Immersion and Resonance: Constructing an Embodied Cognition Teaching Model for Ideological Education Empowered by VR Technology

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Abstract: Driven by the digital revolution, virtual reality (VR) technology, as a cutting-edge innovation, is gradually reshaping the pedagogical landscape of ideological and political theory courses. Grounded in the theoretical framework of embodied cognition, this paper explores the construction of an intelligent educational ecosystem for VR-empowered ideological and political education, aiming to transcend the limitations of traditional "disembodied learning." By analyzing the triadic interaction mechanism among "body–environment–cognition," the study proposes a VR-based teaching model characterized by immersive experience and emotional resonance, termed the "embodied cognition" model for ideological and political courses. The operational logic of this model is elaborated across four dimensions: situational embodiment, experiential embodiment, interactive embodiment, and evaluative embodiment. Furthermore, the research critically examines potential risks associated with technological application, including subjectivity erosion, cognitive bias due to emotional overstimulation, and ethical dilemmas, while proposing corresponding countermeasures. This work aims to provide theoretical and practical insights for the innovation of ideological and political education in the digital era.

Keywords: VR technology; Ideological and political courses; Embodied cognition; Teaching model; Immersive experience

1. Introduction

The rapid evolution of digital technologies is driving a profound paradigm shift in the teaching of ideological and political theory courses [1]. Nevertheless, traditional pedagogical approaches remain constrained by the dual challenges of "one-way indoctrination" and "disembodied cognition," overemphasizing abstract theoretical instruction while neglecting students' bodily engagement, emotional experiences, and contextual interactions

that are central to cognitive construction. This form of "neck-up education" creates a significant disconnect with contemporary university students, who are "digital natives" accustomed to interactive, sensory-rich, and personalized modes of learning [2]. In addressing increasingly individualized and diversified student needs, conventional models of ideological and political education face core challenges such as insufficient precision, limited reach, and difficulties in measuring educational outcomes [3].

To address these issues, it becomes imperative to empower ideological and political courses through VR technology, striving toward holistic education throughout all processes, domains, and participants ("three fulls" principle). Moreover, the inherent characteristics of VR, immersion, interactivity, and imaginative capacity, align closely with the principles of embodied cognition, which emphasize "mind-body unity" and "cognition as bodily grounded." Both paradigms reject Cartesian dualism and affirm that "the mind is the body's mind, and cognition is bodily cognition" [4]. Situated at the intersection of embodied cognition theory and VR-enabled pedagogy, this study focuses on two core features, immersion and resonance, to transcend the cognitive boundaries of traditional ideological and political education. It seeks to facilitate a transformative journey from passive knowledge reception to active value internalization, thereby contributing to the theoretical and practical innovation of ideological and political education in the digital age.

2. Theoretical foundation: The fusion logic of embodied cognition and VR technology

Embodied cognition emerged in the 1980s at the intersection of phenomenological philosophy and cognitive science, evolving into a pivotal perspective within cognitive studies. It represents a post-cognitivist turn following symbolic information processing and connectionist models, offering a new interpretation of how humans acquire knowledge [5]. The integration of embodied cognition with VR technology is not merely a technical addition but constitutes a deep restructuring of educational paradigms, one rooted in robust philosophical and scientific foundations, possessing strong theoretical coherence and pedagogical compatibility.

2.1. Philosophical and cognitive science foundations

Originating from the convergence of phenomenology and cognitive science, embodied cognition challenges the classical cognitivist view that treats the mind as an abstract symbol processor operating independently of the body, "disembodied cognition." Instead, it posits that cognition arises from the dynamic interplay between bodily perception, motor systems, and environmental interaction. As Maurice Merleau-Ponty stated: "The body is the medium through which a being exists in the world; to have a body means to be engaged in a specific environment, involved in certain projects, and continually situated within it" [6]. Within the context of ideological and political education, this implies that students' understanding and internalization of values and beliefs cannot occur in isolation from bodily sensation and experiential activity.

This theoretical premise resonates naturally with the affordances of VR technology. By delivering multisensory stimuli, enabling natural interaction, and reconstructing historical or moral scenarios, VR creates digital conditions conducive to bodily participation in cognitive formation. Thus, VR facilitates the reintegration of body and cognition within simulated environments, transforming abstract ideological concepts into perceptible, lived experiences.

