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The Realistic Review and Optimization Approach of Digital Intelligence Technology Empowering the Ideological and Political Leadership of Colleges and Universities

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Abstract: In the era of digital intelligence with the deepening of education digitization strategy, the construction of ideological and political leadership in colleges and universities has become the core issue of the construction of a strong education country. Based on the background of the integration and development of digital intelligence technology and ideological and political education, this paper closely follows the cognitive characteristics of 'Z generation' college students, takes 'from embedding to integration' as the core main line, systematically defines the core connotation of digital intelligence technology empowerment and ideological and political leadership in colleges and universities, and analyzes the internal mechanism of digital intelligence technology empowering ideological and political leadership through field extension, mode innovation and efficiency improvement. Combined with the latest research results and practical cases, this paper accurately examines the practical problems existing in the current integration process, such as the superficialization of technology, the lack of adaptability of subjects, and the imperfect risk prevention and control system. From the three dimensions of value guidance, path innovation and mechanism guarantee, this paper constructs the optimization path of "digital intelligence-ideological and political" deep integration, so as to promote the ideological and political education from the simple superposition of traditional advantages and technology empowerment to the deep integration of ecological reconstruction.

Keywords: digital intelligence technology; ideological and political leading force in colleges and universities; deep fusion; digitalization of education

Published: 02 March 2026



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1. Introduction

At present, the iterative evolution of big data, artificial intelligence, virtual reality and other digital intelligence technologies not only reshapes the paradigm of information dissemination, but also profoundly affects the thinking mode and values of 'Generation Z' college students. As a digital native generation, college students' natural needs for interactive experience and personalized learning make the disadvantages of traditional ideological and political education, such as "one-way indoctrination," "content abstraction" and "lagging evaluation," increasingly prominent, and the improvement of ideological and political leadership faces severe challenges. In this context, promoting the deep transformation of digital intelligence technology and ideological and political education from "embedding" to "integration" has become an inevitable choice for colleges and universities to implement the fundamental task of moral education and strengthen the leading force of ideological and political education. The national "14th Five-Year Plan for Digital Economy Development" clearly proposes to "promote the deep integration of digital technology and the real economy." This strategic orientation is also applicable to the field of ideological and political education. At present, some colleges and

universities have carried out the practical exploration of digital intelligence technology enabling ideological and political education, but most of them still remain in the surface stage of technology embedding, failing to achieve deep coupling with the core of ideological and political value. Therefore, it is of great time value and practical significance to systematically examine the internal mechanism and realistic dilemma of the ideological and political leadership enabled by digital intelligence technology and explore the optimization path of deep integration.

2. The Core Connotation and Internal Mechanism of Digital Intelligence Technology Empowering the Ideological and Political Leadership of Colleges and Universities

The core connotation of the deep integration of digital intelligence technology and ideological and political education in colleges and universities lies in the precise integration of technology empowerment and ideological and political leadership. The internal mechanism of technology empowerment can reveal how digital intelligence technology can re-conceive the ecology of political education and improve the leading efficiency.

2.1. Core Content

Digital intelligence technology empowerment refers to the integrated application of digital and intelligent technologies. Supported by big data, artificial intelligence, cloud computing, the Internet of Things, and 5G/6G communication technologies, it enables the deep integration of digitization and intelligent systems. Its core features include data-driven operation, human-machine collaboration, cross-domain coordination, intelligent decision-making, and open sharing. It can promote comprehensive changes in the educational ecosystem by optimizing content production processes, enabling precise information access, and constructing integrated virtual-physical learning environments. With the deep learning and data analysis capabilities of artificial intelligence, educators can analyze students' learning dynamics, behavioral patterns, and psychological characteristics based on large-scale data, thereby providing more targeted and adaptive educational support [1].

The leading force of ideological and political education in colleges and universities: The leading force of ideological and political education in colleges and universities is the core ability of colleges and universities to implement the fundamental task of cultivating people with morality. Digital technology is an important carrier to improve the productivity of ideological and political courses [2]. "Ideological and political education" focuses on the core goal of ideological and political education, that is, to shape students' correct world outlook, outlook on life, and values through systematic theoretical education and value guidance; "Leading" is different from the traditional "one-way indoctrination," emphasizing the way of guidance and driving to promote students to actively identify and practice the mainstream values. "Force" is a kind of comprehensive system ability, which is manifested in the continuous influence of colleges and universities on students' thoughts and behaviors through knowledge innovation, cultural infiltration, and practice cultivation. Its core goal is to cultivate new people with firm ideals and beliefs and a strong sense of social responsibility, and to build a strong ideological position in colleges and universities.

