the context of the digital age, ideological and political course teaching is facing challenges and opportunities, and the development of AR technology makes it possible for its innovation. This research comprehensively uses a variety of methods to elaborate on the connotation and characteristics of AR technology as well as the teaching objectives and requirements of ideological and political courses, and explores the theoretical basis for the integration of the two. Through case analysis, it shows its effectiveness in improving students' knowledge mastery, interest stimulation, and value shaping. It constructs the online teaching mode of ideological and political courses empowered by AR technology, including resource integration, activity design, and effect evaluation; and explores offline teaching practices, such as innovative classroom applications and the expansion and deepening of practical teaching. The empirical analysis of the effectiveness of the online and offline integrated teaching shows that it has a positive impact on students' learning, but it also faces challenges such as technology, teacher capabilities, teaching resources, and student adaptability, and corresponding strategies are proposed. The research confirms that this integrated teaching has significant advantages. Looking forward to the future, the application prospect of AR technology in ideological and political course teaching is broad, aiming to promote the high-quality development of ideological and political course teaching.

Keywords: AR technology; Ideological and political course teaching; Innovative path

Online publication: April 29, 2025

1. Introduction

1.1. Research background and significance

In today's digital age, ideological and political course teaching is facing many challenges and opportunities. On the one hand, the traditional teaching mode of ideological and political courses is difficult to meet the increasingly diversified learning needs of students to some extent, and students have a higher demand for vivid and interactive teaching methods. On the other hand, the rapid development of information technology provides a broad space for the innovation of ideological and political course teaching. As an emerging educational

technology, augmented reality (AR) has unique advantages. It can integrate virtual information with real scenes and bring a new experience to ideological and political course teaching. The application of AR technology in ideological and political course teaching is helpful to innovate the teaching mode, improve the education quality, make ideological and political courses better understood and remembered by students, and cultivate students' correct world outlook, outlook on life and values ^[1].

1.2. Research status at home and abroad

Foreign countries have carried out extensive research in the field of AR technology education applications. For example, Azuma (1997) explored the basic theory and early application of AR technology, laying a foundation for subsequent research ^[2]. In terms of educational practice, some schools in developed countries have applied AR technology to multidisciplinary teaching and achieved certain results. In China, the research on the application of AR technology in education is also deepening. Some scholars have explored its application potential in college course teaching ^[3]. However, there are relatively few systematic studies on the application of AR technology in ideological and political course teaching. This research will focus on ideological and political courses teaching to fill the gap in targeted research in this field.

2. Theoretical overview of AR technology and ideological and political course teaching

2.1. Connotation and characteristics of AR technology

AR technology is a technology that superimposes virtual information on the real world in real time to realize the integration of virtual and real. It has remarkable characteristics such as the integration of virtual and real, real-time interaction, and three-dimensional presentation. According to the Reality-Virtuality Continuum Theory proposed by Milgram *et al.* (1994), AR technology is located between the real environment and the virtual environment and can provide users with a unique immersive experience ^[4]. In the field of education, this characteristic enables students to access abstract knowledge content in familiar real scenes, enhancing the intuitiveness and interest of learning and helping to improve students' learning enthusiasm and participation.

2.2. Theoretical basis for AR technology empowering ideological and political course teaching

According to the spirit of documents such as "Several Opinions on Deepening the Reform and Innovation of School Ideological and Political Theory Courses in the New Era," ideological and political course teaching aims to achieve multiple goals such as knowledge imparting, value shaping, and ability cultivation ^[5]. From the perspective of educational technology, AR technology provides new teaching means and resource presentation methods for ideological and political course teaching, enriching the teaching media. The constructivist learning theory believes that learning is when students obtain knowledge through meaning construction by means of necessary information with the help of others in a certain situation. AR technology can create realistic learning situations, such as simulating historical event scenes, which is conducive to students' knowledge construction. The situational cognition theory emphasizes the interdependence of knowledge and situation ^[6]. The application of AR technology in ideological and political course teaching can place ideological and political knowledge in specific historical and social situations, promoting students' understanding and transfer of knowledge, thus providing a solid theoretical basis for the integration of AR technology and ideological and political course teaching.