2.2. Pedagogical compatibility analysis

Cognition is not a priori a logical faculty but a situated, evolutionary process shaped by context. Environment, therefore, serves as a prerequisite for cognition [7]. The fusion of VR technology with ideological and political education establishes a bidirectional human-technology interaction, fostering an organic learning ecosystem. Contemporary college students, as "digital natives," exhibit cognitive preferences marked by sensory orientation, visual literacy, and demand for interactivity. Traditional lecture-based instruction, centered on textual exposition, often fails to meet these emerging cognitive expectations.

VR-supported embodied learning environments represent a proactive response to this shift, a deliberate adaptation to digitally mediated educational contexts. From the standpoint of ideological and political education itself, its ultimate goal lies in facilitating the transition from intellectual comprehension to authentic value commitment. This transformation relies not only on rational understanding but also crucially on emotional arousal and contextual immersion as catalysts. Precisely because VR enables the synthesis of affective experience and rational reflection, it provides fertile ground for the emergence of genuine value identification.

2.3. Educational significance of VR in ideological education

In the domain of ideological and political education, the significance of VR extends beyond mere instructional tool innovation; it fundamentally reshapes the educational process. On one hand, VR opens novel pathways for experiential learning, expanding the scope of the "Great Ideological and Political Course" initiative into virtual practice spaces. On the other hand, it offers fresh solutions to the persistent problem of "knowledge-belief disconnection" (zhi xin fenli), where students may intellectually grasp ideals without emotionally embracing them. Through bodily engagement facilitated by VR, learners can achieve deeper internalization of values, making the critical leap from "knowing" to "believing."

3. Intelligent ecosystem: Core framework of VR-enabled embodied cognition teaching

Building upon the integrative logic of embodied cognition and VR technology, this study constructs an intelligent, efficient, and positive learning ecosystem characterized by "immersion and resonance." Within this ecosystem, human instructors and AI-driven systems collaborate synergistically, reflecting the emerging trend of "human-machine collaboration" as the future trajectory of teaching roles in the intelligent era. This collaborative framework gives rise to a four-dimensional embodied cognition teaching model: situational embodiment, experiential embodiment, interactive embodiment, and evaluative embodiment" [8].

3.1. Situational embodiment: Spatiotemporal dialogue between history and reality

Situational embodiment forms the foundational layer of the VR-enhanced teaching model. Its essence lies in recreating authentic contexts, historical events, social realities, or moral dilemmas, through scene reconstruction and environmental immersion, thereby establishing a virtual space conducive to bodily engagement in cognitive processes [9].

In this phase, VR transcends its role as a mere visual display tool, becoming a bridge connecting past and present, theory and emotion. Here, ideological and political educators co-create multidimensional temporal-spatial teaching contexts with VR-AI systems, ensuring organic alignment between virtual scenarios and pedagogical objectives. This demands that teachers transcend traditional boundaries of responsibility,

recognizing that digital literacy and digital survival capabilities have become essential dimensions of socio-personal development. Cultivating these competencies must be deeply integrated with mainstream value education, encompassing skills such as proficient use of digital tools, enhanced abilities in information filtering, analysis, and processing, as well as fostering interpersonal communication and collaboration in virtual spaces.

3.2. Experiential embodiment: Multisensory engagement and emotional resonance

Experiential embodiment constitutes the core of the teaching model, focusing on activating students' emotional responses via multimodal sensory channels to foster value internalization. This dimension draws directly from a central tenet of embodied cognition: affect, attitude, and values emerge through bodily perception and experience.

Multisensory immersion serves as the foundation of experiential embodiment. In VR practice, ideological and political educators should prioritize not only visual realism but also integrate auditory, haptic, and even olfactory feedback when feasible, thereby intensifying emotional immersion. Crucially, the mechanism of emotional resonance underpins this stage. To achieve this, the model incorporates a role-based task-driven approach, wherein students assume identities of historical figures (e.g., revolutionary soldiers, pioneers of reform), engaging in mission-oriented activities within reconstructed historical settings. Through role-playing, learners naturally develop empathetic identification with characters, forming affective bonds that deepen their moral and ideological understanding.

As such, VR enables the creation of "personalized, dynamic, and immersive educational scenarios," profoundly activating the inherent function of ideological and political courses in cultivating virtue and shaping character [10].

3.3. Interactive embodiment: Reconstructing subjectivity through praxis

Interactive embodiment represents the pivotal phase of the model, emphasizing intelligent interaction and active learner participation to reestablish students' subjectivity in ideological and political learning.

