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Framework Design and Implementation Pathways for a 5E Model-Based Management Accounting Curriculum Ecosystem

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Abstract: This study addresses critical challenges in Management Accounting education, including the abstract nature of theoretical content, ineffectiveness in ethical cultivation, monotonous teaching methods, simplistic assessment approaches, and the persistent disconnect between theory and practice. Grounded in constructivist theory and the PDCA (Plan-Do-Check-Act) cycle, the research constructs a curriculum ecosystem centered on the 5E Instructional Model. Guided by the student-centered principle, this study designs a systematic instructional pathway to integrate the five phases - Engagement, Exploration, Explanation, Elaboration, and Evaluation - seamlessly into the teaching and learning process. This approach aims to achieve a synergistic unification of knowledge impartation, competency development, and value shaping, thereby providing a valuable theoretical framework and practical paradigm for the ecological construction and high-quality development of business curricula.

Keywords: Management Accounting; 5E Instructional Model; Blended Learning; Moral Education and Talent Development

1. Introduction

With the deepening development of the digital economy, the function of management accounting has expanded from traditional cost accounting to strategic decision support, which places higher demands on talent cultivation. However, current instruction in the Management Accounting course still faces multiple challenges, including a disconnection between theory and practice and insufficient cultivation of students' higher-order thinking skills. Although the promotion of the blended teaching model offers a new pathway for curriculum reform, most existing practices remain at the level of superficial technological integration, lacking a systematic instructional framework that deeply integrates knowledge impartation, skill development, and value guidance.

At the academic research level, blended teaching has evolved from initial model exploration to a deeper focus on instructional effectiveness. Wang et al. (2025)[1] conducted an empirical study covering eight universities and found that in successful blended teaching cases, technology accounted for only 30% of influencing factors, while the scientific design of teaching activities contributed to 70% of the effect difference. This confirms that its success hinges on the scientific design of teaching activities rather than the superficial integration of technological formats. Li (2025)[2] employed a case study that further revealed common characteristics of high-quality blended teaching: achieving knowledge internalization and transfer through a three-stage design of "pre-class basic cognition, in-depth interaction during class, and post-class transfer application," rather than simply digitizing offline content.

The 5E instructional model, as a structured inquiry-based learning cycle, has been thoroughly validated for its effectiveness in STEM education. Yu et al. (2025)[3] conducted an experimental study on engineering mechanics courses that showed that students using the 5E model scored 42% higher on conceptual understanding tests compared to the traditional teaching group, and knowledge retention remained above 75% after three months. Yuan (2024)[4] performed a meta-analysis of 12 STEM education studies and found that the 5E model significantly enhanced students' scientific inquiry ability and problem-solving skills.

In recent years, the model has shown a clear trend of migration to other disciplines. Xie et al. (2024)[5] demonstrated in their application to foreign language teaching that the 5E model improved students' comprehensive language proficiency by 35%, with the most notable

improvement in communicative competence in authentic contexts. Deng (2025)[6] achieved effective stimulation of students' creative thinking by innovatively applying the 5E model in art and design courses through a cyclical process of "design thinking - material exploration - creative expression." Ling (2024)[7] found in a principles of economics course that the model helped students construct a more systematic disciplinary knowledge framework. Applied research in practical fields such as medicine and engineering further demonstrates the universal value of the 5E model. Almashaqbeh et al. (2023)[8] improved students' clinical decision-making accuracy by 28% through using the 5E model for case analysis teaching in clinical medical education. Wang et al. (2025)[9] significantly enhanced students' engineering practical ability by implementing project-based learning through the 5E model in mechanical engineering design courses. Chen et al. (2024)[10] found in a pharmaceutical laboratory course that students using the 5E model showed significant improvements in both experimental design innovation and operational standardization.

However, in business education, particularly in the "Management Accounting" course, existing research has failed to effectively address the disconnect between technology application and teaching philosophy; furthermore, in terms of value guidance, most existing studies remain at the theoretical discussion level, lacking specific pathways for organically integrating ideological and political education into each phase of the 5E model. Therefore, an ecological solution that systematically integrates the 5E model with blended teaching and ideological and political education has yet to be formed, and this research gap urgently needs to be addressed.

