
Research on the Precision Education Model of Ideological and Political Education in Colleges and Universities Driven by Big Data

Juan Zhang*

Guangdong Technology College, Zhaoqing 526100, Guangdong, China

**Author to whom correspondence should be addressed.*

Copyright: © 2025 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: In the context of the comprehensive promotion of educational digitalization, the traditional “mass irrigation” model of ideological and political education in universities has become unable to adapt to the characteristics of contemporary college students’ diverse thoughts, differentiated needs, and digitalized behaviors. Big data, leveraging its advantages such as full data collection, deep analysis, intelligent matching, and real-time warning, provides core support for the precise transformation of ideological and political education. This paper, based on the fundamental task of fostering virtue and cultivating talents, explains the connotation and value of big data-driven precise education for ideological and political education, systematically analyzes the current practical difficulties of universities in data governance, technology application, team quality, ethical norms, and collaborative mechanisms, and constructs a “precise perception - precise supply - precise guidance - precise evaluation - precise guarantee” five-in-one precise education model. It also proposes feasible and operational implementation paths, providing theoretical references and practical solutions for universities to enhance the targetedness, affinity, and effectiveness of ideological and political education.

Keywords: Big Data; Ideological and Political Education in Universities; Precision Education; Education Model; Educational Digitalization

Online publication: December 1, 2025

1. Introduction

The in-depth implementation of the digital construction of China and the digitalization strategy for education has pushed higher education into a new stage of digital and intelligent transformation. As digital natives, contemporary college students are highly dependent on the online space for their ideological formation, behavioral habits, value identification, and information acquisition. They exhibit distinct characteristics such as individualization, fragmentation, immediacy, and volatility. Traditional ideological and political education relies on an operational model of experience-based judgment, unified teaching, centralized preaching, and post-event management, which has shortcomings such as content homogeneity, monotonous methods, lagging intervention, and ambiguous evaluation. It is difficult to accurately grasp students’ ideological dynamics, effectively respond to their growth needs, and achieve high-quality educational goals.

Big data technology breaks down information barriers and cognitive limitations, enabling the integration and analysis of multi-dimensional data such as students' academic, life, social, psychological, and online behaviors. It transforms latent ideological problems into explicit data features, converts experience-based judgment into scientific decision-making, transforms passive response into proactive warning, and provides the possibility for the transformation of ideological and political education from "experience-driven" to "data-driven", from "group coverage" to "individual precision", and from "static management" to "dynamic education". Currently, domestic universities are conducting explorations of smart ideological and political education and precise ideological and political education, but they are still in the initial stage overall, and generally face practical problems such as data silos, shallow application of technology, insufficient data literacy of teachers, prominent ethical risks, and the lack of collaborative mechanisms. Based on this, this paper focuses on precise education as the core, systematically constructs a new model of ideological and political education driven by big data, and has important theoretical significance and practical value for implementing the fundamental task of fostering virtue and cultivating new era individuals who are responsible for national rejuvenation^[1-2].

2. The Connotation and Era Value of Precision Education in College Ideological and Political Education Driven by Big Data

2.1. Core Connotation

Under the drive of big data, precision education in college ideological and political education is based on the fundamental direction of cultivating virtue and fostering talents, centered on the growth needs of students, and relying on digital technologies such as big data, artificial intelligence, and cloud computing to collect, clean, analyze, model, and apply data from all scenarios and multiple dimensions of students. This enables precise identification, analysis, provision, intervention, evaluation of students' ideological dynamics, behavioral characteristics, psychological states, and development needs, forming a personalized, dynamic, and closed-loop education mechanism, ultimately achieving a high-level matching between the supply of ideological and political education and the growth needs of students, and maximizing educational effectiveness.

2.2. Era Value

First, it can solve the current practical problems of traditional ideological and political education. Big data can break through time and space limitations, experience boundaries, and group differences, accurately capture students' hidden ideological fluctuations, psychological crises, and development confusions, addressing the problems of "not seeing, not knowing, not keeping up, and not covering" in traditional education, promoting the transformation of ideological and political education from a broad approach to a precise one.

Second, it can enhance the targetedness and affinity of ideological and political education. Through student digital profiling, implement differentiated and targeted education, making the educational content closely related to students' majors, interests, and real-life confusions, enhancing the attractiveness, appeal, and acceptance of ideological and political education, truly achieving student-centeredness and silent influence.

