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**"Teacher-AI-Student" Tripartite Collaboration: Reconstruction and  
Empirical Validation of the Teaching Model for Ideological and Political  
Courses in Higher Education**

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## **Abstract**

With the advancement of artificial intelligence (AI), its deep integration into ideological and political theory courses (IPTPCs) in higher education brings not only opportunities for the reconstruction of teaching forms but also such problems as weakened value guidance by teachers, the absence of students' subjectivity, and the superficial application of technology. This paper proposes a "teacher–AI–student" tripartite collaborative analysis framework and constructs a human–AI collaborative teaching model for IPTPCs, featuring precise pre-class diagnosis, in-class value guidance, and personalized post-class feedback. Taking Guizhou Qiannan University of Science and Technology as a case, the model is validated through quasi-experimental research, questionnaire surveys, interviews, and platform data analysis. The findings show that the tripartite collaborative model helps enhance students' classroom participation, learning outcomes, and value identification, and also improves the precision of teachers' instruction. However, its effectiveness depends on teachers' digital literacy, platform adaptability, and ethical norms. This research may serve as a model reference and offer practical implications for the digital transformation of IPTPCs in higher education.

**Keywords:** tripartite collaboration; human–AI collaboration; ideological and political theory courses in higher education; teaching model; empirical testing

## **Introduction**

With the in-depth development of artificial intelligence technology, the educational ecosystem is undergoing profound transformation, and traditional teaching forms, teacher–student relationships, and knowledge supply approaches are all facing reconstruction. In 2025, the State Council issued the Opinions on Deeply Implementing the "AI+" Action (State Council Document No. 11 [2025]), which proposes to "integrate AI into all elements and all processes of education and teaching, innovate new human–AI collaborative teaching models such as

intelligent learning companions and intelligent teachers, shift education from being knowledge-transmission-oriented to competence-enhancement-based, accelerate the realization of individualized instruction at scale, improve educational quality, and promote educational equity." How ideological and political theory courses (IPTPCs) in higher education can achieve teaching model innovation in this context has become an important issue that urgently needs to be addressed.

At present, IPTPC teaching in colleges and universities is ushering in new reform opportunities, and teaching models in the context of AI are becoming increasingly diverse. Most institutions are shifting from the traditional "teacher–student" dyadic model to the "teacher–AI–student" tripartite collaboration. Teaching explorations such as PAD (presentation–assimilation–discussion) classes and flipped classrooms supported by AI are gradually transcending the traditional "teaching–learning" model and moving toward "teacher–machine–student" collaborative practice. In this context, the deep integration of AI with IPTPC teaching not only expands the space for teaching reform but also provides new pathways for reconstructing IPTPC reform in higher education.

### 1.The Reconstruction Logic of Tripartite Collaboration: From "Technology Empowerment" to "Tripartite Collaboration"

There are three structural deficiencies in the introduction of AI technology into the existing IPTPC teaching models in higher education. First, technology application is disconnected from value guidance. Existing studies mostly focus on the application pathways and functional development of AI technology in IPTPCs. For example, Wang Qi (2023) proposed approaches such as big data, virtual reality, and intelligent guided learning; Liu Pu et al. (2023) proposed the methods of intelligent guided learning, intelligent diagnostic learning, intelligent companion

learning, and intelligent assisted learning; and Zhang Fan (2025) proposed technical pathways such as the "learning-profile blueprint–targeted delivery–intelligent control–precise benchmark." These studies have significantly improved teaching efficiency, but they generally exhibit a "technology-centered" tendency, which weakens teachers' role in value guidance and creates tension between technology application and the fundamental mission of IPTPCs—namely, fostering virtue and nurturing people (\*li de shu ren\*).

