

Construction and Practice of “Three Integrations” Teaching Mode for Intermediate Financial Accounting Empowered by AI

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Abstract: The competency structure of the accounting profession is changing due to the widespread adoption of artificial intelligence (AI) technology, posing new demands on accounting course teaching in universities. “Intermediate Financial Accounting” is a core course in accounting studies, which faces triple teaching challenges in application-oriented private undergraduate colleges: theoretical abstraction, a disconnect between theory and practice, and insufficient learning motivation. Based on the theories of human-machine collaboration, constructivist situated learning, and precision teaching, this paper constructs a teaching model that integrates “dynamic AI case integration, human-machine collaborative accounting integration, and course intelligent agent question-answering integration.” Before class, AI is used to generate preview scenarios. During class, students’ ability to judge standards is trained through dynamic case discussions and comparisons between human and machine accounting. After class, the course intelligent agent provides continuous question-answering support and feeds back learning data to inform teaching. This model, supported by generative AI tools, offers a replicable and scalable path for the digital and intelligent teaching reform of accounting courses in application-oriented private undergraduate colleges.

Keywords: Intermediate financial accounting; Artificial intelligence; Human-machine collaboration

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1. Introduction

Technologies such as financial sharing, intelligent accounting, and big data analysis have rapidly spread in the field of corporate finance. The focus of financial departments has shifted from “post-event accounting” to “forward-looking decision-making”. Consequently, the requirements for accounting talents have expanded from pure accounting operation skills to include standard judgment ability, data analysis ability, and industry-finance integration thinking. The changes in employment demands objectively require corresponding adjustments in accounting course teaching in universities. Feng Jie and Zhang Juan (2025) pointed out that modern information technology needs to be organically integrated into the teaching of accounting and finance-

related courses to promote innovation in teaching models ^[1]; Gao Li, Du Junjuan, and Li Yang (2026) explored the implementation path of teaching reform in accounting courses in universities from the perspective of digital and intelligent technology empowerment ^[2].

“Intermediate Financial Accounting” occupies a pivotal position in the accounting major curriculum system, bridging the gap between the previous course of Basic Accounting and the subsequent courses of Advanced Financial Accounting and Financial Management. The course content is primarily centered around enterprise accounting standards, featuring dense standard clauses and strong logical progression, and is closely related to practical applications. However, in practical teaching at application-oriented private undergraduate colleges, the difficulties of this course are relatively concentrated: the standards are abstract, and students lack business operation experience, making it difficult to establish a connection between accounting processing rules and real business scenarios; the teaching focuses on explaining legal provisions and textbook exercises so that students can make correct entries, but they struggle to grasp the processing methods when facing real economic transactions; some students have a weak foundation, low classroom participation, and lack support for answering questions after class. Zhang Pingping and Duan Dong (2025) explored the direction of the construction of the “Intermediate Financial Accounting” course in application-oriented undergraduate colleges under the background of digitalization and intelligence ^[3], while Guo Tingting (2025) proposed a path for the reform of financial and accounting courses in private colleges in the AI era ^[4]. However, most existing achievements remain at the level of concept advocacy and framework design, and systematic teaching models that are based on the specific learning conditions of private undergraduate colleges and are highly operable are still lacking.

The rapid advancement of generative artificial intelligence technology has provided new instrumental conditions for overcoming the aforementioned dilemma. Free generative AI tools, represented by Doubao, DeepSeek, Kimi, and others, have already acquired capabilities such as contextual case generation, professional question-answering, and text analysis. Teachers can introduce these tools into classroom teaching without waiting for the construction of school platforms. Based on this judgment, this paper attempts to construct a teaching model integrating “AI dynamic cases, human-machine collaborative accounting, and intelligent course agents for answering questions”, and expounds its theoretical basis, overall framework, and implementation path, providing a reference for the digital and intelligent teaching reform of the “Intermediate Financial Accounting” course in application-oriented private undergraduate colleges.

At the theoretical level, this paper examines the application of generative AI in the teaching of core courses in accounting from the perspective of “human-machine collaboration”, positioning AI as a teaching aid and a learning companion for students, rather than a tool that generates answers for students. This contributes to enriching the theoretical research on the reform of accounting course teaching in the context of digitalization and intelligence. At the practical level, the “three integrations” model is highly operable and can provide a reproducible and scalable reform path for similar institutions.

