

Research on Innovative Paths for Ideological and Political Education of Geological Majors Under the Empowerment of Intelligent Media

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Abstract: Against the dual backdrop of educational digital transformation and high-quality development in the geological industry, smart media technology provides a new driving force for the innovation of ideological and political education in universities. Geological majors possess both the characteristics of science and engineering thinking and the need for field practice, and traditional ideological and political education faces challenges such as insufficient specificity and limited spatial and temporal coverage. Based on cutting-edge research results such as the construction of AI counselors in universities and human-machine collaborative education, this paper combines the educational characteristics of geological majors, which are "practice-oriented, patriotic, and dedicated to hard work," and explores the deep integration path of smart media technology and ideological and political education in geological majors from three dimensions: value-guided precision, scenario-based practical education, and the daily life application of ideological and political discourse. By constructing a geological-featured AI ideological and political platform, creating immersive practical education scenarios, and improving the collaborative education guarantee mechanism, this paper achieves the resonance of ideological and political education with professional education, industry needs, and the requirements of the times, providing theoretical support and practical reference for cultivating geological talents with both professional competence and political responsibility.

Keywords: Intelligent Media, Geological Majors, Ideological and Political Education, Education Innovation.

1. Introduction

At the National Conference on Ideological and Political Work in Colleges and Universities, General Secretary Xi Jinping emphasized the need to "utilize new media and technologies to enliven our work and promote the high integration of traditional advantages of ideological and political work with information technology." With the iterative upgrading of technologies such as artificial intelligence and big data, the advent of the intelligent media era has profoundly changed the dissemination patterns and educational logic of ideological and political education in colleges and universities. [1] Geological majors, as core disciplines supporting national resource security, ecological protection, and energy development, require students to not only possess solid professional skills but also have firm ideals and beliefs, deep patriotism, and the spirit of hard work. Currently, ideological and political education in geological majors faces many practical challenges: firstly, the ideological and political elements in professional courses are not deeply explored, and they are not closely integrated with industry scenarios such as geological exploration and resource development; secondly, students spend long periods of time in field practice, which is spatially dispersed, making it difficult for traditional ideological and political education to achieve full-time coverage; thirdly, students of science and engineering tend to be rational and pragmatic, making traditional didactic ideological and political education less attractive. At the same time, practical explorations such as the construction of AI counselors in colleges and universities and the empowerment of precise ideological and political education through digital and intelligent technologies have provided new ideas to address these challenges. The "Chengxue," "Chengsi," and "Chengzhi" AI counselor

systems developed by Shanghai University of Engineering Science, as well as the human-machine collaborative education model established by many universities, demonstrate the unique advantages of intelligent media technology in improving the quality and efficiency of ideological and political education and expanding the field of education. Based on the characteristics of geological professional talent cultivation, this paper systematically integrates existing research results and explores innovative paths for professional ideological and political education empowered by intelligent media technology. The aim is to promote the transformation of ideological and political education from "flooding irrigation" to "precise drip irrigation," extending from the classroom to field practice sites, and shifting from theoretical indoctrination to value resonance, providing an effective solution for cultivating geological talents capable of undertaking the great rejuvenation of the nation [2].

2. The Uniqueness of Ideological and Political Education for Geological Students and Its Alignment with Intelligent Media Empowerment

(1) Core demands of ideological and political education in geological majors: The cultivation of talents in geological majors has always been closely linked to national strategic needs, and their ideological and political education bears distinct industry characteristics and meets the requirements of the times. From the perspective of value guidance, it is necessary to strengthen students' patriotic sentiments of "exploring minerals to serve the country and exploring for the people" and inherit the geological spirit of "three honors" and "four specials"; from the perspective of ability cultivation, it

is necessary to integrate the concept of ecological civilization, awareness of safe production, and spirit of scientific and technological innovation into the entire process of education; from the perspective of practical requirements, it is necessary to adapt to students' decentralized learning characteristics such as field internships and cross-regional research, achieving full spatial and temporal coverage of ideological and political education. [3] These demands determine that ideological and political education in geological majors must break through traditional models and construct a more flexible, precise, and concrete education system.

(2) The inherent compatibility between intelligent media technology and professional ideological and political education the core advantages of intelligent media technology naturally align with the needs of ideological and political education in geological majors. Firstly, the data integration capability addresses the challenge of precise education. By constructing digital portraits of students and integrating multi-dimensional data such as professional learning, practical performance, and ideological trends, it is possible to accurately identify the ideological and political needs of students of different grades and professional directions, enabling personalized content supply. Secondly, the spatiotemporal expansion characteristic adapts to field practice scenarios. With the help of mobile terminals, satellite communications, and other technologies, ideological and political education can be extended to field exploration sites, addressing the gap in ideological and political education during practical periods through online learning, real-time interaction, and other methods. Thirdly, multimodal expression enhances the attractiveness of ideological and political education. By utilizing VR/AR, short videos, virtual simulation, and other technologies, advanced models, major projects, and red resources in the geological industry can be transformed into immersive ideological and political content, fitting the cognitive characteristics of engineering and science students. Fourthly, the collaborative and efficient characteristic reduces the burden on educators. AI counselors can undertake repetitive tasks such as policy consultation and transaction processing, allowing professional teachers and counselors to focus on core tasks such as value guidance and emotional communication.