Second, there is an imbalance between teacher dominance and student subjectivity. Existing studies mostly focus on the dyadic relationships of "teacher–AI" or "AI–student," such as the transformation of blended teaching logic examined by Tao Lei et al. (2022) and the perception–comprehension–decision–execution reasoning mechanism proposed by Wu Xin et al. (2025). However, the systematic construction of the "teacher–AI–student" triadic relationship remains insufficient, and an effective collaborative mechanism is lacking between teachers' dominant role in technology application and students' subjective participation.

Third, online and offline teaching are disconnected. Existing practices mostly superimpose online teaching onto offline teaching rather than deeply integrating the two. Although Jiang Xiaojun et al. (2025) proposed a cognitive upgrading mechanism for human–AI collaboration, a systematic teaching model spanning the pre-class, in-class, and post-class stages has not yet been developed.

The proposal of the tripartite collaboration analytical framework originates from the cross-disciplinary integration and joint support of multiple theories. Marx's theory of the all-round development of human beings emphasizes that education should promote the comprehensive and free development of individuals; the theory of subjectivity and dominance in ideological and political education emphasizes teachers' leading role and students' subject status in IPTPCs;

constructivist learning theory emphasizes learners' active construction in contexts; distributed cognition theory emphasizes that cognitive activities are distributed among people, tools, and the environment; and blended learning theory emphasizes the organic integration of online and offline teaching. Based on these theories, this paper proposes the "teacher–AI–student" tripartite collaboration analytical framework. The core logic of this framework is "teacher-led + AI-assisted + student-as-subject." Teachers serve as value guides, instructional designers, and emotional communicators; AI serves as a tool for learning-condition diagnosis, resource recommendation, interaction support, and assessment support; and students are active learners, co-constructors, and practical experiencers. The core features of tripartite collaboration are: value guidance that is irreplaceable, technology empowerment that is precise and well-calibrated, and subject participation that is authentic and effective. This analytical framework represents a major shift from "technology empowerment" to "tripartite collaboration."

The logical transformation from "technology empowerment" to "tripartite collaboration" involves reconstruction at three levels. First, from a "tool logic" to an "ecological logic." "Technology empowerment" treats AI as a tool for improving teaching efficiency, whereas "tripartite collaboration" treats AI as an organic component of the teaching ecosystem, emphasizing the dynamic interaction and mutual support among teachers, AI, and students. Second, from a "dyadic relationship" to a "triadic relationship." "Technology empowerment" mainly focuses on the dyadic relationships of "teacher–AI" or "AI–student," whereas "tripartite collaboration" brings students into the collaborative framework, forming a triadic interactive structure of "teacher–AI–student." Third, from an "efficiency orientation" to a "value orientation." "Technology empowerment" takes efficiency improvement as its main goal, whereas "tripartite collaboration" takes value guidance as its core, emphasizing that technology

application must serve the fundamental mission of IPTPCs—fostering virtue and nurturing people (\*li de shu ren\*).

The reconstructed tripartite collaboration teaching model for IPTPCs runs through three stages: pre-class, in-class, and post-class. First, the pre-class diagnosis stage: AI diagnosis + teacher design + student preview. AI conducts learning-condition diagnosis and generates a learning-condition report; teachers design teaching objectives and discussion questions based on the report; students complete preview tasks and submit a list of questions. Second, the in-class practice stage: teacher value guidance + AI interactive assistance + student discussion and practice. Teachers lead value guidance and in-depth explanation; AI provides real-time feedback, case recommendation, and interaction support; students engage in case discussion, group debate, and practical presentation. Third, the post-class internalization stage: AI personalized feedback + teacher Q&A + student reflection and extension. AI generates personalized learning reports; teachers provide targeted Q&A and emotional communication; students complete practical assignments and reflective summaries.

The essence of tripartite collaboration is not simple mutual assistance among teachers, AI, and students, but rather—supported by AI technology—the maximization of teachers' value guidance, the optimization of students' learning efficiency, and the most precise effectiveness of AI empowerment, thereby completing a structural reconstruction of the collaborative logic of IPTPC teaching in higher education.

