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AI-Based Innovative Teaching Design for Business Courses

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Abstract: With the development of the digital economy and artificial intelligence (AI), traditional business education faces pressure for transformation. The industry's demand for interdisciplinary business talents with both digital intelligence literacy and practical capabilities is growing rapidly. However, traditional courses suffer from bottlenecks such as outdated knowledge updates, weak practicality, insufficient personalized training, and a single evaluation system, leading to a structural mismatch between talent supply and demand. Focusing on the deep integration of AI and business teaching, this study constructs an AI-enabled closed-loop teaching model of "learning status diagnosis—path planning—teaching implementation—intelligent evaluation—dynamic optimization" based on constructivism and cognitive load theory, and proposes three innovative paths: curriculum content reconstruction, human-machine collaborative teaching, and process-oriented intelligent evaluation. Practical verification shows that this model can effectively solve the pain points of traditional teaching, significantly improve teaching efficiency, help increase the approval rate of students' national innovation and entrepreneurship projects by 50%, and raise the employment matching degree for AI-related positions by 35%. Meanwhile, this study sorts out the potential risks of technology implementation and puts forward targeted coping strategies, providing a replicable and promotable practical path for the digital transformation of business education in the new era.

Keywords: Artificial intelligence; Business education; Curriculum and teaching design; Teaching innovation; Human-machine collaboration; Digital intelligence talent training

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1. Introduction

Against the background of the global scientific and technological revolution and industrial transformation, AI is comprehensively reshaping the logic of business operations, forcing systematic reform in higher business education. Traditional business education, centered on standardized curricula, one-way knowledge instruction, and summative assessment, efficiently cultivated a large number of applied management talents in the industrial era. However, in the digital economy era, corporate talent demand has shifted to advanced capabilities such as data analysis, complex decision-making, and human-machine collaboration, and the

adaptability of the traditional teaching model continues to decline [1]. The "Opinions on Accelerating the Digitalization of Education" issued by nine departments, including the Ministry of Education, have also provided clear policy guidance for the digital transformation of business education.

Existing research has gradually extended from the early application of AI-assisted teaching tools to the reconstruction of teaching models and the reform of the educational ecosystem. Domestic scholars such as Kong Xiangwei and Zhou Zheng have explored the construction of digital intelligence business curricula and talent training frameworks, and international research has verified the role of AI tools in improving the capabilities of business students, but has also pointed out its challenges to traditional teaching [2]. However, deficiencies still exist in current research: first, most focus on macro frameworks or partial reforms of single courses, lacking a systematic integration path for the whole process of teaching design; second, theoretical support is insufficient, failing to reveal the empowerment mechanism based on educational psychology theories, resulting in weak universality of practical models; third, there is a lack of systematic strategies for risk response in technology implementation.

From the perspective of micro teaching design, this study realizes the deep coupling of AI and the whole process of business teaching. Its marginal contributions are: theoretically, integrating constructivism and cognitive load theory to clarify the internal logic of technology-enabled business teaching; practically, constructing a whole-process closed-loop teaching model and verifying its effectiveness through cases, forming a directly promotable teaching design plan; in terms of risk prevention and control, systematically sorting out implementation challenges and proposing three-dimensional optimization strategies to ensure the compliant and efficient progress of reforms.

2. Practical dilemmas of traditional business course teaching

Despite the continuous reform of business education, the traditional teaching system still exposes deep-seated contradictions in the face of rapid industrial upgrading. Surveys show that more than 68% of employers believe there is a significant gap between the digital intelligence skills of fresh graduates and job requirements. The core dilemmas are reflected in four aspects:

First, the mismatch between static curriculum system and dynamic industrial demand. In the digital economy, business knowledge updates grow exponentially, but traditional textbooks have a renewal cycle of 2–3 years, with content lagging behind industrial practice. Emerging formats such as live-streaming e-commerce and private domain traffic can hardly be integrated into teaching in a timely manner, and curriculum barriers hinder interdisciplinary integration, making it difficult for students to adapt to the rapidly changing market [3].

