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# Research on Practical Dilemmas and Paradigm Construction of AI-Enabled Precise Learning Situation Analysis in Ideological and Political Courses

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**Abstract:** With the in-depth advancement of the national education digitalization strategy in the new era, the deep integration of artificial intelligence (AI) and ideological and political education has become a crucial direction for the teaching innovation of ideological and political courses. Traditional ideological and political teaching suffers from delayed feedback, one-sided analysis, passive adjustment, and insufficient precision in education, which restrict the effectiveness of fostering virtue and morality. This paper systematically examines the theoretical logic, current research landscape, and practical dilemmas associated with AI-enabled ideological and political teaching. It identifies key challenges including data fragmentation, algorithmic bias, and the lack of standardized evaluation frameworks that hinder the effective deployment of intelligent technologies in educational contexts. To address these issues, this study constructs a closed-loop application paradigm comprising four interconnected stages: intelligent collection, precise analysis, dynamic feedback, and iterative optimization. The proposed paradigm leverages machine learning algorithms, natural language processing, and educational data mining techniques to enable real-time monitoring and adaptive adjustment of teaching strategies. Furthermore, this paper discusses the ethical considerations and governance mechanisms necessary to ensure the responsible application of AI in ideological and political education. The findings provide a theoretical foundation and practical reference for enhancing the precision, effectiveness, and scientific rigor of ideological and political course instruction in the digital era, contributing to the broader goal of modernizing educational methodologies through intelligent technologies.

**Keywords:** artificial intelligence; ideological education; learning analytics; teaching innovation; feedback mechanism

Received: 07 June 2026
Revised: 14 July 2026
Accepted: 27 July 2026
Published: 30 July 2026



## 1. Introduction

Artificial intelligence is undergoing rapid advancement and increasingly permeating diverse domains of human society, including economic production, scientific research, healthcare, and public services. Its evolving capabilities present both unprecedented opportunities and complex challenges for social development, ethical governance, and educational practice. A balanced, forward-looking, and evidence-informed perspective is essential to understand AI's trajectory and its multifaceted implications. It is imperative to foster a constructive relationship between human cognitive capacities and machine intelligence—ensuring that AI systems remain transparent, accountable, and aligned with broadly shared societal values [1]. Rather than replacing human judgment or agency, AI should function as an augmentative tool that enhances decision-making, expands access to knowledge, and supports inclusive, equitable, and lifelong learning pathways. This requires rigorous interdisciplinary inquiry into AI's epistemological foundations, operational limitations, and contextual dependencies, particularly in domains where value-laden judgments and normative reasoning are central.

Policy frameworks at the national level have progressively emphasized the integration of intelligent technologies into education infrastructure and pedagogical innovation. Regulatory instruments introduced in recent years aim to standardize the development and deployment of generative AI systems, with particular attention to data governance, computational resource optimization, and platform interoperability. These measures support the establishment of foundational digital assets—including large-scale, domain-specific training datasets, secure and scalable computing environments, and federated data-sharing protocols—that collectively strengthen the technical readiness of educational institutions. Concurrently, strategic planning documents outline a comprehensive vision for national education digitalization, encompassing the construction of centralized educational data repositories, dedicated high-reliability networks for academic communication, and distributed computing infrastructures designed to serve heterogeneous institutional needs [2]. Such initiatives reflect a systemic commitment to leveraging technological progress for pedagogical modernization, while maintaining rigorous quality assurance, accessibility standards, and pedagogical integrity across all levels of formal education.

Empirical evidence indicates a growing adoption of AI tools in classroom instruction, teacher professional development, and student assessment practices. What was once confined to experimental pilots or isolated institutional deployments has evolved into widespread, routine implementation across diverse educational contexts. Within ideological and political education—a discipline grounded in critical reflection, historical analysis, and normative reasoning—AI applications offer novel avenues for personalizing content delivery, simulating complex socio-political scenarios, and facilitating real-time formative feedback. However, effective integration necessitates theoretical grounding that clarifies the ontological status of AI artifacts, distinguishes between instrumental utility and epistemic authority, and foregrounds pedagogical intentionality over technological determinism. A robust feedback mechanism in this domain must therefore be designed not merely to track behavioral metrics or knowledge recall, but to capture qualitative dimensions such as conceptual coherence, argumentative rigor, ethical sensitivity, and reflective depth. Achieving such outcomes demands co-design processes involving educators, learning scientists, and AI developers, alongside continuous evaluation grounded in longitudinal learning analytics and qualitative classroom research [3, 4].