## **II. Verification and Effectiveness of the Tripartite Collaboration Reconstruction: From "Dyadic Integration" to "Triadic Interaction"**

The most important aspect of the shift from "dyadic integration" to "triadic interaction" lies in promoting the deep integration of AI with the entire process of teaching and learning, so as to

realize the organic unity of teachers, AI, and students in teaching interaction. The achievement of this goal places systematic demands on both teaching subjects and the teaching process: at the teacher level, teachers are required to possess proficient capabilities in applying AI technology and a high level of professional competence; at the student level, students' learning interest and participation vitality need to be stimulated; and at the teaching level, it is necessary to achieve the complete progression of classroom teaching segments, the precise alignment of teaching content, and the standardization and institutionalization of the teaching process. "The practice of the human–AI collaborative model lies in deepening the deep integration of intelligent technology into teaching, establishing an efficient collaboration mechanism between teachers, students, and intelligent agents, realizing the complementary advantages of 'human' and 'machine' in educational goals, educational processes, and educational evaluation, and promoting the systematic improvement of teaching quality and educational outcomes."(Wang Fei et al., 2026).

Taking Guizhou Qiannan University of Science and Technology as a case, this paper employs a quasi-experimental research design to verify the effectiveness of the reconstructed tripartite collaboration model and to reflect on its boundaries and conditions. The quasi-experimental design was adopted primarily based on the following considerations: first, IPTPCs in higher education take natural classes as the teaching unit, making it impossible to randomly assign students to different teaching models; second, the study aims to examine the effectiveness of the tripartite collaboration model in authentic teaching contexts, which requires maintaining the naturalness of the teaching process; third, the quasi-experimental design can maximize the internal validity of the research within a controllable scope. Accordingly, the research subjects were drawn from two parallel classes offering the course \*Basic Principles of Marxism\* in the

second semester of the 2025–2026 academic year. The students were from the 2025 cohort and were divided into an experimental group and a control group: the experimental group was Chinese Language and Literature Class 252, and the control group was Chinese Language and Literature Class 251. The experimental class adopted the tripartite collaboration teaching model, while the control class adopted the conventional teaching model. The two classes were basically comparable in terms of class size, disciplinary background, and entrance examination scores.

After a full semester of teaching experiments, this paper systematically analyzed the experimental class and the control class from multiple dimensions. Specifically, the study compared changes in students' classroom participation, value identification, and critical thinking through questionnaire surveys administered to both classes before and after the experiment; it explored experimental-class students' subjective experiences and feelings of participation in the tripartite collaboration model through in-depth interviews with some students; it analyzed students' experimental participation and learning engagement based on behavioral data collected from the teaching platform; and it examined the actual impact of the tripartite collaboration model on students' learning outcomes through final comprehensive examination scores. These multi-dimensional data corroborated one another, providing empirical evidence for evaluating the effectiveness of the tripartite collaboration model.

First, the questionnaire data mainly revolved around three dimensions: classroom participation, value identification, and critical thinking. The classroom participation questionnaire covered three sub-dimensions—behavioral participation, cognitive participation, and affective participation—with 15 items in total; the value identification questionnaire covered three sub-dimensions—theoretical identification, affective identification, and behavioral identification—with 12 items in total; and the critical thinking disposition questionnaire adopted

a mature scale with 20 items in total. The questionnaires were distributed one week before and one week after the experiment, with the experimental class and the control class tested synchronously. A total of 83 questionnaires were distributed and 76 valid questionnaires were returned, yielding an effective response rate of 91.6%.

Second, relying on the Chaoxing Learning Platform (\*Xuexitong\*), platform data were automatically collected by the teaching platform, covering interaction frequency (including posting, replying, asking questions, and answering), learning duration (cumulative online learning time), and task completion (the completion rates of preview tasks, group assignments, and practical tasks). The platform data were exported weekly, and a total of 16 weeks of data were collected during the experimental period, which were used to analyze differences in learning behaviors between the experimental class and the control class.