2.2. Internal Mechanism

The empowerment of digital intelligence technology to the ideological and political leadership of colleges and universities is not merely a single-dimensional technical support. Rather, through the organic linkage of field extension, model innovation, and efficiency improvement, a complete logical chain of "technology empowerment-scene reconstruction-value internalization" is constructed, thereby promoting the systematic improvement of ideological and political leadership.

Field extension: virtual and real symbiosis expands the boundary of ideological and political education. Traditional ideological and political education is limited to the time and space boundaries of the physical classroom, making it difficult to achieve all-round and sustainable value guidance. By constructing a virtual field parallel to the physical world, digital intelligence technology forms a new educational ecology of "virtual and real symbiosis." The virtualized and scenario-based teaching activities empowered by digital intelligence technology can actively mobilize various social resources to participate and play a collaborative educational role between ideological and political "small classrooms" and social "big classrooms" [3]. On the one hand, it breaks the barriers of time and space and realizes the ubiquity of educational supply. Students can access learning resources anytime and anywhere through online platforms, virtual classrooms, and other carriers, enabling ideological and political education to shift from the limited supply of "fixed time and fixed point" to the ubiquitous service of "anytime and anywhere." On the other hand, reconstructing the teaching relationship promotes the flattening of knowledge transfer. In the field of virtual and real integration, teachers are no longer the only authority center, and students are both learners and content creators. Multi-directional network interaction stimulates a sense of active participation and makes value guidance more naturally integrated into equal dialogue. While expanding the teaching field of ideological and political courses in colleges and universities, this approach brings a fresh and vivid teaching experience to college students, thereby realizing content immersion, sensory immersion, and cognitive immersion [4].

Model innovation: data-driven approaches achieve precise personalized teaching. Traditional ideological and political education easily falls into the dilemma of "flood irrigation," making it difficult to meet the differentiated needs of students. Driven by data, digital intelligence technology promotes the transformation of ideological and political teaching from "experience dependence" to "data evidence-based practice," realizing a paradigm shift toward precision and personalization. By integrating multi-source data such as students' online learning behavior, forum participation, test results, and social practice, a dynamic "digital portrait of students' thoughts" is constructed to accurately locate students' theoretical confusion points, interest focus points, and value resonance points. Teachers can also use visualization technology on intelligent learning platforms to present the logical relationships among knowledge points in the form of charts, helping students understand the knowledge system more intuitively [5]. With the help of adaptive learning technology, personalized learning paths are customized; the order, difficulty, and presentation of teaching content are dynamically adjusted, thereby realizing precise guidance tailored to individual needs. At the same time, a closed-loop system of "evaluation-feedback-optimization" is constructed, and teaching strategies are dynamically adjusted throughout the process of formative evaluation to ensure the scientific validity and effectiveness of ideological and political guidance.

Efficiency improvement: intelligent feedback strengthens the iterative optimization of leadership capacity. Ideological and political work is essentially human-centered work, which requires timely strategy adjustment according to changes in students' ideological dynamics. Digital intelligence technology provides a dynamic self-evolution mechanism for the continuous improvement of ideological and political leadership by constructing an intelligent feedback closed loop of "whole process data collection-multidimensional analysis-precise diagnosis-dynamic optimization." With the help of natural language processing, sentiment analysis, and other technologies, the trajectory of students' value identification and stages of ideological development can be deeply explored, addressing the traditional difficulty of quantitatively observing ideological states. Targeted interventions are implemented based on accurate diagnostic results. When the system detects that students experience cognitive difficulties or emotional alienation regarding specific theories, it automatically alerts teachers and pushes targeted counseling resources, thus transforming static and lagging assessments into dynamic and timely interventions. At the same time, the roles of teachers and students are reshaped to optimize the teaching

relationship. Teachers shift from knowledge transmitters to learning environment designers and data interpreters, while students shift from passive recipients to active constructors. Through interactive forms such as human-machine dialogue and self-reflection, the teaching process is transformed into a Socratic dialogue in which teachers, students, and intelligent systems collaboratively explore knowledge, thereby significantly deepening students' participation [6].

3. Practical Problems of Mathematical Intelligence Technology Empowering Ideological and Political Leadership in Colleges and Universities

Although digital intelligence technology provides a new possibility for the improvement of ideological and political leadership in colleges and universities, in practice, the integration of the two has not yet reached a deeply coupled state and has exposed a series of outstanding problems, which directly restrict the full effectiveness of ideological and political leadership.