## 2. Theoretical Basis and Core Connotation of AI-Enabled Precise Learning Situation Analysis in Ideological and Political Courses

### *2.1. Theoretical Basis of AI-Enabled Precise Learning Situation Analysis*

#### 2.1.1. Marxist Intelligence Theory: Fundamental Value Guidance

Marxist intelligence theory constitutes the foundational philosophical and value-oriented framework guiding the integration of artificial intelligence into ideological and political education, particularly in the domain of precise learning situation analysis. This theoretical orientation affirms that technological development—including AI systems—must remain firmly anchored in humanistic principles, prioritizing human subjectivity, ethical responsibility, and the holistic advancement of individuals. Within this paradigm, AI is not conceived as an autonomous agent with intrinsic purpose or normative authority; rather, it functions strictly as a pedagogical instrument designed to enhance educational equity, responsiveness, and depth. Its deployment must align with the overarching educational mission of cultivating well-rounded individuals who possess sound moral character, critical thinking capacity, scientific literacy, and social responsibility. Consequently, AI-enabled analytical tools are evaluated not by their algorithmic sophistication alone, but by their capacity to support formative assessment, identify nuanced developmental trajectories, and facilitate timely, context-sensitive pedagogical interventions grounded in educational ethics and developmental psychology.

The theory of all-round human development provides a comprehensive conceptual architecture for structuring AI-supported learning situation analysis, extending far beyond narrow cognitive metrics or summative knowledge verification. It mandates a multidimensional evaluation framework that systematically captures students' evolving epistemic understanding, ideological awareness, value formation processes, affective engagement patterns, interpersonal behaviors, and practical application competencies. Such an integrative approach enables educators to discern subtle interrelationships among cognitive, affective, and conative domains—revealing how shifts in ideological perception may correlate with changes in emotional regulation or collaborative disposition. Furthermore, it supports longitudinal tracking of developmental progress across curricular sequences, allowing for adaptive curriculum design and differentiated instructional strategies. By embedding these dimensions within AI-driven analytics, learning situation analysis becomes inherently aligned with the pedagogical imperatives of whole-person education—emphasizing continuity, coherence, and contextual relevance throughout students' academic journey [2]. This alignment ensures that technological augmentation serves authentic educational ends rather than displacing pedagogical judgment or reducing learners to data points.

2.1.2. Precision Teaching Theory: Core Practical Support

Precision teaching theory emerges from the foundational principle of personalized education, centering on the pedagogical imperative to align instruction with learners' actual cognitive development, affective dispositions, and ideological maturation trajectories. Its core tenet—teaching based on learning and teaching students in accordance with their aptitude—demands dynamic responsiveness to individual differences rather than static, uniform delivery [5]. Historically, educators have relied predominantly on subjective observation, anecdotal feedback, and periodic assessments to gauge student progress; however, such methods lack granularity, temporal continuity, and multidimensional validity. Consequently, they prove insufficient for capturing the nuanced, evolving nature of ideological formation, value internalization, and moral reasoning—processes that unfold gradually across diverse developmental stages and sociocultural contexts. Without systematic, real-time insight into learners' conceptual understanding, emotional engagement, and belief coherence, instructional interventions risk being misaligned, untimely, or overly generalized, thereby undermining both educational efficacy and learner agency.