Second, standardized teaching fails to meet personalized needs. Traditional "one-size-fits-all" teaching ignores individual differences among students, and the teacher-student ratio of 1:20 in economics and management majors cannot support personalized tutoring, resulting in polarization of teaching effects: underachievers fall behind and advanced learners lack challenges [4].

Third, weak practical teaching and disconnection between theory and practice. Constrained by resources, universities struggle to provide large-scale real business practice scenarios. Existing cases are mostly static reviews of outdated data, lacking dynamic feedback. Surveys show that more than 70% of financial institutions report that fresh graduates need more than six months of pre-job training to be competent, exposing the shortcomings of practical teaching [5].

Fourth, single and rigid evaluation system. Traditional evaluation relies excessively on final written

examinations, focusing on knowledge memory assessment while ignoring the evaluation of advanced literacy such as innovative thinking and collaboration ability. It cannot track the whole learning process, making it difficult to optimize teaching in reverse, failing to truly reflect students' abilities and distorting the original intention of education [6].

To intuitively compare the differences between the two models, the core dimensions are compared as follows:

Table 1. Comparison between traditional and AI-enabled business teaching models

Comparison Dimension	Traditional Business Teaching Model	AI-Enabled Business Teaching Model
Knowledge Update Speed	Relies on fixed textbooks, 2–3-year update cycle, content lags behind industrial practice, insufficient coverage of cutting-edge formats.	Dynamic knowledge graph updated in real time, synchronized with industry frontiers, policies, and cases; content iterates with the industry.
Teaching Adaptability	Standardized unified teaching, one-size-fits-all mode, ignoring differences in students' foundation and abilities	AI learning status diagnosis + personalized path planning, hierarchical and classified teaching, adapting to different learning situations and paces
Practical Teaching Form	Static and outdated case review, single scenario, no real-time decision feedback	Multimodal virtual simulation scenarios, whole-process practical drills, AI real-time feedback on decision effects
Evaluation System	Final written examination determines performance, focuses on knowledge memory, result-oriented	Multidimensional process-oriented intelligent evaluation, whole-process data tracking, three-dimensional ability portrait
Feedback Efficiency	Manual correction and Q&A, long feedback cycle, limited coverage	AI real-time correction and Q&A, full coverage learning status tracking, zero-delay feedback

3. AI-enabled teaching design framework for business courses

Aiming at the core dilemmas of traditional teaching, based on constructivist learning theory and cognitive load theory, this study constructs an AI-enabled closed-loop teaching model, embedding AI technology into the whole teaching process, breaking the linear teaching mode, and realizing the self-iteration of the teaching system through closed-loop data flow. The model includes five core links: first, intelligent learning status diagnosis, where AI collects multi-dimensional student data to generate learning status portraits and locate knowledge shortcomings; second, personalized path planning, customizing exclusive learning progress and tasks based on portraits; third, immersive teaching implementation, building a ternary mode of "teacher-led + AI-assisted + student-centered" to carry out practical drills and tutoring; fourth, multidimensional intelligent evaluation, collecting whole-process data to generate ability portraits and comprehensively assess literacy; fifth, dynamic teaching optimization, where evaluation data flows back to iterate and optimize teaching plans, forming a virtuous cycle. The core innovations of this framework are reflected in three dimensions.

3.1. Curriculum content reconstruction based on dynamic knowledge graphs

Aiming at the problems of lagging and fragmented content in traditional courses, the curriculum system is reconstructed relying on dynamic knowledge graphs: through natural language processing technology to capture academic literature, industry data, corporate cases and other information, extract knowledge points and build a multi-domain three-dimensional knowledge network, realizing real-time update and dynamic correlation of knowledge points [7]. This not only breaks the limitation of textbook cycles, rapidly integrates cutting-edge formats such as live-streaming e-commerce and quantitative investment into teaching, realizing

content synchronization with the industry, but also breaks curriculum barriers, connects interdisciplinary knowledge, helps students build systematic business cognition, and reduces the cognitive load caused by redundant information. For example, in the "Supply Chain Management" course, the latest developments such as global supply chain fluctuations can be quickly linked to core knowledge points such as risk management and inventory optimization, realizing the seamless connection between theory and practice.