3.1. The Application of Technology Is Superficial, and the Value Rationality Is Impacted

At present, the application of digital intelligence technology in some colleges and universities is still in the stage of "embedding," with a tendency to "emphasize technology and neglect content," which fails to achieve deep integration with the core of ideological and political values. On the one hand, the formalization of technology application is serious. Simply moving offline courses to online platforms or blindly introducing technologies such as VR/AR to create "high-tech scenarios" does not deeply explore the internal relationship between technology and ideological and political content. For example, virtual historical scenes focus only on visual impact and lack the exploration of the spiritual values behind history, which leads students to immerse themselves in sensory stimulation while neglecting deep thinking. On the other hand, algorithmic recommendation leads to the "information cocoon" effect. Personalized recommendations based on students' past behavior data bind students to the "comfort zone" of known preferences, limit exposure to multiple viewpoints and the cultivation of critical thinking, and weaken the theoretical challenge and ideological guidance of ideological and political education. At the same time, the "black-box operation" of algorithms may lead to value-orientation bias. If algorithm design lacks effective ethical review, it may push content that does not conform to mainstream values, which negatively impacts ideological and political guidance.

3.2. Subject Adaptability Is Insufficient, and the Efficiency of Collaborative Education Is Limited

The lack of adaptability of educational subjects is a key bottleneck restricting the deep integration of digital intelligence technology and ideological and political education. This issue is mainly manifested in the dual challenges of teachers' digital intelligence literacy deficit and students' limited subjectivity. Some ideological and political teachers lack the ability to apply digital intelligence technology and are not skilled in operating intelligent teaching platforms and data analysis tools. They find it difficult to creatively integrate technology with teaching content, or even degenerate into mere operators of technical equipment, thereby weakening their dominance and guidance. At the same time, teachers' abilities in digital communication are insufficient, making it difficult to effectively engage with students in the digital space, and reducing the pertinence and appeal of value guidance. For students, the solidification of the "information cocoon" leads to closed thinking. Their ability for independent selection is weakened by algorithms, making it difficult to form independent value judgments. The phenomenon of path dependence on artificial intelligence tools is becoming increasingly common among some students. Many students lack the basic ability to actively explore scientific research topics through literature research, and their creative thinking is obviously insufficient, which prevents

them from effectively controlling AI tools and, in turn, affects the internalization of values [7].

3.3. Risk Prevention and Control System Is Not Perfect, Security Risks Highlighted

The wide application of data intelligence technology has brought multiple risks, such as data security, ethics, and ideology, while the relevant prevention and control systems in colleges and universities are not yet fully developed. In terms of data security, sensitive information such as students' personal data, learning behaviors, and ideological trends faces issues of non-standard collection, unsafe storage, and inappropriate use, placing it at risk of leakage and abuse. In terms of ethics, in addition to the "information cocoon," there are also problems such as algorithmic discrimination and excessive monitoring, which infringe upon students' rights to privacy and independent choice. The more accurate the technology becomes, the more transparent the individual is. However, once this transparency exceeds the boundaries of educational ethics, it may slide into the erosion of students' personal integrity [8]. In terms of ideology, harmful information in cyberspace spreads rapidly through digital channels, impacting the values of college students. However, the monitoring and management mechanisms for network public opinion in colleges and universities are not yet perfect, making it difficult to achieve timely and effective risk prevention and control.

4. Optimization Approach of Digital Intelligence Technology to Empower Ideological and Political Leadership in Colleges and Universities

In view of the practical problems existing in the integration process of digital intelligence technology and ideological and political education, this paper starts from the three dimensions of value orientation, practical path, and mechanism guarantee, which not only strengthens the core position of ideological guidance but also plays the supporting role of technology. At the same time, it improves the supporting guarantee system, promotes the "digital intelligence-ideological and political" from surface embedding to deep integration, and realizes the qualitative and effective leap of ideological and political leading force.

4.1. Value Guidance: To Build the Ethical Foundation of the Mutual Construction of Technology and Value

In order to realize the deep integration of digital intelligence technology and ideological and political education, the primary premise is to establish the core principle of "technology as human and value guidance," and to construct the ethical base of mutual construction of technology empowerment and value guidance. It is necessary to clarify the instrumental attributes of digital intelligence technology, adhere to the value core of ideological and political education, ensure that the application of technology always serves the fundamental task of moral education, and resolutely prevent technological alienation and purpose dislocation. A sound ethical review mechanism for technology application should be established, with a review team composed of ideological and political teachers, technical experts, and ethicists, to strictly review the algorithm model, data analysis process, and digital content involving students' ideological guidance, ensuring that it conforms to the socialist school direction and mainstream values. The optimization algorithm should be designed to avoid ethical risks, and the principle of "value orientation priority" should be integrated into personalized recommendations. The push priority of main-melody content, such as Marxist theory and the party's innovation theory, should be appropriately increased, and the "information cocoon" should be broken to ensure the comprehensiveness of students' information acquisition. At the same time, the standards for data collection and use should be clarified, and encryption technology, access control, and other means should be employed to ensure the safety of students' sensitive data.