The convergence of artificial intelligence technologies with precision teaching theory introduces a paradigm shift in educational practice by enabling rigorous, evidence-informed adaptation at scale [6]. Through continuous multimodal data acquisition—including interaction logs, response patterns, discourse analytics, and behavioral metrics—learning systems generate rich, longitudinal datasets reflective of students' ideological positioning, epistemic confidence, and value-based reasoning. Advanced algorithmic frameworks facilitate pattern recognition, predictive modeling, and adaptive scaffolding, transforming inherently qualitative constructs—such as worldview coherence, ethical sensitivity, or civic orientation—into empirically grounded, quantifiable indicators. These indicators support granular diagnostic profiling, enabling educators to identify micro-level learning barriers, trace conceptual evolution over time, and calibrate pedagogical strategies with unprecedented specificity. Moreover, visualization dashboards translate complex analytical outputs into intuitive, actionable insights, fostering collaborative reflection between teachers and learners while preserving pedagogical discretion and ethical oversight. This integration does not replace human judgment but augments it with robust, context-sensitive intelligence—thereby advancing the realization of truly responsive, equitable, and developmentally attuned education.

*2.2. Core Connotation of AI-Enabled Precise Learning Situation Analysis*

2.2.1. Core of Whole-Process Data Collection and Precise Analysis

Contemporary educational intelligence systems leverage advanced computational methodologies—including supervised and unsupervised machine learning algorithms,

distributed big data cluster analysis frameworks, and dynamic user profiling architectures—to systematically acquire, normalize, and refine multi-dimensional learning situation data. This includes behavioral traces from learning management platforms, interaction logs from intelligent tutoring systems, response patterns in formative assessments, and temporal engagement metrics across digital pedagogical environments. Such comprehensive data integration enables high-resolution identification of individual learners' conceptual gaps, procedural misconceptions, and persistent cognitive bottlenecks within foundational disciplinary knowledge domains. Furthermore, natural language processing pipelines—incorporating syntactic parsing, semantic role labeling, and contextual embedding models—are applied to textual artifacts such as reflective journals, discussion forum contributions, and open-ended assessment responses. Coupled with multimodal sentiment analysis techniques that account for lexical valence, discourse structure, and pragmatic markers, these methods facilitate nuanced interpretation of evolving ideological orientations, affective dispositions, and epistemic uncertainties. The resulting analytical outputs support robust student stratification through clustering algorithms informed by both cognitive and metacognitive dimensions, thereby enabling the construction of granular, longitudinal learning situation profiles. These profiles serve as empirically grounded foundations for adaptive instructional design, real-time pedagogical intervention, and curriculum-level differentiation—ensuring alignment between teaching strategies and learners' authentic developmental trajectories while maintaining strict adherence to academic rigor and pedagogical equity.

2.2.2. Dynamic Teaching Feedback Adaptation Mechanism

In contemporary classroom teaching scenarios, intelligent educational systems are capable of conducting comprehensive, real-time analysis of collective learning dynamics as well as individual student performance trajectories. This capability enables educators to dynamically modulate instructional pacing—slowing down for conceptually dense material or accelerating through well-mastered content—while simultaneously refining pedagogical examples to align more closely with learners' cognitive readiness and experiential backgrounds. Furthermore, interaction modalities—including questioning strategies, collaborative task design, and feedback delivery formats—can be iteratively optimized based on continuously updated behavioral and response data. Beyond the synchronous classroom environment, post-class educational support leverages algorithmic profiling to identify knowledge gaps, affective barriers, and metacognitive weaknesses unique to each learner; accordingly, the system delivers curated learning resources—including explanatory multimedia, scaffolded practice exercises, and contextually grounded illustrative cases—as well as developmentally appropriate ideological education materials that reinforce core values through thematic integration rather than didactic imposition. At the macro-level of periodic instructional review, automated analytics synthesize longitudinal engagement metrics, assessment outcomes, and behavioral logs to generate granular learning situation analysis reports. These reports systematically categorize systemic instructional shortcomings, recurrent conceptual misconceptions, and demographic or cohort-specific learning patterns, thereby furnishing teachers with empirically grounded insights to recalibrate curriculum emphasis, redesign lesson sequences, reconfigure assessment rubrics, and experiment with evidence-informed pedagogical innovations—ultimately achieving seamless alignment between evolving learning conditions and responsive teaching interventions [7, 8].

