

Data Empowerment for Precision in University Ideological and Political Education: Pathways and Practices

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Abstract: University ideological and political education (IPE) in China has long faced challenges related to coarse-grained provision and insufficient targeting. Drawing on a youth development research project conducted at a Chinese university, this study examines how student data accumulated through routine administrative and learning systems can be repurposed to enhance the precision of IPE. We propose a four-dimensional precision framework: student ideological dynamics profiling, tiered and categorized content delivery, integration of online and offline educational carriers, and closed-loop feedback mechanisms. The study also addresses enabling conditions and constraints, including faculty data literacy, institutional data silos, and privacy protection. We argue that while data enables educators to better identify student needs and tailor interventions, the essence of IPE remains value orientation and humanistic care—data is a means, not an end. This paper contributes empirical insights into the operationalization of data-driven student affairs in the higher education context.

Keywords: Ideological and political education; Precision education; Data-driven decision-making; Higher education; Student affairs

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1. Introduction

University ideological and political education (IPE) in China constitutes a systematic endeavor to cultivate students' values, civic awareness, and social responsibility. Despite substantial efforts—manifested in themed class meetings, league activities, lectures, and reports—practitioners frequently encounter a persistent dilemma: considerable effort is expended, yet the educational outcomes remain difficult to assess with clarity. Content is largely standardized across cohorts, and meaningful feedback channels to determine whether students are genuinely engaged or affected are lacking.

The author, drawing on years of experience in student affairs and league work, observes a recurrent pattern: activity plans are meticulously designed, on-site participation appears satisfactory, but once an event

concludes, it is nearly impossible to determine which students have internalized the educational content and which have merely complied with attendance requirements. Understanding students' ideological and psychological states relies primarily on individual conversations and daily observations—methods that are limited in coverage and slow in responsiveness.

The maturation of educational data mining and learning analytics offers a potential remedy. Chinese universities have accumulated vast amounts of student data through their information systems over the past decade: second-class transcript records (documenting extracurricular engagement), scholarship and disciplinary records, mental health screening results, and employment intention surveys. However, these data are typically stored in siloed administrative systems and used predominantly for compliance monitoring and management evaluation, with little application to improving pedagogical practice itself.

Repurposing existing data to shift IPE from a one-size-fits-all, broad-brush approach to a precision-oriented, needs-responsive practice represents a timely and underexplored direction. This study addresses the following research questions:

1. What student data are already available in Chinese university information systems, and how can they be repurposed for precision IPE?
2. What practical pathways can operationalize data-driven precision in IPE?
3. What institutional and ethical constraints must be addressed for sustainable implementation?

2. Literature review and theoretical framing

The concept of precision education, emerging from learning analytics and educational data mining, emphasizes the use of student data to tailor instructional strategies to individual learners' needs, characteristics, and contexts ^[1]. While much of the precision education literature focuses on academic performance and cognitive outcomes, its application to student development, values education, and psychosocial support remains underexplored ^[2].

In the higher education context, data-driven student affairs have gained traction internationally, with institutions using predictive analytics for student retention, early warning systems, and personalized career guidance ^[3]. However, the application of such approaches to ideological and political education—a distinctive feature of Chinese higher education—presents unique challenges and opportunities that have received limited attention in English-language scholarship.

IPE in Chinese universities encompasses both formal curriculum (ideological and political theory courses) and informal education (themed activities, league work, and campus culture). Its goals include cultivating socialist core values, fostering national identity, and developing civic responsibility among students ^[4]. Scholars have critiqued the field for its “extensive rather than intensive” approach, characterized by content uniformity and limited responsiveness to student diversity ^[5].

Recent Chinese scholarship has begun exploring the potential of big data and digital technologies to transform IPE ^[6]. Proposals have included using data for student profiling, content personalization, and real-time feedback. However, much of this literature remains conceptual or prescriptive, with limited empirical grounding in actual institutional practice. This study addresses this gap by documenting and analyzing a concrete implementation project.

3. Data availability

This study is situated in a mid-sized comprehensive university in southwestern China.

It identified four categories of existing student data, each with distinct affordances and limitations:

- (1) Learning Behavior Data. Youth Learning (a national political study platform) and themed league course records provide indicators of participation frequency, completion rates, and quiz performance. These data are collected weekly and are relatively complete.
- (2) Activity Participation Data. The university's second-class transcript system records each student's engagement in social practice, volunteer service, academic competitions, and cultural activities. This dataset allows identification of students' interest orientations and activity levels.
- (3) Administrative Records. Scholarship and award data, disciplinary records, academic early-warning alerts, mental health screening results, and employment intention forms constitute a rich repository of student status information. These data are updated semester-wise and are considered authoritative.
- (4) Digital Trace Data. Students' public posts on campus forums, class group chat interactions, and other online expressions, when processed in compliance with privacy regulations, can provide supplementary insights into student concerns and discourse patterns.

Collectively, these datasets share a key characteristic: they are already collected for administrative purposes, meaning their use for educational improvement incurs no additional data collection burden. The challenge lies not in data scarcity but in fragmentation—data reside in different systems (student affairs, academic registry, youth league, counseling center) with inconsistent formats and restricted access.