4.2. Path Innovation: Building a 'Content-Technology-Subject' Collaborative Education Model

The core of promoting deep integration is to innovate the education mode and build a new pattern of collaborative education based on high-quality content, supported by intelligent technology, and with the subjectivity of teachers and students as the key. Adhere to "content is king" to strengthen the core supply, focus on the theme of the times and the needs of students, and develop digital ideological and political content that is both ideological, contemporary, and interesting, such as combining major national strategies and social hot events, creating interactive dramas, digital narratives, and other characteristic content. Build a standardized digital ideological and political resource library, integrate high-quality resources such as red resources, traditional culture, and practical cases, and realize the co-construction and sharing of schools. Deepen technology empowerment to reshape the teaching process, promote the deep application of VR/AR, digital twin, and other technologies in ideological and political teaching, and create a number of immersive teaching quality courses. Optimize the "online + offline" hybrid teaching mode, strengthen knowledge transfer and basic interaction online, focus on in-depth discussion and practical experience offline, and realize the organic combination of technology empowerment and value guidance. Stimulate the initiative of the subject to build a learning community, strengthen the training of teachers' digital intelligence literacy, and enhance the ability of teachers to screen, integrate, and develop high-quality digital teaching resources in massive information, so that they can master the operation logic of intelligent tools and the balance art of educational ethics, and strengthen the core function of value guidance with the help of technology [9]. Encourage students to actively participate in content creation and dissemination, carry out activities such as the "ideological and political micro-video" creation competition and the digital dissemination of red stories, so that students can change from passive recipients to active constructors. Establish a digital teaching team with teacher-student collaboration, participate in teaching design, resource development, and teaching evaluation, and form a benign interaction between teaching and learning.

4.3. Mechanism Guarantee: Improve the Support System of System Coordination

Establishing a sound and systematic support and guarantee system is the key to ensuring the continuous advancement of the deep integration of "mathematical intelligence-ideological and political education." Strengthen the top-level design and collaborative linkage. At the school level, a leading group for the ideological and political construction of mathematics and intelligence under the unified leadership of the party committee should be established to clarify the division of responsibilities of educational administration, student work, information technology center, Marxist college, and other departments, break the information barrier and resource segmentation, and form a joint workforce. Formulate a special plan for the construction of digital intelligence ideological and political education, clarify the development goals, main tasks, and implementation steps, and comprehensively promote the construction of smart classrooms, platform development, resource integration, and other work. Construct a multi-dimensional intelligent evaluation feedback mechanism, integrate multi-source data such as learning behavior, interactive performance, practical results, and ideological dynamics, and establish a multi-dimensional evaluation index system covering knowledge acquisition, ability improvement, and value shaping. AI technology is used to realize the automation and precision of evaluation, generate personalized evaluation reports, and provide a scientific basis for teaching optimization. Establish an instant feedback mechanism, collect students' opinions through in-class micro-surveys, online messages, etc., and form a closed-loop system of "evaluation-feedback-optimization." Strengthen resource input and system guarantee, set up special funds for the construction of mathematical intelligence and ideological and political construction, and ensure the needs of hardware facilities renewal, platform development, resource construction, and teacher training. Break the

dilemma of data barriers, actively promote the integration of educational resources such as schools, families, and society, and form a joint force for educating people in the integrated construction of ideological and political education [10].

5. Conclusion

It is an inevitable trend for the innovative development of ideological and political education in the new era to empower the ideological and political leadership of colleges and universities with digital intelligence technology, and it is also an important measure to implement the fundamental task of cultivating people with morality and promote the construction of a strong education country. In the future, with the continuous iteration of new technologies such as artificial intelligence and the metaverse, the integration of digital intelligence technology and ideological and political education will be more in-depth and systematic, and ideological and political education will realize the fundamental transformation from "technology empowerment" to "ecological reconstruction." Colleges and universities should take the initiative to seize the opportunities of the times, continue to deepen reform and innovation, and constantly improve the quality and level of digital intelligence technology empowerment, so that ideological and political education can truly live up, solidify, and strengthen, and make greater contributions to the cultivation of more new people with firm ideals and beliefs and a strong sense of social responsibility.

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