## 3. Practical Dilemmas of AI-Enabled Precise Learning Situation Analysis in Ideological and Political Courses

### *3.1. Insufficient Technical Adaptation and Shortcomings in Analysis Precision*

3.1.1. Imbalance between General Technology and Disciplinary Characteristics of Ideological and Political Courses

The core objective of learning situation analysis in ideological and political courses extends beyond the assessment of factual recall or procedural competence; it centers on understanding students' evolving internal dispositions—including their developing value orientations, emerging political awareness, moral reasoning patterns, and affective responses to normative concepts. These dimensions are inherently subjective, context-dependent, and dynamically shaped through social interaction, pedagogical mediation, and personal reflection—making them resistant to reductionist measurement paradigms. Conventional data-driven approaches, which rely heavily on quantifiable behavioral proxies—such as frequency of classroom participation, response accuracy on standardized items, or duration of digital platform engagement—offer only fragmented and superficial indicators. They lack the semantic depth, contextual sensitivity, and interpretive nuance required to model the layered processes underlying ideological formation. For instance, a student's silence during discussion may reflect thoughtful deliberation, cultural norms around expression, cognitive overload, or genuine uncertainty—yet algorithmic systems often misinterpret such behavior as disengagement or knowledge deficit. Similarly, high scores on declarative assessments do not reliably signal coherent value integration or principled ethical judgment. Without robust multimodal input—including natural language processing of reflective writing, discourse analysis of peer interactions, and longitudinal tracking of attitudinal shifts across diverse scenarios—AI models remain constrained to surface-level correlations rather than causal or developmental insight. Furthermore, the disciplinary specificity of ideological and political education demands methodological alignment with its epistemological foundations: emphasis on dialectical thinking, historical consciousness, and normative reasoning cannot be adequately mirrored by generic machine learning architectures trained on non-educational or decontextualized datasets. This misalignment perpetuates analytical gaps that compromise both pedagogical responsiveness and curriculum refinement.

3.1.2. Inherent Defects and Analysis Deviations in Algorithm Models

Algorithm models serve as the foundational computational infrastructure for intelligent learning situation analysis, enabling automated interpretation of student responses, behavioral patterns, and cognitive engagement. However, contemporary algorithmic systems frequently exhibit structural limitations—including mechanical rigidity, conceptual narrowness, and interpretive bias—that collectively undermine analytical validity and pedagogical reliability. A critical limitation lies in the training data composition: most models are developed using large-scale, generalized educational datasets that prioritize breadth over disciplinary specificity. As a result, they lack sufficient representation of domain-specific linguistic features, rhetorical conventions, and epistemic frameworks characteristic of ideological and political education. This data asymmetry leads to systematic misinterpretations—particularly in parsing nuanced value-laden expressions, reconstructing ideological reasoning pathways, and differentiating between rote memorization and authentic internalization of core concepts. For instance, when analyzing written responses in ideological and political courses, such models often conflate standardized examination answers with genuine ideological cognition, mistaking formulaic compliance for substantive value identification or ethical reflection. Furthermore, these systems struggle to detect subtle shifts in semantic framing, contextual modulation of political terminology, or dialectical progression in students' evolving worldviews [9]. Consequently, diagnostic outputs may inaccurately represent learners' ideological development stages, obscure longitudinal growth trajectories, and generate misleading feedback for instructional intervention. Addressing these deficiencies requires not only enriched, discipline-anchored training corpora but also the integration of multimodal validation signals—including teacher annotations, peer discourse analysis, and longitudinal cohort benchmarking—to enhance contextual fidelity and hermeneutic depth.

*3.2. Disconnection between Theory and Practice and Risk of Deviation in Education Orientation*