Based on this, the present study aims to construct a "Management Accounting" course ecosystem with the 5E instructional model as its core. By integrating constructivist learning theory with the PDCA cycle management concept, it designs a "Blended-5E" teaching framework and systematically plans the implementation pathways for each phase of "Engage, Explore, Explain, Exchange, Evaluate." This initiative seeks to shift the course from knowledge transmission toward competency development and value shaping, thereby providing both a theoretical foundation and a practical paradigm for the ecological development of business courses.

2. Analysis of Teaching Challenges

Based on a systematic survey of accounting, finance, and auditing students enrolled in the "Management Accounting" course, five core teaching challenges have been identified. First, the knowledge system exhibits a significant fragmentation issue. Over 80% of students reported that theoretical content is abstract and dull, with unclear logical connections between different knowledge points. Furthermore, 86% struggled to accurately distinguish the applicable scenarios of various management accounting methods, leading to rote memorization rather than the development of critical analytical skills.

Second, the integration of value guidance with professional knowledge remains superficial. Insufficient depth in exploring and interpreting value-related concepts has prevented them from being effectively internalized as students' intrinsic qualities and ethical mindset, ultimately resulting in a limited educational impact on character development.

Third, the singularity of the teaching model is a prominent issue. Faced with upper-year students whose attention is divided by postgraduate entrance exams and job hunting, traditional lecture-based teaching fails to stimulate learning interest. The survey indicates that 70% of students expect enhanced exposure to cutting-edge knowledge and value shaping in teaching content.

Fourth, the assessment system requires urgent improvement. The current evaluation over-relies on final exam scores and lacks process-oriented assessment of practical application skills and innovative thinking. This singular focus discourages students' initiative for self-directed learning.

Finally, a significant disconnect exists between theoretical instruction and practical application. Although students grasp fundamental theories, they struggle to effectively transfer and apply this knowledge in complex management scenarios, posing a serious challenge to achieving the goal of applying learning to practice.

The systematic resolution of these challenges is crucial for advancing curriculum reform.

3. Construction of a 5E-Based Curriculum Teaching Ecosystem Model

Centered on student development and the "Three-Wide Education" philosophy, and grounded in the dual theoretical foundations of constructivist learning theory and PDCA cycle management theory, a digital ecosystem for the "Management Accounting" course has been constructed, with the 5E instructional model at its core. The construction logic of this system follows the closed-loop design principle of "theoretical guidance, element integration, and dynamic optimization," aiming to address core challenges in traditional teaching such as fragmentation, superficiality, and one-way knowledge transmission, thereby achieving a fundamental transformation of the teaching paradigm.

At the theoretical level, constructivist learning theory ensures the central role of students in the teaching process, emphasizing the active construction of knowledge in authentic contexts. The PDCA cycle theory provides methodological support for the continuous improvement of the teaching process, forming a virtuous cycle mechanism of "Plan-Do-Check-Act." The two theories complement each other: the former establishes the "learning-centered" teaching philosophy, while the latter provides an operational framework and actionable guide for ensuring the continuous enhancement of teaching quality.

At the system architecture level, this course innovatively integrates the five phases of the 5E instructional model-Engage, Explore, Explain, Exchange, and Evaluate-with the digital teaching environment, forming a teaching ecosystem comprising five key elements: resources, guidance, design, methods, and feedback, which is shown in Figure 1. This system exhibits the following distinctive features:

First, the system achieves a deep integration of online smart learning platforms and offline physical classrooms, breaking the temporal and spatial constraints of traditional teaching. Through pre-class learning analytics and personalized resource, in-class interactive discussions and real-time feedback, and post-class extended learning and continuous tracking, a full-cycle, multi-dimensional learning support system is constructed. For example, in the cost behavior analysis unit of "Management Accounting," micro-lecture videos and guiding questions are pushed via the platform before class; during class, online collaboration tools are used for group hands-on cost breakdown exercises; after class, real industry case reports are pushed through the platform as extensions, thereby extending learning beyond the classroom.

Second, the system establishes a dynamically optimized feedback mechanism. Leveraging the data collection and analysis capabilities of the smart learning platform, it implements an interconnected assessment pathway of "pre-feedback, mid-feedback, and post-feedback," enabling precise understanding of student learning status, timely adjustment of teaching strategies, and ensuring continuous improvement of teaching effectiveness. Specifically, the system can track student behavioral data on the platform, such as video completion rates, exercise accuracy rates, and discussion forum participation quality, and generate personalized learning reports. Based on this, teachers can implement targeted interventions-for instance, automatically pushing supplementary learning materials or organizing online Q&A sessions for student groups with quiz pass rates below 70% in the "Explain" phase.