2. Literature review and theoretical basis

2.1. Current research status

Regarding the teaching reform and AI technology application in the “Intermediate Financial Accounting” course, there have been numerous research findings in academia, which can be broadly summarized into three main themes.

Research on curriculum teaching reform. Researchers explore the path of curriculum reform from different perspectives. Wang Xiaojing and Zhao Lina (2026) discussed the teaching reform of intermediate financial accounting courses in application-oriented universities based on the “dual education” training model ^[5]. Cui Lu (2026) analyzed the transformation direction of curriculum teaching models in the digital environment ^[6]. Jin Xiaocui and Wang Juan (2026) explored the systematic embedding of ideological and political elements in the curriculum and the reconstruction of teaching processes in the context of the era of artificial intelligence ^[7]. These studies provide diverse conceptual frameworks, but they mostly focus on one aspect, such as training models, teaching environments, or the integration of ideological and political education, with limited discussion on the specific application of generative AI tools in classroom teaching.

Research on the application of AI and digital intelligence technology. With the popularization of AI technology, researchers have begun to focus on the specific application of intelligent technology in intermediate financial accounting courses. Qian Furong (2026) explored the application methods of AI agents in course teaching ^[8], and Cui Xiaohui (2025) studied the role of knowledge graphs in the organization and construction of course content ^[9]. These studies have verified the feasibility of integrating intelligent technology into accounting course teaching, but most of them focus on a single technical tool and have not yet formed a teaching model that covers the entire process before, during, and after class.

Research on collaborative classroom construction. Some studies have begun to focus on the collaborative relationship between teachers, students, and intelligent technology: Ou Jie and Wu Haiyan (2026) constructed an AI-driven “teacher-student-machine” collaborative accounting classroom ^[10], while Pan Xiaoting (2026) explored the knowledge graph-driven “teacher-student-machine” ternary collaborative curriculum construction and practice ^[11]. Such research is more forward-looking in concept, but the discussion often remains at the level of classroom form or curriculum construction, with insufficient attention to specific teaching designs under the constraints of learning conditions in private undergraduate colleges.

Upon reviewing existing research, it becomes evident that there is a notable characteristic of “more single-point applications and fewer systematic models, more advocacy of concepts and fewer operational paths”: most studies revolve around a specific technology or a particular teaching segment, with relatively few integrating multiple AI applications into a closed-loop teaching model; most research targets ordinary universities or vocational colleges, and systematic designs based on the educational context of applied private undergraduate institutions are relatively lacking. This is precisely the gap that this paper aims to fill.

2.2. Theoretical foundation

The theory of human-machine collaboration emphasizes that humans and machines should each play to their strengths and complement each other: AI excels in procedural and repetitive information processing, while humans excel in value judgments, situational understanding, and ethical decision-making. In the field of accounting, intelligent systems can efficiently complete procedural tasks such as voucher preparation and data verification, but the substantive judgment of economic transactions, the selection of accounting policies, and the control of professional ethics still need to be carried out by accounting personnel. This theory provides a fundamental standpoint for the design of the “three integrations” model: AI undertakes procedural accounting and information retrieval, while human professional judgment and ethical awareness are irreplaceable. Correspondingly, the goal of teaching reform is not to train students to “use AI”, but to cultivate students’ abilities to judge, verify, and correct errors in a human-machine collaborative environment.

The constructivist theory of situated learning advocates that knowledge is not acquired through one-

way impartation by teachers, but rather formed through learners' active construction activities in real or near-real situations. Real business situations can help learners connect abstract principles and rules with specific economic transactions, thereby understanding the economic essence behind the principles. This theory provides a direct basis for "AI dynamic case integration": using AI to quickly generate miniature business situations that are close to students' life experiences, allowing students to use principles to make judgments and engage in discussions in the situations, and achieving active knowledge construction.

The theory of precision teaching emphasizes relying on student learning data to identify learning difficulties and common errors, and then adjusting teaching strategies to enhance the relevance and effectiveness of teaching. In intermediate financial accounting teaching, students often have concentrated areas of weak knowledge, such as confusion over inventory valuation methods and confusion between the cost method and equity method of long-term equity investments. This theory provides support for the integration of "course intelligent agent question answering": by recording students' question-answering and quiz data, AI is used to cluster and attribute incorrect questions, providing a basis for teachers to implement precision teaching.