3.2.1. Hollow Theoretical Guidance and Prominent Technological Alienation

At present, the implementation of intelligent learning situation analysis in higher education institutions frequently exhibits an imbalanced emphasis on technological infrastructure, prioritizing the deployment of intelligent hardware systems and digital platforms over pedagogical substance. This tendency treats technical functionality as the primary indicator of advancement in ideological and political education, thereby displacing the foundational educational purpose—namely, fostering moral character development, nurturing holistic ideological growth, and cultivating well-rounded socialist builders and successors. Such instrumentalization risks reducing pedagogical judgment to algorithmic outputs, where complex human developmental processes are flattened into quantifiable metrics. Educators may inadvertently cede interpretive authority to automated analytics, diminishing their capacity for contextualized, empathetic, and value-laden guidance. The resulting technocratic orientation undermines the inherently relational, dialogic, and normative nature of ideological education, which requires sustained human engagement, ethical reflection, and adaptive responsiveness to students' evolving psychological and ideological states. Furthermore, overreliance on standardized data models often overlooks qualitative dimensions such as affective resonance, narrative coherence, moral reasoning trajectories, and socio-cultural situatedness—all of which are essential to authentic ideological formation. When learning analytics operate without robust epistemological grounding in educational philosophy and developmental psychology, they risk reinforcing mechanistic assumptions about cognition and identity. Consequently, the integration of intelligent tools must be deliberately calibrated to augment, rather than supplant, the educator's professional judgment, ethical discernment, and pedagogical wisdom. Strategic alignment between technological capabilities and humanistic educational aims is therefore indispensable—not as an afterthought, but as a constitutive principle guiding system design, data interpretation, and instructional decision-making.

3.2.2. Lack of Paradigm System and Fragmented Practical Application

A persistent challenge confronting the integration of intelligent learning environments into higher education lies in the absence of a coherent, widely accepted paradigm system—encompassing clearly articulated conceptual definitions, standardized operational protocols, and empirically grounded application guidelines. This theoretical vacuum directly contributes to highly fragmented, context-specific, and often isolated implementations at the institutional and classroom levels. Rather than reflecting coordinated pedagogical strategy or evidence-informed scalability, many current deployments remain ad hoc experiments, characterized by limited scope, inconsistent methodology, and insufficient alignment with broader curricular objectives [10, 11]. The lack of a robust foundational framework further undermines methodological rigor: practical initiatives frequently proceed without clear theoretical anchoring, resulting in interventions that are neither systematically evaluated nor cumulatively informative. In particular, within ideological and political theory courses—a core component of undergraduate general education—the application of intelligent learning situation analysis remains largely decoupled from authentic teaching practice. Diagnostic tools, adaptive feedback mechanisms, and data-driven instructional adjustments often fail to meaningfully inform lesson planning, student engagement strategies, or assessment design. Consequently, these technologies do not yet fulfill the fundamental pedagogical imperative of precise, differentiated, and responsive education demanded by contemporary educational policy frameworks. Without deliberate investment in interdisciplinary theoretical synthesis, cross-institutional standardization efforts, and longitudinal practice-based research, intelligent learning environments risk remaining peripheral technical add-ons rather than transformative, integrated pedagogical infrastructures.

## 4. Optimization Strategies and Paradigm Construction of AI-Enabled Precise Learning Situation Analysis in Ideological and Political Courses

### *4.1. Optimizing the Technical Adaptation System to Improve the Precision of Learning Situation Analysis*

Constructing a specialized algorithm training sample library for ideological and political courses represents a foundational technical measure to enhance analytical precision [12, 13]. This library must be systematically developed using authentic, pedagogically rich data drawn from university-level ideological and political education practice, including but not limited to discipline-specific academic discourse, student-generated reflections on ideological topics, value-laden responses to classroom stimuli, transcribed classroom dialogue, structured post-class written reflections, and digitally submitted learning journals. Such data diversity ensures robust representation of linguistic registers, cognitive framing patterns, and affective expression modalities unique to this educational domain. Algorithmic models trained on this curated corpus demonstrate significantly improved capacity to differentiate between surface-level, formulaic responses—often shaped by examination expectations—and authentic, internally consistent ideological articulations grounded in personal reflection and critical engagement. This distinction is essential for minimizing interpretive ambiguity, reducing false positives in identifying ideological misalignment, and avoiding overgeneralization from contextually constrained utterances. Furthermore, iterative validation against expert pedagogical judgment and longitudinal tracking of student developmental trajectories strengthens model reliability and contextual sensitivity across varying institutional and regional educational settings.