(3) The reference value of existing research findings. The existing research on the construction of AI counselors in universities and the precise ideological and political education empowered by digital intelligence has laid a solid foundation for the innovation of ideological and political education in geological majors. The core tasks of "personalized image customization, fine data governance, and deep model training" proposed by Li Diao for AI counselors provide a technical path for the construction of a professional and characteristic ideological and political education platform; the "benchmark for the integration efficiency of university counselors and AI" constructed by Wen Juan provides a scientific framework for evaluating the effectiveness of ideological and political education; and the multi-role AI counselor practice at Shanghai University of Engineering Science has demonstrated the feasibility of providing ideological and political education services based on different scenarios and functions. These achievements indicate that the empowerment of ideological and political education by intelligent media has formed a mature technical framework and practical paradigm, which is suitable for extension and application to geological majors.

3. The Practical Dilemmas of Ideological and Political Education in Geological Majors and The Breakthrough Points Enabled by Intelligent Media

(1) The main bottlenecks of ideological and political education in geological majors at present. The survey found that there are still many urgent issues to be addressed in the ideological and political education of geological majors. Firstly, the integration depth is insufficient. There is a phenomenon of "two skins" between ideological and political education and professional courses, which often remains at the level of slogan integration and fails to organically combine with professional scenarios such as geological exploration and resource evaluation. Secondly, the coverage range is limited. [4] During field internships, students are scattered in remote areas, making it difficult to implement traditional classroom ideological and political education, theme class meetings, and other forms, forming a "blind spot" in ideological and political education. Thirdly, the content lacks appeal. It is mainly focused on theoretical lectures and policy interpretations, lacking concrete expressions combined with cases from the geological industry, making it difficult to resonate with science and engineering students. Fourthly, the evaluation mechanism is single. Qualitative evaluation methods are mostly adopted, making it difficult to accurately measure the actual impact of ideological and political education on students' thoughts and behaviors. Fifthly, the teaching staff lacks competence. Professional teachers lack professional knowledge in ideological and political education, and counselors have limited understanding of the geological industry, resulting in poor collaborative education effects.

(2) The key breakthrough point for smart media technology to overcome the dilemma. In response to the aforementioned dilemma, smart media technology can achieve breakthroughs from multiple dimensions. In terms of content supply, by constructing a geological industry ideological and political education resource library, integrating characteristic content such as major geological engineering cases, industry model worker stories, and red exploration sites, deep integration of ideological and political education with professional knowledge can be achieved. In terms of dissemination channels, a mobile and lightweight ideological and political education platform is created, supporting offline downloads and satellite transmission, ensuring educational coverage during field practice. In terms of presentation formats, VR virtual simulation courses are developed to recreate field exploration scenes, geological disaster prevention and control sites, etc., enhancing the immersion of ideological and political education. In terms of evaluation system, big data analysis is utilized to analyze students' behavioral performance in learning and practice, constructing a multi-dimensional and dynamic ideological and political education evaluation model. In terms of teacher collaboration, AI counselors provide support such as professional ideological and political education material libraries and communication script guides, enhancing the ability of professional teachers to educate students in ideology and politics [5].

4. Innovative Paths for Ideological and Political Education in Geological Specialties Empowered by Intelligent Media

(1) Build a geological characteristic AI ideological and political platform to achieve precise value guidance. Drawing on the three-stage path established by AI counselors in universities, namely "general initiation, characteristic integration, and advanced guidance", we aim to create an intelligent ideological and political platform with geological industry characteristics. At the basic level, a unified ideological and political service portal will be established, integrating general functions such as policy consultation, transaction processing, and psychological counseling, to achieve "7×24-hour" online response and address urgent, difficult, anxious, and hopeful issues faced by students during field practice. At the characteristic level, a geological industry-specific resource library will be constructed, including a "geological spirit inheritance" module that documents the patriotic deeds of scientists such as Li Siguang and Huang Jiqing; a "national strategy interpretation" module that explains the connection between policies such as mineral resource security and ecological civilization construction and the geological industry; and a "field practice ideological and political" module that provides information on safety regulations, environmental protection requirements, and guided tours of red education bases during internships. [6] At the advanced level, an intelligent recommendation system will be developed to accurately push personalized content based on students' digital personas, such as pushing breakthrough cases in mineral exploration for students majoring in exploration and pushing typical practices of ecological restoration for students majoring in environmental geology. Platform construction needs to highlight three key points: first, image visualization, using typical geological industry scenarios to design virtual counselor images, incorporating elements such as geological uniforms and exploration tools to enhance professional identity; second, data refinement, establishing a database covering dimensions such as professional learning, field performance, ideological dynamics, and career planning to ensure the accuracy of recommended content; third, intelligent interaction, supporting multimodal interactions such as voice recognition and image recognition to adapt to the needs of complex field environments.