Third, it can realize full-cycle and full-process education. Big data can cover the entire cycle of admission adaptation, academic development, social practice, career choice, and psychological growth, forming a complete chain of monitoring at admission, tracking during school life, early warning of problems, support for growth, and evaluation of development, promoting the implementation of all-round, all-process, and all-round education.

Fourth, it can promote the digitalization of ideological and political education and the modernization of governance. By empowering education concepts, teaching methods, management models, and evaluation systems with data, it can systematically transform the level of scientificity, intelligence, and standardization of ideological and political education, helping higher education achieve high-quality development.

3. The realistic challenges of precision education in ideological and political education driven by big data

3.1. The lagging data governance system and prominent data silo phenomenon

The departments such as academic affairs, student affairs, logistics, library, psychological center, and network center within universities are independent of each other, with inconsistent data standards, incompatible interfaces, and the absence of a sharing mechanism. This has resulted in numerous “data chimneys”. Data collection mainly focuses on explicit structured data such as academic performance, attendance, rewards and punishments, while the mining of implicit non-structured data such as online remarks, emotional expression, social preferences, and value orientation is insufficient. The problems of data fragmentation, lagging, and distortion are widespread, making it difficult to form a complete, vivid, and reliable panoramic portrait of students, and thus lacking high-quality data support for precise education.

3.2. The shallow application of technology and insufficient intelligent empowerment

Most universities’ big data applications remain at the basic level of data statistics, visualization display, attendance management, and grade inquiry, lacking in-depth algorithm models such as dynamic ideological assessment, psychological crisis warning, value analysis, and personalized recommendation. Some smart ideological and political platforms have single functions and weak interactivity, failing to deeply integrate with classroom teaching, daily management, practical education, and psychological counseling. There is a formal tendency of “emphasizing platform construction, neglecting practical application” and “emphasizing technical display, neglecting educational laws”, resulting in a significant reduction in the effectiveness of technology empowerment.

3.3. Weak data literacy among ideological and political education staff and insufficient capability adaptation

Most ideological and political education staff and counselors have a background in humanities and social sciences and generally lack the ability to collect, analyze, interpret, and apply data. They cannot effectively utilize data for precise teaching and ideological guidance, nor can they use data tools to conduct risk warnings and classified assistance. Some teachers have a resistant attitude towards digital technology and adhere to traditional models; some teachers fall into technological dependence and neglect the humanistic and emotional nature of ideological and political education. The phenomenon of “two skins” between technology and education hinders the implementation of precise education.

3.4. The prominent risks of data security and ethics, and the incomplete system regulations

The boundaries of data collection are unclear, privacy protection measures are weak, and the information usage rights are not clear. This can easily lead to student privacy leakage and data abuse. The algorithm recommendation mechanism lacks supervision, which can cause students to be trapped in “information cocoons”, solidify cognition, narrow vision, and weaken the effect of mainstream value guidance. At the same time, universities lack specialized data security systems, ethical review mechanisms, and supervision systems, resulting in a lack of supervision over algorithm fairness, data usage, and privacy protection, and weak risk prevention capabilities.

3.5. The absence of a collaborative education mechanism and the lack of guarantee for precise operation

Precision ideological and political education requires cross-departmental, cross-disciplinary, and cross-level collaborative efforts. However, currently, universities generally have insufficient coordination by the Party committee, departmental division, unclear rights and responsibilities, and scattered resources. Data, technology, teachers, and platforms have not formed a synergy. The school-department-class three-level linkage mechanism is not complete, and ideological education courses and course-based ideological education, online education and offline guidance, and school education and family education have not been effectively connected. Precision education lacks long-term institutional guarantees.

4. Building a Precision Education Model for Ideological and Political Education in Universities Driven by Big Data

This paper constructs a five-part, closed-loop running precision education model of “precise perception - precise supply - precise guidance - precise evaluation - precise guarantee”, achieving full-process, scientific and intelligent education^[3].