Intelligent interaction design provides the technical backbone. Advanced VR systems support gesture recognition, motion tracking, voice commands, and eye-tracking, empowering students to explore virtual environments autonomously. More importantly, subjectivity reconstruction is the central pedagogical aim. In traditional classrooms, students often function as passive recipients of knowledge; in contrast, within a VR-embodied learning environment, they become active agents, participants in action, constructors of meaning.

This shift aligns with broader goals of improving the quality and effectiveness of higher education ideological and political courses, promoting seamless integration between online and offline instruction, and achieving true internalization, entering the brain, touching the heart, and guiding behavior ("entering mind-heart-action") [11].

3.4. Evaluative embodiment: Precision assessment via behavioral analytics

Evaluative embodiment marks the innovative dimension of the model, leveraging behavioral data analytics and multidimensional assessment to achieve precise monitoring of students' learning trajectories.

Its novelty lies in shifting evaluation from singular knowledge tests to comprehensive assessments incorporating behavioral performance, emotional reactions, and cognitive outcomes. By doing so, it better reflects actual student conditions, supports practical teaching, strengthens the soul-shaping and virtue-nurturing

functions of ideological and political courses, makes classes more vibrant, engages students actively, and enhances educational efficacy [12].

VR systems can record real-time behavioral data, including gaze patterns, navigation paths, decision-making sequences, and interaction frequencies. These metrics offer objective indicators for assessing cognitive processing and affective states. Additionally, a multimodal evaluation system integrates behavioral data, emotional responses (e.g., via AI-powered facial expression or physiological signal analysis), and traditional cognitive outputs. In practice, combining AI emotion recognition with qualitative methods allows for a more holistic and nuanced assessment framework.

4. Critical reflection: Risks and transcendence in VR embodied models

The application of VR technology is never a value-neutral instrumental process. It inherently requires ideological and political educators to undergo profound role transformation and identity redefinition. The key does not lie solely in mastering the technology, but in maintaining a value anchor centered on humanistic orientation amidst the tide of technological advancement; this must remain the fundamental principle guiding educational practice.

4.1. Technological dependence and subjectivity dissolution

In embodied pedagogy, bodily action constitutes its phenomenological manifestation, while ethical awareness serves as its underlying rational core, both jointly shaping complete cognitive and value internalization. While VR enhances course engagement, it simultaneously raises concerns about technological dependence and the erosion of learner agency.

As German educator Johann Friedrich Herbart insightfully noted: "All educational work and the entirety of education can be summed up in the concept of morality; morality is humanity's highest purpose, and thus the highest aim of education" [13]. This observation reveals a fundamental tension in VR-based ideological education: the paradox between technological enhancement and subjective diminishment. When visual spectacle dominates instruction, students' attention may shift from ideological depth to sensory stimulation, potentially undermining critical thinking. Moreover, in an age of pluralistic knowledge and heightened individual autonomy, the mission of "cultivating virtue" and "nurturing morally grounded individuals" becomes ever more urgent [14].

To transcend this risk, the principle of "technology serving content" must be upheld. Educators must clearly recognize VR as a means rather than an end, avoiding technological spectacle at the expense of educational integrity. Furthermore, VR scenario designs should incorporate sufficient space for exploration, reflection, and creative input, safeguarding students' agency and creativity within virtual environments.

4.2. Emotional resonance and cognitive bias

Another potential pitfall lies in the contradiction between emotional resonance and cognitive distortion. While VR effectively stimulates emotional responses, excessive emotionalization may suppress rational deliberation, leading to oversimplified interpretations of complex historical or social realities.

In highly emotive VR experiences, students may become absorbed in affective immersion while neglecting deeper inquiry into historical context or theoretical nuance. A more profound concern involves the

epistemological gap between virtual simulation and real-world practice, which may generate cognitive biases. As Ye Lan argues: "Although modern technologies like computers have taken over some of teachers' tasks, the essence of schooling remains unchanged. Education is a profoundly human endeavor. The relationship between teacher and student should be an 'I-Thou' relationship, centered on dialogue and mutual understanding" [15].

To address this challenge, a complete pedagogical cycle of "experience–reflection–action" must be established. After VR immersion, instructors should guide students in critical reflection, helping them discern differences between simulated scenes and historical totality, and appreciate the complexity behind historical choices. Furthermore, linking virtual experiences with real-life social practice, such as community service, field visits, or policy debates, can help students achieve a balanced and accurate grasp of ideological theories.

