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A Systemic Pathway for AI-Enabled Teaching Reform in Economics, Management, and the Humanities

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Abstract

This paper examines the deep application of artificial intelligence (AI) in higher education, focusing on teaching reform across economics, management, and the humanities. To address persistent challenges—namely, the scarcity of replicable cases, the disconnect between theory and practice, slow curriculum renewal, and weak value guidance—we propose a systemic reform pathway. Grounded in human-centered educational theory, the approach integrates competency-oriented curriculum redesign, innovation in project-based teaching, an intelligent closed-loop assessment system, multi-dimensional empirical validation, and phased, system-level governance. Together, these elements support the organic integration of AI and humanistic education. The core objective is to cultivate three key competencies: data literacy, model literacy, and humanistic-legal literacy, while building a modular curriculum system and promoting a shift from teacher-centered instruction to project-based learning that is problem-driven, data-informed, and collaboration-oriented. Ultimately, the framework aims to provide a teaching-reform paradigm that combines theoretical depth with practical value and serves as a model for the intelligent transformation of humanities and social-science education.

Keywords

Artificial Intelligence, Higher Education, Economics and Management, Teaching Reform, Curriculum Reconstruction

1. Introduction

AI technologies—especially the rapid diffusion of generative models—are reshaping the ecology and development trajectory of higher education. Over time, the digitalization of education has progressed from “tool-based” instructional support to “platform-based” resource integration and, more recently, to an “intelligent” stage characterized by recommendation, automated diagnosis, virtual interaction, and learning analytics. This evolution reflects a deepening integration of information technology and pedagogy. China’s Education Power Construction Plan (2024–2035) explicitly calls for accelerating the deep application of AI and other new technologies across educational scenarios to spur innovation in teaching, research, and governance—setting a clear direction, and a higher bar, for curricular reform in universities, particularly within the humanities and social sciences.

In practice, however, economics, management, and other humanities disciplines face several pressing challenges. First, there are relatively few successful and replicable reform cases: most existing studies concentrate on laboratory-based teaching in STEM fields, leaving economics and management without systematic, in-depth AI-empowered practices and accumulated experience. Second, notable gaps persist between classroom theory and real-world application, as traditional curricular structures struggle to align with the competency demands of emerging industries and economic forms—creating discontinuities in talent cultivation. Third, curricular content often lags behind developments at the frontier—such as large models, the data economy, and platform governance—resulting in outdated knowledge structures.

Many studies have explored the feasibility of applying AI to teaching reform, yet findings are often partial and unsystematic, hindering the development of comprehensive theoretical frameworks and practical guidelines. For instance, research on college English has highlighted AI’s role in personalization but paid insufficient attention to ethics (Yuan Bingjie, 2025). Work in pharmacology underscores efficiency gains but lacks concrete cases (Jiao Lei et al., 2025). Ding Shuai, 2025 analyzes AI-empowered ideological and political education from the perspectives of value, dilemmas, and optimization, though the teacher’s evolving role warrants further study. Zhang Yu, 2025 discusses values, challenges, and practical pathways for AI-empowered classroom teaching and advocates data-driven lesson design, yet ethical issues remain under-addressed. Practice-oriented classroom reform research outlines a framework consisting of a classroom research support system, an evidence-based improvement system, and an interactive feedback system (Xu Lin, 2024). Wang Kai's research systematically proposes mechanisms and countermeasures for AI-empowered burden reduction and quality enhancement in classroom teaching. By leveraging intelligent technologies to achieve personalized teaching, precise evaluation, and workload monitoring, their approach enhances educational quality and student development. However, governance plans for technological ethical risks (e.g., loss of humanistic care, data hegemony) remain vague, and the exploration of practical pathways for technology implementation amid regional resource disparities is insufficient(Wang Kai and Wang Jide, 2022).

Overall, the literature points to two converging trends: legacy disciplines are innovating their teaching models via modern technologies, and AI is deeply empowering pedagogical transformation across fields. The former emphasizes diversified methods and competency development but often lacks robust empirical support; the latter stresses personalization and efficiency yet underexplores ethics, teacher role shifts, and technical limitations. Moreover, many studies focus on specific disciplines or isolated links and lack systemic, holistic frameworks; theory–practice gaps remain, with much work confined to conceptual proposals without empirical validation. Common challenges also persist: limited AI literacy and technical capacity among teachers; data security and ethical concerns; misalignment between teaching content and technological progress; and inequities in resources that exacerbate the digital divide.

To address these problems, this paper proposes a systemic pathway. At the macro level, it aligns with national policy and advanced educational theory to strengthen scholarly foundations and legitimize reform. At the meso level, it emphasizes structural curriculum reconstruction and innovative pedagogy to modernize disciplines and update talent-development models. At the micro level, it leverages learning analytics, process-oriented assessment, and cross-disciplinary cases to build a rigorous, verifiable empirical system. The goal is a reform paradigm with academic depth, high operability, and broad applicability to guide the intelligent transformation of humanities and social-science education.