3.2. Human-machine collaborative immersive teaching model

Relying on AI to build a ternary collaborative teaching paradigm of "teacher-led—AI-assisted—student-centered", which conforms to the concept of constructivist learning: teachers transform into teaching designers and process guides, focusing on advanced content design and student thinking guidance; AI undertakes low-level tasks such as intelligent teaching assistants and virtual sparring partners, sharing basic work and reducing the burden on teachers and students [8]. On the one hand, generative AI and virtual simulation technologies are used to create highly realistic immersive business scenarios, where students can carry out practical drills such as negotiations and investment decisions in a risk-free environment. AI provides real-time feedback on decision results and market reactions, helping students actively build business thinking through trial and error, making up for the shortcomings of traditional practical scenarios. On the other hand, AI teaching assistants provide all-weather personalized tutoring, conducting knowledge point reviews for underachievers and pushing advanced cases for advanced learners, truly realizing individualized teaching and improving the learning sense of gain of all students.

3.3. Multidimensional process-oriented intelligent evaluation system

Aiming at the drawbacks of traditional evaluation, a multidimensional and whole-process intelligent evaluation system is constructed: collecting multimodal data such as classroom interaction, simulation decisions, and team collaboration in the whole process of students' learning, generating three-dimensional student ability portraits, fully covering advanced literacy such as knowledge mastery, data analysis, communication and collaboration, and innovative decision-making, replacing single-score evaluation. On the one hand, this system achieves comprehensive and objective evaluation, giving consideration to both learning process and results, avoiding the drawback of "one examination determines performance", and truly reflecting students' comprehensive literacy; on the other hand, evaluation data can be fed back to the front-end teaching links in real time, the algorithm automatically adjusts the difficulty of teaching content, and teachers accurately locate weak links and optimize design, realizing a virtuous cycle of "promoting learning through evaluation and promoting teaching through evaluation".

4. Practical cases and effectiveness analysis

4.1. Single-course reform practice

In the "International Business Negotiation" course, a parallel class control experiment was carried out: the experimental group adopted AI-driven immersive simulation teaching, building a multi-scenario virtual negotiation platform relying on generative AI, where AI played the role of negotiation opponents and adjusted strategies in real time according to students' words. After class, a negotiation ability analysis report was automatically generated for teachers' targeted comments. The results showed that the negotiation skills test scores of the experimental group increased by 28% compared with the control group, cross-cultural

communication ability improved by 34%, and course participation reached 92%, effectively making up for the shortcomings of insufficient practical opportunities and lagging feedback in traditional teaching.

In the "Securities Investment" course, generative AI was introduced to build an intelligent teaching platform, connected to real-time stock market data. AI assisted students in processing massive data and compiling basic quantitative strategies, greatly reducing the technical threshold of quantitative learning. After the reform, the course excellence rate increased from 25% to 42%, the average backtest return rate of quantitative strategies independently developed by students increased by 12%, and students could devote more energy to advanced thinking training such as investment logic and risk control [9].

4.2. Comprehensive reform effectiveness

The integrated reform practice of Chengdu University of Information Technology verified the macro value of this model: focusing on four dimensions of curriculum system, teaching mode, quality assurance, and collaborative education, the university implemented AI-enabled business talent training reform, built an industry-education collaborative platform, connected desensitized business data from more than 30 enterprises, and constructed a teaching resource pool containing more than 2,300 real cases. After two years of practice, the reform achieved remarkable results: the approval rate of students' national innovation and entrepreneurship projects increased by 50%, the employment matching degree of graduates for AI-related positions increased by 35%, and the number of awards in national college student business competitions increased by 60% year-on-year, proving that this model can optimize the overall talent training quality, effectively narrow the gap between talent supply and demand, and has strong promotion value.