4.3. Ethical dilemmas and data privacy

The widespread adoption of VR in ideological and political education also confronts serious ethical and privacy challenges. Addressing these issues is vital not only for pedagogical effectiveness but also for educational equity and technological ethics.

Physical discomfort is a common side effect of VR usage. Some students may experience dizziness, nausea, or eye strain during prolonged exposure, negatively impacting both learning experience and attitudes toward the course. To mitigate this, educators should accommodate individual differences by offering flexible participation options, such as shortening session durations or providing non-VR alternatives, ensuring inclusive access for all learners.

Data privacy presents another critical concern. Sensitive information collected by VR systems, including behavioral logs, gaze tracking, and biometric signals (e.g., heart rate, if mishandled or inadequately protected, could violate student privacy. Institutions must therefore establish stringent data governance policies, clearly defining the scope, purpose, and limits of data collection and usage, ensuring full compliance with privacy protection standards and informed consent protocols.

5. Conclusion

By creating multisensory, immersive virtual environments, VR technology offers an ideal pathway for realizing embodied cognition in ideological and political education. It effectively promotes a pedagogical transformation from disembodied learning to embodied cognition, and from knowledge acquisition to value internalization. However, the sustainable development of VR-enhanced ideological education must remain vigilant against risks such as technological dependency, subjectivity erosion, and emotional-cognitive imbalance.

The guiding principle must always be "technology serving educational content," ensuring that VR functions as a genuine empowering tool rather than a distracting spectacle. In the digital era, the deep integration of VR technology with ideological and political courses has become an inevitable trend in educational innovation. Only by adhering to the core principles of human-centered design, technological empowerment, and unity of knowledge and action can the unique advantages of VR in ideological and political education harnessed and cultivate a new generation of youth capable of shouldering the great mission of national rejuvenation.

Disclosure statement

The author declares no conflict of interest.

References

[1] Wang Y, 2024, Upholding Core Principles While Innovating: Promoting Connotative Development in Ideological and Political Course Construction. Studies in Ideological and Political Education, (5): 5–7.

[2] Li P, 2025, Research on Innovation in Ideological and Political Education Methods Under the Background of Digital Transformation. Cultural and Educational Materials, (4): 111–113.

[3] Yang B, 2020, Educational Innovation and Practice in Local Applied Undergraduate Institutions Under Digital Transformation. Journal of Higher Education Research, 41(4): 45–55.

[4] Ye H, 2015, The Body and Learning: Embodied Cognition and Its Challenge to Traditional Educational Paradigms. Educational Research, 369(4): 104–114.

[5] Zhang L, 2013, On the Curricular and Pedagogical Implications of Embodied Cognition Theory. Global Perspectives on Educational Development, 42(4): 27–32.

[6] Merleau-Ponty M, 2021, Phenomenology of Perception. The Commercial Press, Routledge.

[7] Hu W, 2019, The Role Dilemma of Teachers in the Age of Artificial Intelligence and Corresponding Action Strategies. Modern University Education, (5): 79–84.

[8] Yang X, 2024, Youth and Artificial Intelligence: Cognitive Attitudes and the Enhancement of Digital Literacy. People's Forum, (11): 59–61.

[9] Song L, Xu L, 2018, Exploring Pathways for Future Teacher Professional Development in the "AI" Era. China Educational Technology, (7): 73–80.

[10] Ma S, 2023, Digital Twin Technology and the Teaching Competence of Ideological and Political Theory Course Instructors in Higher Education Institutions. Journal of Heihe University, 14(12): 112.

[11] Zhou Y, Kang M, 2023, Research on Optimization Strategies for Ideological and Political Theory Courses in Higher Education Based on VR Technology. Journal of Beijing University of Posts and Telecommunications (Social Sciences Edition), 25(2): 1.

[12] Zhou H, 2018, Constructing a Practical Teaching System for Vocational College Ideological and Political Theory Courses From the Perspective of Field Theory. Education and Vocational Studies, (7): 89.

[13] Zhang H, 1979, Selected Works on Bourgeois Education in the West. People's Education Press.

[14] Luo S, 2020, A Study on the Construction of Teachers' Roles in the Intelligent Era, thesis, Southwest University.

[15] Ye L, 1998, Preliminary Exploration of Teachers' Professional Qualities in the New Century. Educational Research and Experimentation, (1): 41–46.