Integrating heterogeneous learning data streams through advanced big data analytics enables the generation of dynamic, multidimensional learning situation reports tailored to individual students. These streams encompass quantitative metrics such as homework submission timeliness and completion rates, qualitative textual data from online discussion forums and reflective assignments, behavioral traces from learning management system navigation paths, and temporal patterns in engagement with supplementary ideological and political course materials [8, 10]. By applying natural language processing techniques calibrated for domain-specific semantics and employing time-series modeling to detect evolving conceptual coherence or discontinuity, the system identifies not only gaps in factual knowledge acquisition but also subtle shifts in value orientation, reasoning consistency, and ideological self-positioning. This facilitates continuous, non-intrusive monitoring throughout the entire instructional cycle—from pre-class preparation to post-assessment consolidation—thereby eliminating temporal lags inherent in periodic manual assessments and overcoming the narrow scope of snapshot-based evaluations. The resulting intelligence supports timely, evidence-informed pedagogical interventions, promotes differentiated instruction aligned with learners' evolving cognitive and ideological profiles, and contributes to a more responsive, adaptive, and ethically grounded teaching-learning ecosystem.

### *4.2. Adhering to the Core Orientation of Education and Constructing a Scientific Application Paradigm*

Educational practice must consistently uphold the fundamental principle that education serves as the central, irreplaceable core, while technological tools—including artificial intelligence—function strictly in a supportive, instrumental capacity. This orientation necessitates a clear conceptual and operational demarcation between human agency and machine functionality within pedagogical contexts: teachers retain ultimate responsibility for curriculum design, diagnostic interpretation of learning conditions, formative assessment, ethical judgment, and value-based guidance; AI systems, by contrast, operate solely as data-processing aids that enhance efficiency, scalability, and pattern recognition—but never supplant professional pedagogical discretion. The risk of technological determinism—where educational goals are reshaped to fit algorithmic affordances rather than human developmental needs—must be proactively mitigated

through rigorous policy frameworks, teacher training grounded in critical digital literacy, and continuous evaluation of AI deployment against humanistic educational outcomes [13]. In intelligent learning situation analysis, emphasis must shift from technical performance metrics toward holistic learner profiling that integrates cognitive, affective, social, and moral dimensions. Teachers remain the indispensable interpreters of contextual nuance, cultural relevance, and developmental appropriateness—functions no algorithm can authentically replicate. Consequently, AI integration must be governed by pedagogical intentionality, not technological capability; its deployment should always reinforce, rather than displace, the teacher's role as the primary architect of meaning-making, ideological grounding, and character formation in educational settings.

## 5. Conclusion

The core of AI-enabled ideological and political education lies in serving educational objectives through technological integration, enhancing pedagogical precision via robust data analytics, and ensuring sustained impact through systemic paradigm evolution. Looking ahead, the digital transformation of this domain must remain firmly anchored in foundational educational aims—particularly the holistic development of learners' ethical reasoning, critical self-reflection, and civic awareness. It is essential to proactively mitigate risks associated with overreliance on automation, including diminished human agency in pedagogical judgment, reductionist interpretations of complex socio-moral phenomena, and unintended reinforcement of cognitive biases embedded in training data or algorithmic design. To address these challenges, institutions must systematically strengthen technical adaptation frameworks—such as interoperable learning platforms, context-aware recommendation engines, and multimodal assessment tools—that align with evolving curricular goals and learner diversity. Concurrently, ethical governance mechanisms—including transparent data stewardship protocols, participatory co-design processes involving educators and students, and regular algorithmic impact audits—must be institutionalized. Pedagogical innovation should extend beyond tool adoption to encompass reconceptualized roles for instructors as facilitators of meaning-making, learners as active co-constructors of knowledge, and AI systems as responsive scaffolds rather than authoritative sources. Further, deep integration requires advancing capabilities in real-time learning situation analysis—capturing affective, behavioral, and cognitive dimensions—and adaptive instructional orchestration that responds dynamically to emergent needs. These coordinated efforts collectively enhance the fidelity, responsiveness, and inclusivity of ideologically grounded education, thereby supporting the cultivation of ethically grounded, critically engaged, and socially responsible individuals prepared for complex global challenges.

**Funding:** Research on the Current Situation Investigation and Guidance of Chinese College Students' Value Orientation (2021 Annual Youth Fund Project for Humanities and Social Sciences Research of the Ministry of Education of China, Project No.: 21YJC710022)

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