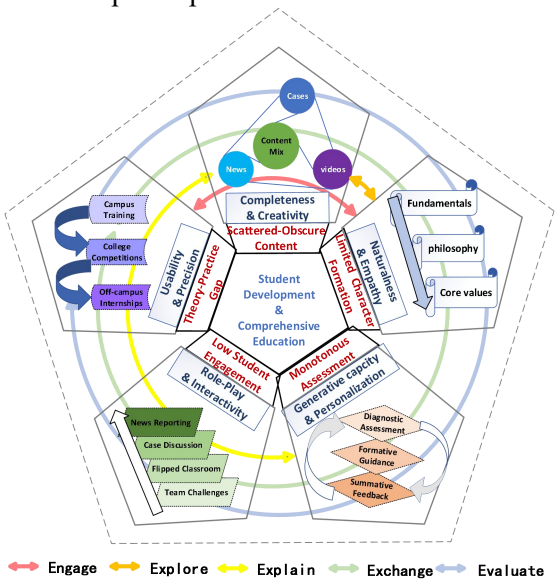

Figure 1. Framework of the Course Teaching Ecosystem

Finally, the system emphasizes synergistic effects among all elements. The five teaching phases are interlocked and mutually supportive, forming a complete learning closed loop from interest stimulation to competency transfer, effectively promoting the organic unity of knowledge impartation, ability cultivation, and value shaping. Taking the "Cost-Volume-Profit Analysis" project as an example, the system

sparks interest through a real-world business dilemma (Engage); guides students to independently collect data and build models (Explore); summarizes patterns under teacher guidance (Explain); applies the model to new business scenarios for decision-making (Exchange); and finally completes value internalization and competency certification through a comprehensive report and peer assessment (Evaluate). This closed loop ensures that students receive corresponding support and challenges at each stage of higher-order cognition, ultimately achieving the teaching goal of integrating knowledge with practice.

4. Exploration of the Course Teaching Implementation Pathway

Based on the constructed course ecosystem, this course has developed an operable teaching implementation pathway, which is concretely reflected in the five phases of the 5E instructional model:

In the Full-Cycle Interest Stimulation (Engage) phase, the course employs multi-dimensional engagement strategies. Through a 20-dimensional learning analytics survey at the beginning of the semester, it accurately identifies students' knowledge base, learning styles, and career development needs. Elaborately designed gamified teaching methods are used, such as the "Cost Control Master" role-playing activity where students, grouped as department heads, achieve quarterly profit targets with limited resources through 10 rounds of decision-making simulations, experiencing the practical value of management accounting tools. A real-time communication system including instant messaging and voice discussion forums, along with a digital gallery for showcasing work, is established. Weekly selections for the "Best Analysis Report" with credit rewards continuously strengthen student motivation.

In the Independent Inquiry and Deepening (Explore) phase, the course designs tiered inquiry tasks at basic, intermediate, and challenging levels. A self-directed inquiry task list containing 12 themes is distributed via the smart learning platform, guiding students in problem-based learning using real business issues, such as "Diagnosing the Causes of Cost Overruns in a Manufacturing Enterprise." Structured group discussions and debate activities are organized, employing Oxford-style debate rules on topics like "Activity-Based Costing vs. Traditional Costing: Advantages and Disadvantages," systematically cultivating students' critical thinking skills. The innovatively introduced "Students Present the News" activity requires student groups to select recent reports from media like Caijing and CBNweekly weekly, creating 15-minute micro-lessons combining management accounting theory with current hot topics like Country Garden's debt crisis or CATL's cost control, achieving a natural integration of value guidance.

In the Knowledge Internalization and Extension (Explain) phase, the course implements differentiated teaching strategies based on classification and tiering. A knowledge point difficulty map is created, categorizing 86 core knowledge points into basic (45), key (30), and difficult (11) types, taught respectively using methods like dynamic chart demonstrations, Harvard Business School case analyses, and the flipped classroom. Visualization tools like Power BI and displays of causal logic chains help students construct a systematic knowledge network connecting "Cost Behavior - CVP Analysis - Budgeting." Utilizing tools like XMind mind maps and custom knowledge graphs, exercises on knowledge relevance are set, requiring students to identify 15 internal connections between seemingly unrelated concepts, facilitating the integration of knowledge from points to a comprehensive framework.