3. Case analysis of the application of AR technology in ideological and political course teaching

3.1. AR/VR ideological and political classroom project of Penglai No. 1 Middle School

Penglai No. 1 Middle School actively explores the application of AR technology in ideological and political course teaching and has built an AR/VR ideological and political classroom. This classroom is equipped with advanced hardware facilities such as head-mounted display devices and interactive handles, and at the same time, a virtual teaching resource library covering each chapter of the ideological and political teaching materials has been developed (according to the internal teaching materials of Penglai No. 1 Middle School)^[7]. In teaching practice, for example, when explaining the course “Outline of Modern and Contemporary Chinese History,” teachers use AR technology to allow students to immerse themselves in historical events and see battlefields filled with smoke. Students can see the smoky battlefield, the scene of signing unequal treaties, etc. Through the questionnaire survey of students, it is found that the students participating in this project teaching have significantly improved their knowledge mastery, significantly enhanced their learning interests, and have a deeper understanding of relevant historical events. The average score is about 10% higher than that of the classes not participating in the project (referring to the teaching achievement statistics of Penglai No. 1 Middle School).

3.2. The virtual simulation ideological and political course experience teaching center of Southeast University

The virtual simulation ideological and political course experience teaching center of Southeast University has carried out a variety of teaching activities^[8]. In this teaching mode, students’ classroom participation has been greatly improved, and the number of active questions and discussions has increased^[9]. According to the statistical data of the center, after the implementation of AR technology teaching, students’ satisfaction with ideological and political courses has increased from 60% to 80%. Students have also achieved good results in value shaping, have a deeper understanding of the connotation and value of the Long March spirit, and show stronger dedication spirit and teamwork consciousness in social practice activities (based on the teaching practice feedback report of Southeast University).

4. Construction of the online teaching mode of ideological and political courses empowered by AR technology

4.1. Online resource integration and platform construction

Integrate various high-quality ideological and political teaching resources, such as the online virtual exhibition resources of the National Museum of China, historical documentaries, etc., to build an online teaching resource library for ideological and political courses. Build a fully functional teaching platform, such as using learning management systems (LMS) such as Moodle to achieve functions such as resource sharing, communication and interaction, and teaching management^[10]. Teachers can upload AR teaching courseware, videos and other resources on the platform, and students can learn anytime and anywhere, and communicate and interact with teachers and classmates through the online discussion area to share learning experiences and insights.

4.2. Teaching activity design and implementation

Design diversified online teaching activities, such as carrying out “Online Theme Discussion on Red Culture.” Teachers put forward topics about the inheritance and development of red culture, and students collect and

analyze materials with the help of AR resources such as virtual red memorial halls, and then express their views in the discussion area. Organize group project cooperation, such as taking “Innovation Practice of Ideological and Political Courses in the New Era” as the theme, each group uses AR technology to design ideological and political course teaching plans, and improves students’ innovation ability and teamwork ability through online display and mutual evaluation. In the implementation process, teachers should give full play to their guiding role, answer students’ questions in time, encourage students to actively participate, and use the interactivity and interestingness of AR technology to enhance the attractiveness and practicality of teaching.

4.3. Learning effect evaluation and feedback

Construct a scientific and reasonable learning effect evaluation index system, including aspects such as knowledge test scores, online discussion participation, and project completion quality. Use data mining technologies such as the Apriori algorithm to analyze students’ learning behavior data on the platform, such as learning time, resource access frequency, etc., combined with learning analysis technologies such as learning path analysis to comprehensively understand students’ learning situation ^[11]. According to the evaluation results, provide personalized feedback and guidance for students, such as pushing targeted AR learning resources for students with learning difficulties to help them consolidate knowledge and improve learning effects.

5. Practical exploration of offline teaching of ideological and political courses empowered by AR technology

5.1. Innovative application in classroom teaching

In the classroom teaching of ideological and political courses, teachers use AR technology to create vivid teaching situations. For example, when teaching “Principles of Marxist Philosophy,” teachers use AR technology to show the mutual relationship between matter and consciousness, transforming abstract philosophical concepts into intuitive visual images. For example, when showing the active role of consciousness in matter, a virtual scene of human beings transforming nature is presented. This helps to promote teacher-student interaction. Teachers can guide students to observe the scene and ask questions, and students actively answer and participate in the discussion. At the same time, students are encouraged to personally experience the AR teaching content. For example, when teaching “Core Socialist Values,” students participate in virtual community construction activities through AR devices to understand the connotation and application of values in practice, improving the vividness and participation of classroom teaching ^[12].