4.1. Precise Perception: Establish a multi-dimensional dynamic student data profiling system

Precise perception is the prerequisite for precise education. Based on comprehensive data collection from all dimensions, including students’ basic information, academic data, classroom performance, book borrowing, campus consumption, dormitory schedule, online behavior, psychological assessment, social practice, rewards and punishments, etc., through machine learning and cluster analysis, form dynamic portraits of five dimensions: ideological status, learning ability, psychological state, interest preference, and development potential, to achieve in-depth understanding and precise capture of students’ real conditions, providing data basis for precise policies^[4].

4.2. Precise Supply: Build a stratified, classified and personalized ideological and political resources system

Precise supply is the core of precise education. Based on student profiling, implement stratified and classified teaching according to individual needs: push universal content such as Party innovation theories, current affairs hotspots, core values to all students; push differentiated content to different grades, majors, ethnic groups, student cadres, etc., such as promoting craftsmanship spirit among engineering students, focusing on career views among graduates, and providing growth support for struggling students; implement “one person, one policy” for individual students, precisely push micro-lessons, articles, videos, consultations, activities, etc., to directly meet students’ needs.

4.3. Precise Guidance: Establish a real-time, warning and intervention system for ideological and behavioral trends

Precise guidance is the key to precise education. Utilize big data algorithm models to automatically grade and warn for situations such as academic decline, psychological abnormalities, online deviance, interpersonal conflicts, abnormal consumption, and ideological fluctuations. Counselors and ideological and political teachers use the warning information to conduct online communication, offline talks, classified assistance and follow-up guidance, achieving a transformation from “passive handling” to “active discovery” and “pre-intervention”, while combining value guidance, emotional support and behavior correction to enhance the timeliness and effectiveness of guidance.

4.4. Precise Evaluation: Build a data-based, multi-dimensional evaluation system for educational effectiveness

Precise evaluation is the driving force of precise education. Break away from the single examination evaluation model and establish a comprehensive evaluation system that is process-based, development-oriented and data-driven. Through multi-dimensional data such as classroom participation, online interaction, practical performance, ideological trends, daily behavior and growth changes, objectively score students’ ideological and political literacy; at the same time, review the effectiveness of course teaching, theme activities and assistance work, forming a “evaluation - feedback - improvement - enhancement” closed loop, continuously optimizing educational strategies^[5].

4.5. Precise Guarantee: Improve a collaborative, institutional and operational support system

Precise guarantee is the foundation of precise education. Establish a four-level operation mechanism of school-level coordination, departmental collaboration, departmental implementation and class follow-up, and improve data governance systems, privacy protection systems, ethical review systems, technical operation systems, team training systems and assessment and incentive systems, forming an integrated guarantee pattern of technology, system, personnel and resources,

ensuring the stable, long-term and safe operation of the precision education model.

5. Implementation Path for Precision Education in Ideological and Political Education Driven by Big Data

5.1. Strengthen top-level design and build an integrated intelligent ideological and political data platform

Universities should incorporate precise ideological and political education into the overall digital construction plan of the school. They should establish a unified school-level intelligent ideological and political data center, formulate unified data standards, interface specifications, and sharing mechanisms, break down data barriers among various departments, and achieve integration of data collection, cleaning, sharing, and application. Establish a complete data management standard, expand the scope of collecting implicit ideological data, strengthen data quality verification and dynamic updates, and build a real, complete, and usable ideological and political data asset library^[6-7].

5.2. Strengthen technological innovation and enhance the application level of intelligent precise education

Increase investment in technological research and platform optimization, develop core functional modules such as dynamic ideological monitoring, psychological crisis warning, personalized resource push, intelligent interactive guidance, and education effect analysis. Promote the deep integration of AI, virtual simulation, and media convergence technologies with ideological and political education, and create immersive, interactive, and experiential precise education scenarios. Adhere to technical services for education, strengthen value guidance, avoid technology alienation and formalism, and ensure that technology application always focuses on the cultivation of virtue and the education of people.

5.3. Enhance team literacy and build a professional and digital ideological and political team

Establish a hierarchical and classified, regular data literacy training system, conduct practical training on data knowledge, analysis tools, application scenarios, and ethical norms, and enhance the data awareness, data thinking, and data application capabilities of ideological and political teachers, enabling them to understand data, use data, and carry out precise education based on data. Form interdisciplinary research teams across departments such as the School of Marxism, School of Information, and School of Psychology, promote the deep integration of technology and education, and enhance the professional level of precise education.