2. Human-Centered Theoretical Foundations and International Comparative Perspectives

The central task in AI-empowered education is to integrate technological advances and efficiency gains with education's intrinsic humanistic values and formative aims—so that they reinforce rather than undermine each other. Learning is not a passive intake of information but an active, context-bound process of construction and internalization grounded in prior experience and cognitive schemata. AI technologies—especially conversational systems, personalized recommendation engines, and real-time intelligent feedback—can create learning environments aligned with a learner's zone of proximal development, thereby strengthening active construction and improving learning efficiency.

In parallel, learning analytics has introduced an "evidence-driven continuous improvement" paradigm for refined, scientific educational development. By systematically collecting, mining, and interpreting large-scale learning-behavior data—for example, online interactions, resource-access patterns, and task-completion efficiency—teachers can monitor individual trajectories and difficulties in real time and provide timely, personalized interventions and precision support.

International experience offers valuable guidance. UNESCO's 2023 recommendations on generative AI for education and research articulate four principles: human-centeredness, equity and accessibility, capacity building, and policy governance. This implies that AI in education must place learners' holistic development, core competencies, and personal growth at the center, rather than pursuing efficiency in knowledge transmission alone. The U.S. Department of Education's 2023 report on AI's future in teaching and learning likewise emphasizes grounding in learning science, strong evidentiary standards, and a persistent focus on equity to avoid widening educational gaps. These orientations highlight the value of rationality and social responsibility of AI in education.

In China, the national strategy to build an "education power," alongside initiatives such as the New Liberal Arts and New Engineering, calls for prudent, orderly, and innovative reform backed by top-level design and institutional safeguards. The state's push to construct an all-process, all-element, and full-chain digital education system provides robust policy support for deep AI integration across higher-education scenarios. At the same time, ethics, data security, and risk prevention must be strengthened to guard against data misuse, algorithmic discrimination, black-box opacity, and the overreach of instrumental rationality. Both educational theory and international comparison, therefore, point toward a clear imperative: AI-driven reform must balance efficiency and equity, instrumental and value rationality, and technological empowerment and humanistic care.

3. Competency-Oriented Deep Curriculum Reconstruction

Within the broader context of the New Liberal Arts, reconstructing curricula in economics/management and the humanities should focus on cultivating three core competencies. First, data literacy: keen awareness, effective collection, compliant cleaning, intuitive visualization, and causal inference and effect identification—foundational for mastering AI tools and big-data platforms. Second, model literacy: beyond understanding supervised, unsupervised, and generative models and their appropriate use, students should critically identify model biases, grasp interpretability, and conduct objective, rigorous evaluation and optimization. Third, humanistic-legal literacy: ethical and compliance awareness encompassing privacy protection, data-security governance, algorithmic transparency and fairness, and legal/ethical norms for AI governance.

Structurally, a modular system of "general education—core courses—advanced tracks" can be developed. At the general-education level, courses such as "Data Thinking and Tool Practice in the Intelligent Era" help students from varied backgrounds build a shared foundation in data thinking and practical skills. At the core level, courses such as "Digital Finance: Innovation and Risk Modeling" and "AI Ethics and Law" employ deep case teaching, scenario simulations, and project-driven learning to reveal the complex interactions among algorithms, data, economic institutions, and social governance in realistic contexts. Electives can be organized into advanced trajectories tailored to learners' interests and professional goals—e.g., public governance and social-good tracks (smart government, policy-analysis ethics, digital-society governance) and industry-application tracks (business intelligence, market forecasting, user-behavior insights, digital marketing).

Experience from language education is instructive: instant speech-recognition feedback and immersive environments improve motivation, pragmatic sensitivity, and transfer. Similar mechanisms can be applied to courses in communication and negotiation within economics and management. AI-enabled dialogue and simulation platforms can provide realistic negotiation scenarios with instant feedback on expression and strategy, helping students adapt in complex international and cross-cultural contexts. Likewise, courses such as Public Administration Communication and Organizational Behavior can leverage AI to simulate the stances, interests, and behaviors of diverse stakeholders (e.g., government officials, corporate managers, community residents), enabling multi-round games, consultations, and strategic adjustments that cultivate strategic thinking, perspective-taking, and effective communication.

4. Project-Based Teaching and an Intelligent Closed-Loop Assessment System

One of AI's greatest contributions is its ability to accelerate the shift from teacher-, textbook-, and lesso-plan-centered instruction to project-based learning (PBL) that is problem-driven, data-informed, and collaboration-oriented. With AI tools, teachers can guide efficient information retrieval, extraction of key evidence, and iterative solution design. In class, realistic tasks drive deep reasoning, debate, and cycles of reflection that require students to apply disciplinary knowledge, data evidence, and institutional rules to justify claims and decisions. After class, AI-driven personalization can deliver targeted resources, extension exercises, and remediation based on individual profiles and classroom performance. Expected outputs include oral presentations, written project reports, and demonstrations of innovative solutions.