In the Contextual Transfer and Expansion (Exchange) phase, the course builds a three-tier practical platform encompassing basic operations, comprehensive application, and innovative practice. Using the on-campus simulation training center equipped with the Youdao U8 system, students apply management accounting tools like CVP analysis and flexible budgeting within a simulated 6-month business operating cycle. Participation in 5 professional competitions such as the "National University Student Management Accounting Case Competition" is organized, accompanied by 2 months of pre-competition training with corporate mentors to develop students' teamwork and practical skills. Leveraging partnerships with 12 renowned companies like PwC and Haier, internship opportunities involving job rotation during winter and summer vacations are provided, requiring students to complete internship reports with 30 assessment points, promoting the deep integration of theory and

practice.

In the Comprehensive Evaluation and Feedback (Evaluate) phase, the course establishes a process-oriented evaluation system that runs throughout the instruction. "Pre-feedback" guidance is achieved through adaptive quizzes before class, dynamically adjusting teaching focus based on preparation results. "Mid-feedback" adjustment occurs during class via classroom response systems, collecting comprehension data every 15 minutes. "Post-feedback" review is conducted after class using a diversified evaluation matrix comprising self-assessment (20%), peer assessment (30%), and teacher evaluation (50%). This assessment system, with its 28 process assessment points, focuses not only on final exam results but also on the quality of participation in each teaching segment, providing continuous data support for teaching optimization. Semester data shows this system increased students' knowledge retention rate from the traditional 45% to 78% and improved practical skills scores by 32%. names and affiliations are to be centered beneath the title and printed in Times New Roman 11-point, non-boldface type. (See example below)

5. Conclusion

Based on constructivist learning theory and the PDCA cycle management theory, this study has developed an innovative course ecosystem. The core of this system lies in the deep integration of the 5E instructional phases with a digital environment, forming a teaching architecture where five elements-resources, guidance, design, methods, and feedback-operate in synergy. Specifically, the resource element enables dynamic adjustment and personalized of teaching content through the smart learning platform; the guidance element provides students with precise learning path recommendations supported by learning analytics technology; the design element ensures close alignment between teaching activities and learning objectives; the method element combines multiple strategies such as case-based teaching and project-based learning; and the feedback element establishes a developmental assessment mechanism that encompasses the entire process and multiple dimensions.

In terms of the application pathway, the system relies on the closed-loop design of "Engage, Explore, Explain, Exchange, Evaluate" to construct a complete teaching process. In the Engage phase, authentic business scenarios are used to stimulate learning interest; the Explore phase guides students in problem-based independent exploration; the Explain phase promotes the systematic construction of knowledge; the Exchange phase focuses on applying what has been learned to complex business situations; and the Evaluate phase employs diversified assessment methods, achieving comprehensive tracking from knowledge acquisition to ability development. This design not only breaks the temporal and spatial constraints of traditional teaching but also, through the organic linkage of online and offline activities, forms a new teaching paradigm characterized by dynamic optimization.

Practice has shown that this ecosystem effectively enhances student classroom engagement (increased by 25% compared to traditional teaching models) and knowledge application skills (the quality of completion of enterprise practical tasks improved by 32%). Particularly in core chapters such as cost control and budget management, students significantly improved their ability to translate theoretical knowledge into practical decision-making by simulating enterprise operational scenarios. Additionally, the built-in real-time feedback mechanism allows teachers to adjust teaching strategies promptly based on learning data, ensuring continuous improvement in teaching effectiveness.

Future research will further explore the in-depth application of intelligent teaching scenarios, including AI-driven personalized learning path recommendations, the refinement of virtual simulation experiment platforms, and the construction of big data-driven teaching quality monitoring systems. Simultaneously, efforts will continue to optimize the operational mechanisms of the course ecosystem, expand industry-academia cooperation resources, strengthen interdisciplinary integration, and provide more comprehensive support for cultivating management accounting talent that meets the requirements of the digital economy era.

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