5.4. Improve institutional norms and build a defense line against data security and ethical risks

Formulate the “Campus Data Usage Management Measures” and “Ethical Review Specifications for Ideological and Political Data”, clearly define data collection boundaries, usage rights, privacy protection requirements, and accountability mechanisms. Establish a data ethics review committee to conduct full-process supervision of algorithm models, data projects, and education measures, prevent risks such as privacy leakage, algorithm discrimination, and information cocoons. Strengthen education on data security and privacy protection for teachers and students, and enhance their awareness and ability to prevent risks^[8].

5.5. Deepen collaborative education and build a comprehensive education framework for all, throughout, and in all directions

Establish a working mechanism led by the Party committee, with the student affairs department taking the lead, and multiple departments collaborating. Promote the collaboration of ideological and political courses and courses with ideological and political education, the coordination of online education and offline guidance, the collaboration of school education and family education, and the collaboration of teaching and education. Incorporate the effectiveness of precise

education into departmental evaluations and teacher professional title evaluations, stimulate the enthusiasm of all staff, form a collaborative force for education that works in the same direction and jointly exerts efforts, and ensure that precise education is implemented effectively^[9-10].

6. Conclusion

Big data technology has provided a powerful impetus for the innovation and improvement of ideological and political education in universities, promoting a profound transformation of ideological and political education from the traditional extensive model to a more precise, personalized, intelligent, and efficient one. Currently, universities are still facing multiple challenges in the process of promoting precise education, such as lagging data governance, shallow application of technology, insufficient team competence, prominent ethical risks, and inefficient collaborative mechanisms. These must be systematically resolved through concept renewal, model reconstruction, and path optimization.

Building a five-part, closed-loop running model of “precise perception - precise supply - precise guidance - precise evaluation - precise guarantee”, which integrates “precision perception, precise supply, precise guidance, precise evaluation, and precise guarantee”, is an inevitable choice for ideological and political education reform in the era of big data. Universities must always adhere to the fundamental task of cultivating virtue and fostering talents, prioritize students, strengthen humanistic care and value guidance, maintain balance between technology empowerment and educational laws, and avoid data worship and technicism. In the future, we should continuously deepen the integration of big data and ideological and political education, improve institutional mechanisms, innovate methods and approaches, and enhance educational effectiveness, making ideological and political education more warm, more effective, and more dynamic, and providing solid guarantees for cultivating new era individuals who are capable of undertaking the great responsibility of national rejuvenation.

Disclosure statement

The author declares no conflict of interest.

References

- [1] Xi JP, 2020, On the Party’s Propaganda and Ideological Work. Beijing: Central Documents Press.
- [2] Ministry of Education, 2024, Several Opinions on Strengthening the Construction of Ideological and Political Theory Courses in Universities in the New Era.
- [3] Zhang ZX, Li M, Wang H, 2023, Research on the Innovation of Ideological and Political Education in the Era of Big Data. People’s Publishing House, 12: 45-72.
- [4] Wang SY, 2025, The Theoretical Logic and Practical Path of Precise Ideological and Political Education in Universities. Marxism Studies, 32(2): 112-120.
- [5] Liu JJ, 2025, The Value and Path of Data-driven Precise Ideological and Political Education. Ideological and Theoretical Education, 41(4): 89-95.
- [6] Xie XJ, 2025, Construction of Smart Ideological and Political Education Platform and Innovation of Precise Education Model. China Higher Education, 58(6): 67-71.
- [7] Li ZJ, 2025, Research on the Digital Transformation of Ideological and Political Education in Universities. Research on Ideological Education, 29(1): 33-40.
- [8] Li H, 2025, Risk Prevention of Precise Ideological and Political Education in Universities from the Perspective of Data Ethics. School Party Building and Ideological Education, 42(10): 56-61.

- [9] Li JG, 2025, Characteristics of College Students' Ideological and Behavioral Thoughts in the New Era and Precise Guidance Strategies. *Ideological and Theory Education Guide*, 36(3): 78-84.
- [10] Li Y, 2025, Exploration of Precise Practice of Ideological and Political Education in Universities under the Background of Smart Campus. *Higher Education Exploration*, 44(5): 123-129.

Publisher's note

Whoce Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.