3. The connotation and overall framework of the "three integrations" teaching model

3.1. Definition of connotation

The "three integrations" teaching model refers to a teaching organizational approach that systematically integrates AI technology into the entire teaching process of "Intermediate Financial Accounting" in three ways.

The integration of AI dynamic cases refers to replacing or supplementing static teaching cases with AI-generated mini business scenarios in real time, addressing the issues of "theoretical abstraction and lack of context" in course teaching. In the classroom, teachers utilize AI to generate business descriptions that are close to students' life experiences and include abnormal transactions or complex terms, guiding students to make judgments and discussions based on accounting standards.

The integration of human-machine collaborative accounting refers to cultivating students' ability to make criteria judgments through a training process of "student manual accounting - AI accounting - comparing differences - attribution analysis", addressing the issue of "being able to make entries but not able to judge". During training, students first complete accounting processing independently, then use AI tools for accounting, and through comparison, discover differences and analyze reasons, thereby understanding the logic behind accounting processing rather than mechanically memorizing results.

The integration of intelligent tutoring agents into courses refers to providing after-class tutoring services and accumulating learning data through course-specific AI intelligent agents, addressing the issues of "lack of after-class tutoring and unattributed learning problems". Teachers organize course outlines, key points, and typical examples into a knowledge base to construct course-specific intelligent agents. Students can ask questions at any time, and the question records and incorrect answer data are used to inform teaching design.

3.2. Overall framework

The "three integrations" model forms a closed loop around the three stages of "pre-class - in-class - post-class". Before class, teachers utilize AI to generate preview scenarios, allowing students to enter the classroom

with real business problems. During class, teachers sequentially organize dynamic case discussions and human-machine collaborative accounting training, enabling students to deepen their understanding of standards through situational judgment and comparison between human and machine. After class, students use the course's intelligent agent to independently answer questions, while teachers cluster error questions and attribute learning situations based on answer records and test data, dynamically adjusting subsequent teaching. In the implementation process, teachers always act as the dominator and reviewer of the model operation. All AI outputs entering the classroom must be reviewed and annotated with standard references by teachers to ensure accurate content and clear boundaries.

3.3. Design principles

The mode design primarily considers four aspects: giving priority to the use of free and easy-to-use generative AI tools, lowering the implementation threshold, and avoiding reforms being shelved due to the lagging construction of school platforms; AI always plays a supporting role, with case generation, classroom organization, and result evaluation being led by teachers, who also bear the responsibility of reviewing AI output, that is, teacher-led; attaching importance to the collection and utilization of learning information such as question-answering records and test data, using data to support teaching decisions, that is, data-driven; and clarifying the capability boundaries of AI, with procedural accounting and information retrieval being undertaken by AI, while professional judgment, accounting ethics, and final decision-making being led by humans, that is, clear boundaries.

4. Teaching implementation path

4.1. AI dynamic case integration

This segment is applicable to chapters with dense standards and high relevance to daily life, such as revenue recognition, inventory accounting, and financial asset measurement. The operation is divided into four steps. First, students propose scenarios, and teachers ask students to present a nearby industry or business scenario on the spot, such as membership recharge at a bubble tea shop, cross-border e-commerce returns, or commission settlement for live streaming sales promotion. Second, AI generates cases. Teachers use AI to generate a mini business description within tens of seconds, including revenue, costs, and several abnormal transactions. Third, the entire class engages in interpretation and discussion. Students judge the accounting treatment methods of various businesses based on the standards, explain their reasons, and question each other. Fourth, teachers provide comments and attribution. They summarize the discussion, annotate the standard basis, and point out common deviations in students' judgments. Compared to traditional case teaching, AI dynamic case generation is faster, the scenarios are closer to students' lives, and classroom participation is significantly higher. After being reviewed by teachers, high-quality cases generated in the classroom can be stored in the course case library to achieve continuous accumulation of case resources.