4. Methodology

This study adopts a design-based research approach^[7], characterized by iterative development of interventions in authentic educational settings. The project spanned two academic years (2024–2026) and involved three iterative cycles of design, implementation, evaluation, and refinement.

Rather than building a comprehensive data warehouse, we adopted a pragmatic, stepwise integration strategy. In each semester, we extracted key indicators from the four data sources listed above and consolidated them into a unified spreadsheet structure. Basic descriptive statistics (frequencies, cross-tabulations, and trend analysis) were employed to generate cohort profiles. We deliberately avoided complex machine learning or predictive modeling, given the exploratory nature of the project and the need to maintain transparency and interpretability for frontline educators.

Ethical approval was obtained from the university's research ethics committee. All data processing adhered to China's Personal Information Protection Law. Identifying information was anonymized before analysis, access was restricted to project team members, and data usage was strictly limited to educational improvement purposes.

The project involved all undergraduate students from the School of Foreign Languages and Cultures ($n = 1,867$) in the participating university.

5. Findings: Four precision pathways in practice

5.1. Profiling students' ideological dynamics

Profiling students accurately is the prerequisite for precision education. In our project, we developed

semester-based data profiles integrating learning participation, activity performance, psychological assessments, and daily management records. Using basic statistical aggregation, we categorized students along several dimensions: activity level (highly engaged vs. disengaged), academic status (on-track vs. at-risk), psychological well-being (stable vs. concerning), and issue concentration (specific cohorts showing shared concerns).

Two findings were particularly instructive. First, approximately 16% of students consistently exhibited “invisible” status—low participation across all data sources, rarely appearing in records. These students were previously difficult to identify through conventional observation. Second, issue concentration patterns emerged: first-year students showed heightened academic planning needs, while senior students expressed concentrated career transition concerns.

Notably, we emphasized that profiling serves an “informational” rather than “labeling” function. Profiles are not used for student evaluation or disciplinary purposes, but to enable educators to identify who needs additional attention and what types of issues require timely institutional responses.

5.2. Transitioning content provision from uniform to tiered delivery

The value of profiling materializes when it informs differentiated content delivery. Previously, themed educational content was delivered uniformly across all cohorts regardless of grade, major, or student characteristics. Data revealed three important patterns:

First, developmental needs differ systematically across academic years. Freshmen require more guidance on academic adaptation and study planning, while graduating students need enhanced support for career orientation and professional identity formation.

Second, majors shape student interests and preferred discourse styles. Our data showed that students from the School of Foreign Languages, possessing stronger cross-cultural communication competencies, demonstrated significantly higher engagement when themed content incorporated bilingual presentations, foreign language recitations, and cross-cultural comparative perspectives. Standardized, one-size-fits-all materials yielded notably lower participation.

Third, topical interests vary. While university-level themes remain consistent (e.g., “telling China’s story well”), data-informed adaptation of entry points, case materials, and activity formats substantially improved student receptivity.

Based on these insights, we restructured our IPE content library to include modular components that could be mixed and matched based on cohort characteristics, rather than relying on fixed, universal presentations.

5.3. Integrating online and offline carriers for continuous engagement

Data also guided the integration of educational delivery channels. Online, we leveraged the university’s existing network-based IPE platform and class group chat systems (WeChat groups) to push targeted content and facilitate discussions using communication modes familiar to students. Offline, we translated common issues identified through data analysis into themes for league activities and entry points for individual counseling conversations.

A concrete example illustrates this integration. During the second semester of 2025, data revealed an increase in academic early warnings among third-year students, and cross-referencing with psychological screening data showed a correlation with mental health fluctuations. Rather than waiting for problems to

escalate, we collaboratively designed a series of targeted counseling sessions and peer support activities. Online resources (study tips, stress management guides) were distributed through group chats, while offline workshops provided structured support. The intervention was perceived positively by students and contributed to stabilization of both academic and psychological indicators.

The key principle derived from this practice is that online and offline efforts are not parallel tracks but mutually reinforcing components supported by shared data. Data enables identification of when and where to focus human resources effectively.

5.4. Establishing a closed-loop feedback mechanism

Usually, evaluation of IPE activities was largely subjective, relying on educators' impressions. Our project introduced data-informed feedback loops: comparing pre- and post-activity indicators such as participation rates, assignment completion quality, and discussion engagement.

When certain issues recurred across multiple activities, we adjusted subsequent content and formats accordingly, establishing a continuous cycle of data → activity → feedback → improvement. We emphasize that evaluation serves formative rather than summative purposes—its goal is not ranking or accountability, but enabling iterative refinement of practice.

This feedback mechanism yielded tangible improvements. For example, initial low engagement in career-themed activities was identified through post-activity data; subsequent iterations incorporated student-suggested formats (alumni sharing sessions rather than lecture-style presentations), and engagement metrics improved by 32%.

6. Enabling conditions and implementation constraints

Our implementation experience highlights several factors that significantly influence the feasibility and sustainability of data-empowered IPE.