Meanwhile, interviews were conducted regarding the tripartite collaboration teaching process. The teacher interview revolved around the instructional design, implementation experience, existing problems, and suggestions for improvement of the tripartite collaboration model. The student interviews revolved around learning experiences, feelings of participation, experiences of using AI tools, and changes in value identification.

Finally, grade data were collected. The pre-test was conducted before the experiment using a unified questionnaire to examine students' mastery of the basic knowledge of \*Basic Principles of Marxism\*; the post-test was conducted after the experiment, with a difficulty level comparable to that of the pre-test, to examine students' mastery and depth of understanding of the course content. The pre-test and post-test scores were used to compare and analyze differences in learning outcomes between the experimental class and the control class.

Through the collection and analysis of the data, it was found that, in terms of students' learning outcomes, the tripartite collaboration model demonstrated significant advantages in knowledge mastery, classroom participation, value identification, and critical thinking. Students in the experimental class scored significantly higher than those in the control class on knowledge tests; their frequency of classroom speaking, platform interaction, and learning duration were also significantly better than those of the control class; their scores on the value identification measurement were likewise significantly higher than those of the control class; and they also exhibited stronger critical thinking and practical ability in group collaboration and practical assignments. At the level of teaching, the tripartite collaboration model effectively improved teachers' lesson-preparation efficiency and resource integration ability, enhanced their classroom organization and precise feedback capabilities, and promoted the improvement of their human–AI collaborative teaching competence. These achievements stemmed from the qualitative transformation of the teaching model from "dyadic integration" to "triadic interaction": in the "dyadic integration" stage, the collaboration between teachers and AI was relatively simple, with AI mainly undertaking resource recommendation and assignment grading, and teaching interaction remaining teacher-centered; in the "triadic interaction" stage, teachers, AI, and students formed dynamic interactions, with AI undertaking functions such as learning-condition diagnosis, real-time feedback, and personalized tutoring, teachers focusing on value guidance and emotional communication, and students actively participating in discussion and practice. The three played their respective roles and supported one another, jointly promoting the systematic improvement of teaching quality and educational outcomes.

### **III. Reflection on the Boundaries and Optimization Pathways of Tripartite Collaboration: From "Model Reconstruction" to "Ecological Construction"**

Empirical testing shows that the tripartite collaboration model has significant teaching effectiveness; however, its effectiveness is subject to clear boundary conditions. Combined with the experimental data and interview materials, several key factors constraining the model's effectiveness can be identified and need to be treated with caution.

Teachers' role in value guidance cannot be replaced by AI technology. AI can assist teachers in knowledge transmission, pre-class learning-condition diagnosis, and information integration and analysis, but it can never replace teachers' value guidance for students, spiritual transmission, and responses to their questions and concerns. Since university ideological and political theory courses shoulder the fundamental mission of fostering virtue and nurturing people (\*li de shu ren\*), the most important element is "value guidance," which AI is unable to fulfill. The empirical data show that students in the experimental class reported significantly higher satisfaction with the dimension of "teacher emotional communication" than with the dimension of "AI interaction," indicating that although technology can improve efficiency, it cannot replace warm emotional communication and value dialogue. Therefore, teacher development support should shift from "technical training" to "competence cultivation": strengthen digital literacy training for ideological and political theory teachers and establish interdisciplinary teaching-research communities, so that teachers can not only "know how to use" technology but also "be adept at using" it, achieving the organic unity of value guidance and precise empowering teaching in human–AI collaboration.