4.2. Integrating human-machine collaborative accounting

This segment is applicable to content with complex accounting rules and concentrated error-prone points, such as long-term equity investments, income tax accounting, and financial asset reclassification. It is also divided into four steps. The first step involves students independently performing accounting, manually preparing accounting entries based on business information, and explaining the basis for their processing. The second

step involves AI-assisted accounting, where students submit the same business information to an AI tool to obtain the AI's accounting results. The third step involves comparing differences, where students compare the manual results with the AI results item by item to identify the similarities and differences. The fourth step involves attribution analysis, where students analyze the reasons for the differences, such as different choices of depreciation methods, deviations in understanding input-output rules, and differences in timing of revenue recognition, and communicate these insights with the entire class. The goal of this segment is not to "obtain the correct answer," but to train students' professional judgment ability through comparison and attribution, help them understand the logic behind accounting processing, and establish a professional awareness that "AI results must be manually verified." During implementation, it is necessary to prevent students from directly copying AI results. This can be achieved by requiring students to explain their judgment basis and verification process in their assignments.

4.3. Integrating intelligent agent-based question answering into courses

This link is oriented towards autonomous learning after class, and its implementation is divided into three levels. At the knowledge base construction level, teachers organize the course syllabus, key points of each chapter, and typical examples (including answer explanations) into a structured knowledge base, import AI tools, and build a course-specific intelligent agent. At the question-answering service level, students can ask questions to the intelligent agent at any time after class and receive instant answers, making up for the shortage of after-class tutoring resources. At the learning feedback level, teachers regularly export question-answering records, count high-frequency questions, and use AI to cluster and analyze error questions based on test data, identify common knowledge weaknesses, and incorporate them into the focus of subsequent classroom teaching, through the cycle of "question answering - recording - attribution - feedback", after-class tutoring shifts from "students seeking teachers" to "data identifying problems", thus providing data support for teaching decisions.

5. Implementation guarantee and evaluation

5.1. Teacher review and AI boundary management

The content output by AI may exhibit deviations in understanding of standards or contain outdated information. Therefore, it is necessary to establish a review mechanism: all AI-generated cases, accounting results, and question-answering content entering the classroom must be reviewed by teachers and annotated with the basis of standards before use. For content involving accounting professional ethics and ethical judgments, teachers should lead classroom discussions to clarify that AI cannot replace human value judgments. At the same time, students should be made aware of the usage rules that "AI is a learning aid rather than an answer generator," fostering their awareness and ability to critically use AI.

5.2. Principles for tool selection

The selection of tools follows the principle of "availability, ease of use, and low cost": priority is given to free or low-cost generative AI tools to ensure convenient use by both teachers and students; attention is paid to the accuracy and stability of tools in processing Chinese financial texts; data security requirements are considered, and tools and usage methods are carefully selected when involving student information and teaching materials. The selection of tools does not necessarily pursue technological progressiveness, but prioritizes meeting

teaching needs and lowering implementation thresholds.

5.3. Diverse evaluation and continuous improvement

To objectively evaluate the effectiveness of the implementation of the model, multiple evaluation methods can be adopted. At the outcome evaluation level, comparative analysis can be conducted on students' test scores, final grades, and homework quality before and after implementation. At the process evaluation level, records can be kept of students' participation in classroom discussions, frequency of asking questions, and quality of homework completion. At the developmental evaluation level, questionnaires can be used to understand students' acceptance of AI-assisted teaching and learning experience. The evaluation results should be incorporated into teaching improvement: adjusting case difficulty and training frequency based on learning data, optimizing the intelligent agent knowledge base and question-answering strategy based on student feedback, and forming a virtuous cycle of "implementation-evaluation-improvement".

6. Conclusion

The advancement of digital and intelligent transformation necessitates that the teaching reform of the "Intermediate Financial Accounting" course address a fundamental question: it is not whether to introduce AI, but how to make AI serve the realization of accounting talent cultivation goals. The three-in-one teaching model, integrating "dynamic AI cases, human-machine collaborative accounting, and intelligent course agents for answering questions," is supported by human-machine collaboration theory, constructivist situated learning theory, and precision teaching theory. It integrates generative AI into the entire teaching process in a low-cost and operable manner, providing a systematic solution to issues such as theoretical abstraction, the disconnect between theory and practice, and insufficient learning motivation in the teaching of applied private undergraduate courses. This model still needs to be tested in real classrooms, and issues such as teaching effectiveness, student acceptance, and implementation conditions still require further practical research and data verification to be answered. Subsequent research can be conducted based on this model to carry out controlled teaching experiments to test its impact on learning outcomes. It can also be continuously optimized by combining technologies such as knowledge graphs and intelligent evaluation, accumulating more experience for the digital and intelligent teaching reform of accounting and finance courses.

Disclosure statement

The author declares no conflict of interest.

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