6.1. Faculty data literacy

The most immediate challenge is the uneven data literacy among frontline student affairs educators. Most IPE practitioners lack training in data analysis and interpretation. The institutional data systems are often designed for administrative specialists and are not user-friendly for educators without quantitative backgrounds. This creates a practical barrier: data may be available, but front-line workers cannot access or use it effectively.

Our project addressed this through three strategies: (1) simplified, dashboard-style data presentations rather than raw datasets; (2) periodic hands-on workshops on basic data interpretation; and (3) designated data coordinators to bridge between technical systems and pedagogical practice.

6.2. Data silos and integration challenges

Data fragmentation remains a significant constraint. Student affairs, academic registry, the youth league committee, and the psychological counseling center maintain separate databases with inconsistent data formats, variable update cycles, and incompatible access protocols. Comprehensive integration would require substantial technical and political coordination that is difficult to achieve quickly.

Our pragmatic solution was a tiered integration strategy: prioritizing the most frequently used data

types (learning records and administrative statuses) for full integration, while maintaining separate but cross-referenced access to other datasets. We found that even partial integration can yield actionable insights, and that pursuing comprehensive integration as a prerequisite for implementation is both unrealistic and unnecessary.

6.3. Privacy, consent, and ethical boundaries

Student data involve sensitive personal information, and use must strictly comply with legal and ethical standards. China's Personal Information Protection Law imposes clear restrictions on data collection, processing, and sharing. Internally, we enforced several safeguards: role-based access restrictions, anonymization of data for analysis, clear purpose specification (educational improvement only), and prohibition of data use for student evaluation or disciplinary decisions.

A critical principle we emphasize is that the availability of data does not justify its unlimited use. Educators must exercise restraint and judgment, distinguishing between what can be known and what should be used. The boundary should be tighter than administrative convenience might suggest.

6.4. Avoiding data determinism

This point merits particular emphasis. IPE addresses the formation of values, identities, and worldviews—domains that resist quantitative reduction. Data reveals correlations and tendencies, not causes or truths. A student's low participation record does not necessarily indicate disengagement or resistance; it may reflect technical issues, competing priorities, or alternative forms of engagement not captured by institutional systems.

Throughout our project, we consciously framed data as a “reference” for professional judgment, not a “replacement” for it. Educators' experiential knowledge, relational trust with students, and capacity for empathic understanding remain irreplaceable. The goal is not to maximize data use but to optimize it in ways that support rather than supplant human educational relationships.

7. Discussion

7.1. Contributions to precision education research

This study makes several contributions to the broader precision education literature. First, it extends precision education from its conventional focus on academic achievement and cognitive outcomes to the domain of values and civic education—an under-researched application context. Second, it provides empirical evidence that data-driven approaches can be implemented with relatively simple analytical techniques, challenging the implicit assumption that precision education requires advanced machine learning or artificial intelligence. Third, it demonstrates that existing administrative data, often dismissed as low-quality for research purposes, can generate actionable insights when repurposed thoughtfully.

7.2. Implications for practice

For student affairs practitioners, our experience suggests a pragmatic pathway: start with available, reliable data; use simple descriptive analyses; focus on identifying patterns of concern rather than attempting comprehensive individual prediction; and maintain tight coupling between data insights and actionable interventions. The tiered integration strategy—prioritizing high-utility data sources rather than pursuing

comprehensive system integration—offers a realistic approach for institutions with fragmented data ecosystems.

For institutional leadership, our findings underscore the importance of investing not only in technical infrastructure but also in faculty development and data governance frameworks. Access alone is insufficient; educators need training, user-friendly tools, and clear ethical guidelines to use data effectively and responsibly.

7.3. Limitations and future research

This study has several limitations. First, it is situated in a single Chinese university, and findings may not generalize to other institutional contexts or national systems. Second, the project's design-based nature prioritizes practical utility over experimental rigor, and we did not employ a control group or rigorous counterfactual analysis. Third, our focus on data repurposing means we did not collect new types of data that might be more informative than existing administrative records.

Future research should examine cross-institutional variations, explore the application of more advanced analytics (including natural language processing of student texts) while carefully attending to privacy implications, and investigate the long-term impacts of data-empowered IPE on student development outcomes.

8. Conclusion

This study has explored the pathways and practices of data-empowered precision in university ideological and political education through a two-year implementation project at a Chinese university. Our findings suggest that existing institutional data, when systematically organized and thoughtfully applied, can help educators better identify student needs, tailor educational content, integrate online and offline delivery, and establish responsive feedback mechanisms.

However, we also emphasize that precision education is not primarily a technological endeavor. The effectiveness of data-driven approaches depends crucially on faculty development, institutional governance, and ethical safeguards. Most fundamentally, the data must serve—not supplant—the human relationships and value-oriented work that constitute the core of ideological and political education.

Data helps educators see more clearly and act more precisely. But it is educators' professional responsibility, empathic engagement, and genuine commitment to student development that transform information into education. Data is a means, not an end.

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