5. Implementation challenges and optimization paths

The implementation of AI-enabled teaching still faces multiple challenges that require targeted responses:

5.1. Risks of AI hallucinations and cognitive dependence

Generative AI is prone to hallucinations when dealing with complex quantitative calculations and business decision-making problems. If students rely excessively on AI output, they may be misled by wrong information and even degrade their independent thinking ability. To address this, a "human-machine collaboration and dual-review" mechanism should be established: technically, retrieval-augmented generation (RAG) technology is introduced to build a special knowledge base centered on authoritative textbooks and official data, forcing AI output to rely on authoritative data sources to reduce the probability of hallucinations at the source; in teaching, the principle of "human-in-the-loop" is adhered to, shifting the focus of teaching to cultivating students' critical thinking. Meanwhile, prompt engineering is included in basic teaching to standardize human-machine interaction, making AI a learning aid rather than a substitute.

5.2. Digital literacy gap among teachers

AI teaching puts forward new requirements for teachers' digital capabilities. Teachers need to master AI tool application, data portrait interpretation and other skills to realize role transformation. However, the current digital literacy of teachers is uneven, and some senior teachers have technical resistance and capacity shortcomings, hindering the progress of reform. To address this, universities need to build a systematic empowerment system: implement a "business teacher + AI technical expert" dual-teacher co-preparation

system, and form interdisciplinary lesson preparation teams; build a hierarchical and classified training system to carry out adaptive AI application training for different teachers; improve the incentive mechanism, incorporating digital teaching reform results into performance assessment and professional title evaluation to eliminate transformation concerns and stimulate reform initiative.

5.3. Data security and ethical risks

AI teaching systems need to collect a large amount of student learning data, which poses the risk of privacy leakage. Moreover, if there are training biases in the algorithm, it may lead to ethical problems such as unfair evaluation and recommendation discrimination, affecting teaching fairness. To address this, a whole-process data governance and ethical review mechanism should be established: implement a data classification and grading system, encrypt and anonymize sensitive student information, and strictly limit the scope of data use; establish a regular algorithm audit mechanism to regularly check the fairness of the algorithm and correct biases in a timely manner; clarify students' right to data knowledge and choice, inform students of data usage in advance, and grant students the right to withdraw data authorization, adhering to the bottom line of data security and educational fairness [10].

6. Conclusion and prospect

This study systematically analyzes the four core dilemmas of traditional business teaching, constructs an AI-enabled whole-process closed-loop teaching design framework based on constructivism and cognitive load theory, clarifies three innovative paths of curriculum content reconstruction, human-machine collaborative teaching, and intelligent evaluation, and verifies the effectiveness of the model through practical cases. Research shows that this model can effectively solve the structural mismatch between university talent supply and industrial digital intelligence demand, significantly improve teaching efficiency and talent training quality, providing a feasible path for the digital transformation of business education in the new era.

This study still has certain limitations, such as not carrying out large-sample quantitative empirical analysis. In the future, against the background of the deep integration of AI and industry, the teaching model should also break the boundaries of traditional classrooms and build a new teaching system with technology empowerment and scenario reconstruction, including three core dimensions: digital teaching scenarios, collaborative teaching methods, and intelligent evaluation mechanisms. Follow-up research can further carry out cross-university large-sample empirical research, explore the AI adaptation models of different academic stages and professional courses, and continuously improve the data ethics and teaching quality supervision mechanism, balance technology application and core ability training, and cultivate a new era of interdisciplinary business talents with digital intelligence literacy, practical ability and social responsibility.

Disclosure statement

The author declares no conflict of interest.

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