The need for student subjectivity and the supervision and guidance within the teaching process are inevitable. The effectiveness of the tripartite collaboration teaching model depends on students' active participation; however, one point that cannot be ignored is that some students perfunctorily cope with teaching tasks through means such as "idling" (leaving the platform

running without real engagement) and "proxy completion" (having others complete tasks on their behalf). Platform data show that approximately 10%–15% of students exhibited low-participation behavior in the post-class stage. This indicates that technology empowerment does not automatically translate into student participation: without a collaborative model that combines task-driven design with process supervision, it may still fall into the predicament of "formal participation." Therefore, student participation incentives should shift from "task-driven" to "subject self-awareness": combine task-driven design with process supervision, attach equal importance to diversified assessment and positive incentives, and strengthen the relevance of learning content to real life, so that students can transform from being "task-oriented" to "subject-oriented" and truly become active learners and co-constructors in human–AI collaboration.

Teachers' professional digital literacy is a key factor. The interviews revealed that teachers with higher digital literacy can more fully leverage the teaching value of AI tools, whereas those with lower digital literacy tend to develop technology dependence or technology anxiety. Differences in teachers' digital literacy—even to the point of directly ignoring the changes brought about by technology—directly affect the actual effectiveness of the tripartite collaboration model and constitute an important constraint on its promotion. Therefore, platform and technology optimization should shift from "tool adaptation" to "ecological integration": improve platform stability, usability, and data security; promote the deep integration of AI tools with existing teaching platforms; realize the interoperability and sharing of learning-condition data, teaching resources, and assessment feedback; enable technology to be truly integrated into the teaching ecosystem rather than bolted onto the teaching process; lower the threshold for

teachers to use technology; and provide inclusive support for teacher groups with large differences in digital literacy.

Ethical norms and institutional safeguards constitute an important part of the tripartite collaboration model. The collection, storage, and use of students' learning data need to be regulated, and the accuracy and ideological security of AI-generated content need to be reviewed. Technology applications lacking ethical norms and institutional safeguards may bring hidden risks such as data privacy leakage and ideological risks. Therefore, the effective operation of tripartite collaboration must be premised on ethical norms and institutional safeguards. Accordingly, ethical norms and institutional safeguards should shift from "technical norms" to an "institutional ecosystem": improve the norms for technology use, protect students' data privacy, establish ethical boundaries for human–AI collaborative teaching, and promote the formation of a "technology–teacher–student–institution" four-in-one teaching ecosystem, so as to provide institutional safeguards for the sustainable development of tripartite collaboration.

Based on the above reflection on boundaries, the further optimization of the tripartite collaboration model requires a shift from "model reconstruction" to "ecological construction," with coordinated efforts across four dimensions: platform, teachers, students, and institutions. Platform and technology optimization should shift from "tool adaptation" to "ecological integration"; teacher development support should shift from "technical training" to "competence cultivation"; student participation incentives should shift from "task-driven" to "subject self-awareness"; and ethical norms and institutional safeguards should shift from "technical norms" to an "institutional ecosystem." The optimization of the four dimensions is not carried out in isolation; rather, they support and co-evolve with one another, jointly constituting the ecological foundation for the sustainable development of tripartite collaboration.

The ultimate goal of tripartite collaboration is not a fixed teaching model, but a dynamic, open, and sustainable teaching ecosystem. Model reconstruction addresses the problem of "structural deficiencies," while ecological construction addresses the problem of "sustainable development." The core features of the teaching ecosystem manifest as openness, dynamism, and symbiosis. Looking to the future, the deepening of tripartite collaboration needs to move from piloting in a single course to coverage across the curriculum, from practice in a single institution to inter-institutional collaboration, and from technology application to theoretical innovation. The ultimate anchor point is that, no matter how technology develops, the fundamental mission of IPTPCs—fostering virtue and nurturing people (\*li de shu ren\*)—cannot change, the core position of teachers' "value guidance" cannot change, and the basic requirement of students' "subject participation" cannot change. The essence of tripartite collaboration is to let technology return to being a tool, teachers return to being guides, and students return to being subjects. Only in this way can human–AI collaboration truly serve the fundamental mission of IPTPCs and achieve the systematic improvement of teaching quality and educational outcomes.

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