5.2. Expansion and deepening of practical teaching

Apply AR technology to the practical teaching link of ideological and political courses. When visiting patriotic education bases on the spot, students can use AR guide applications to obtain more stories and knowledge behind historical relics and cultural relics, enriching the visiting experience. Carry out social practice surveys based on AR technology, such as investigating the current situation of local red cultural resources. Students use AR technology to produce promotional materials and design virtual display schemes, enhancing students’ understanding and application ability of theoretical knowledge, and at the same time improving students’ social practice ability and social responsibility.

6. Achievements and challenges of AR technology empowering the blended teaching of ideological and political courses online and offline

6.1. Empirical analysis of teaching achievements

Through conducting questionnaires in many schools that implement AR technology to empower the blended teaching of ideological and political courses online and offline, a total of 1,000 valid questionnaires were collected. The results show that 80% of the students think that this teaching method helps to improve their learning interest in ideological and political courses. By comparing students' grades, it is found that the average grade of classes participating in blended teaching in the final examination is about 15 points higher than that of classes not participating. Classroom performance observations also indicate that students pay more attention in class and the number of voluntary speeches increases. In terms of value formation, students show stronger abilities in moral judgment and behavioral choice in social practice. For example, in community volunteer service activities, students participating in blended teaching are more active in taking responsibilities and practicing the Core Socialist Values, fully proving that blended teaching has a positive promoting effect on students' knowledge mastery, ability improvement and value formation ^[13].

6.2. Challenges and coping strategies

In the process of blended teaching, many challenges are faced. In terms of technology application, there may be problems such as device compatibility and insufficient software stability in AR technology. In response to this, schools should strengthen the construction of technical maintenance teams, regularly update and optimize equipment and software to ensure the stable operation of the technology. In terms of teachers' abilities, some teachers have a limited mastery of AR technology and it is difficult for them to carry out teaching effectively. It is necessary to carry out teacher training work, such as organizing training seminars on the teaching application of AR technology, inviting experts to conduct technical training and teaching guidance, and improving teachers' information technology literacy and teaching abilities. In terms of teaching resources, high-quality AR teaching resources for ideological and political courses are relatively scarce. Schools, enterprises and scientific research institutions should be encouraged to cooperate in multiple ways to jointly develop a rich variety of teaching resources and establish a resource-sharing platform. In terms of students' adaptability, some students may have difficulties in adapting to the new teaching methods. Teachers should strengthen guidance, introduce teaching processes and methods in detail in the early stage of teaching, encourage students to actively try, and gradually improve students' adaptability and participation.

In terms of knowledge imparting, with the help of AR technology, abstract knowledge is visualized, helping students to understand and remember better; in terms of value shaping, through immersive experiences, students' sense of identity and ability to practice values are enhanced; in terms of ability cultivation, students' innovative thinking, practical ability and teamwork ability are exercised.

Looking ahead, with the rapid development of science and technology, the application of AR technology in the teaching of ideological and political courses has a broad prospect. On the one hand, AR technology will continue to be updated and iterated, and its immersion and interactivity will be further enhanced, and it is expected to create more realistic teaching situations and achieve a smoother human-computer interaction experience ^[14]. For example, in the future, it may be possible to achieve in-depth interactive learning of multiple people in the same virtual scene at the same time ^[15]. On the other hand, the teaching model will continue to be innovated, and the integration of online and offline will be closer and seamless, forming a more complete "blended teaching" ecology. Meanwhile, the trend of interdisciplinary integration will be more obvious.

AR technology will have in-depth intersections with multiple disciplines such as pedagogy, psychology and communication, providing more scientific and comprehensive theoretical and practical guidance for the teaching of ideological and political courses. Subsequent research can focus on the precise teaching application of AR technology in the teaching of ideological and political courses, such as providing customized teaching content according to students' differences; improving the teaching evaluation system and establishing more scientific and comprehensive evaluation indicators for blended teaching; exploring how to better use AR technology to promote the international dissemination and communication of ideological and political courses to promote the teaching of ideological and political courses to keep up with the pace of the times and achieve high-quality and sustainable development.

Funding

2025 Jiangsu University Philosophy and Social Sciences Research Special Project on Ideological and Political Education, "Research on Innovative Approaches to AI-Empowered Party History Education"

Disclosure statement

The author declares no conflict of interest.

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