(2) Create immersive practical education scenarios, promote the integration of ideological and political education with practical teaching characteristics of geological majors, and utilize intelligent media technology to build a three-in-one immersive ideological and political education scenario encompassing "classroom-campus-field". In classroom teaching, develop VR virtual simulation courses to allow students to "experience" major geological engineering construction, geological disaster emergency response, and other scenarios. [7] For example, use VR technology to recreate the scene of the Wenchuan earthquake geological disaster rescue, strengthening the sense of responsibility and accountability. In campus culture, build a digital museum of red resources in the geological industry, integrating resources such as geological museums and red exploration sites from all over the country to enable online panoramic roaming. In field practice, develop a mobile ideological and political education assistant with three major functions: First, on-site teaching

function, recommending geological relics and red resources within the internship area through GPS positioning, enabling the simultaneous development of "field exploration + ideological and political education". Second, safety and environmental protection reminder function, pushing real-time safety production norms and ecological protection requirements based on the on-site environment. [8] Third, experience sharing function, supporting students to upload practical insights and typical cases, creating an educational atmosphere of teacher-student interaction and peer learning. Innovate field ideological and political education practice models, carry out activities such as "cloud-based themed party day" online story sharing, invite industry experts and frontline engineers to communicate with field internship students through video connections, sharing work experiences and life insights; use short video platforms to launch the "My Exploration Diary" topic activity, encouraging students to record their ideological and political education insights during field practice, enhancing the sense of participation and dissemination of education.

(3) Build a collaborative education discourse system to promote the integration of ideological and political discourse into daily life. Based on the cognitive characteristics of science and engineering students, a discourse system combining "grand narrative + professional narrative + life narrative" for ideological and political education is established with the help of intelligent media technology. At the grand narrative level, strategic needs such as national resource security and ecological civilization construction are transformed into development opportunities and mission responsibilities for the geological industry. Through data visualization, chart analysis, and other methods, students can intuitively understand the professional value. At the professional narrative level, cases such as advanced models, technological innovation achievements, and major engineering breakthroughs in the geological industry are explored, transforming abstract ideological and political concepts into specific professional practices. For example, the breakthrough case of deep mineral exploration technology in China is used to interpret the spirit of technological innovation, and the deeds of geological workers taking root in border areas are used to interpret the spirit of dedication. At the life narrative level, attention is paid to practical problems in students' growth and development. Through AI counselors, services such as career planning guidance, psychological counseling, and interpersonal communication skills are provided, integrating value guidance into life services. The multimodal expression of ideological and political discourse is strengthened by producing a series of short videos called "Geological Spirit Micro-Classroom" to interpret the spirit of the industry in plain language. Lightweight content such as ideological and political emoticons and popular science comics for the geological industry is developed to enhance dissemination. [9] A discourse creation mechanism involving "industry experts-professional teachers-counselors" is established to ensure that ideological and political content is both in line with mainstream values and close to professional reality and student life.

5. Practical Outlook and Considerations

(1) Expected Practical Effects: Through the empowerment

of intelligent media, ideological and political education in geological majors will achieve three transformations: First, from "passive reception" to "active participation", immersive and personalized ideological and political content will significantly enhance students' willingness to participate; second, from "classroom limitations" to "full-time coverage", the blind spots of ideological and political education during field practice will be completely eliminated; third, from "theoretical indoctrination" to "value resonance", the deep integration of professional characteristics and ideological and political elements will enhance the persuasiveness and appeal of education. Ultimately, a group of geological talents with firm political beliefs, solid professional knowledge, and excellent work style will be cultivated, providing talent support for strategic needs such as national resource security and ecological civilization construction.

(2) Risks to be avoided: In the process of promoting smart media empowerment, we need to be vigilant against three types of risks: First, the risk of technological alienation. We should avoid over-reliance on technological means and neglect face-to-face emotional communication and value guidance, adhering to the principle of "empowerment through technology rather than substitution". Second, the risk of content homogenization. We should prevent copying the general ideological and political platform model and lacking geological industry characteristics, ensuring that content is closely integrated with the profession. Third, the risk of algorithmic bias. We should establish an algorithm audit mechanism to avoid unfair dissemination of ideological and political content due to data bias, and ensure the fairness of education.

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