Assessment should form an intelligent, formative closed loop: evidence-based diagnosis, precise learner profiling, personalized intervention, and ongoing re-evaluation and feedback. Evidence spans multiple dimensions, including learning-behavior data (attendance patterns, online activity, assignment timeliness), knowledge-mastery maps (intelligent item generation, error-type analysis, conceptual-association depth), quality of practical outputs (project innovation, report rigor and depth), and higher-order dimensions (originality, team contribution, ethical awareness and conduct, academic integrity). AI teaching-management platforms can automate routine tasks such as intelligent test assembly, OCR-assisted grading, preliminary scoring of certain subjective items, and multi-dimensional analysis of exam results (knowledge-point heat maps, cohort common errors, individual error patterns). Diagnostic visualizations can then be provided promptly to teachers and students, reducing repetitive grading, de-emphasizing one-off exams, and promoting a process-oriented evaluation culture with self-and peer-assessment.

AI can also expand the scope and depth of the "second classroom." In practice-oriented courses such as Public Policy Evaluation, students can go beyond campus limits through VR platforms and large-model simulations of senior government experts, corporate leaders, or community representatives for real-time dialogue. They can conduct simulated policy hearings, project roadshows, and public-engagement activities. Such collaborative practice enhances authenticity, social participation, and transfer; it also promotes cross-disciplinary integration and closer university-industry-research collaboration and value co-creation.

5. Empirical Research and a Multidimensional Evidence System

To rigorously validate the proposed pathway, we recommend a mixed evaluation approach that combines embedded quasi-experiments with multi-node replication across teaching scenarios. In core courses such as Principles of Management and Econometrics, establish experimental groups (deep AI empowerment + PBL + learning analytics support) and control groups (traditional instruction with none or only light AI integration) for at least one full term (12–16 weeks). Pre-tests (baseline abilities, knowledge levels, motivation surveys), mid-course measures (process data, classroom observation, mid-term feedback), and post-tests (knowledge mastery, transfer tasks, motivation, and satisfaction) should be combined with full-process, multi-source data collection. By controlling confounds (instructor, core content), researchers can compare group differences in knowledge depth, transfer to complex problem solving, and gains in intrinsic motivation and self-efficacy.

Evaluation indicators should cover four interconnected dimensions: (1) formative performance (average quiz scores, quality and frequency of participation, group-work contribution); (2) transfer performance (application of models and theories to authentic cases, quality and feasibility of innovative solutions); (3) learning investment (login frequency and duration, video-completion rates, forum engagement, assignment timeliness and completeness); and (4) non-cognitive factors (changes in motivation, self-efficacy for self-directed learning, acceptance and trust in AI-assisted teaching, academic integrity). For text-analysis assignments (e.g., case reports, policy memos) and programming tasks (e.g., data acquisition and cleaning, basic modeling), natural-language processing (semantic analysis, topic modeling, sentiment analysis) and code-similarity detection can partially automate grading, improving objectivity and explainability, reducing grading workload, and enhancing consistency and analytical richness.

Cross-disciplinary research provides transferable evidence. In English-as-a-foreign-language instruction, AI-assisted writing tools, instant pronunciation feedback, and immersive VR environments have been shown to enhance motivation, oral fluency, writing accuracy, and transfer in complex contexts. In pharmacology and clinical-skills training, PBL combined with AI-assisted virtual-patient simulations, personalized learning-path recommendations, and intelligent lesson-preparation systems significantly improves clinical reasoning, engagement, and long-term retention. These validated mechanisms can be adapted to economics and management courses—for example, simulating market effects of different platform-economy policy combinations (enterprise behavior, consumer welfare, innovation)—so students can analyze data and better understand the complexity of institutional design and socio-economic outcomes.

6. Systemic Governance and a Phased Implementation Roadmap

Successful AI adoption in education requires institutional arrangements that balance innovation incentives with risk prevention. At the data level, institutions should enforce purpose limitation, classification, and grading, strong access controls, and full-lifecycle auditability to ensure secure, compliant, and transparent handling of data related to students, faculty, and administrators throughout collection, storage, processing, sharing, archiving, and disposal—thus preventing misuse, illicit transactions, and privacy breaches. At the model-governance level, mandatory checklists and certification procedures should cover explainability, bias audits, and adversarial-attack risk assessment to ensure transparency, fairness, and robustness when AI systems inform key decisions (evaluation, resource recommendation, academic or career advising).

With respect to academic norms and integrity, institutions should refine citation standards, require explicit labeling for generative content (text, code, images), and strengthen oversight and sanctions against misconduct (over-reliance, inadequate attribution, direct copying). These steps help avoid "AI dependence," test-centric learning, and the erosion of deep thinking, while safeguarding the centrality of critical inquiry and originality. At the organizational and ecosystem levels, systematic teacher training in AI literacy, shared resource platforms and toolchains, and inter-university innovation networks can mitigate inequities and narrow the digital divide.

7. Conclusion

The proposed pathway seeks to integrate AI technologies deeply into education in the humanities and social sciences—pursuing efficiency while maintaining value leadership, and pairing technological empowerment with humanistic care. The framework provides theoretical guidance and practical levers for innovation in economics and humanities instruction and offers a systematic, transferable approach for AI adoption in other disciplines. Future research should emphasize long-term impact tracking, cross-cultural adaptation, and the optimization of personalized strategies tailored to learner diversity, further advancing the innovative integration of AI with teaching and learning and contributing to the building of an "education power."

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